NFPA 1581

Standard on Fire Department Infection Control Program

2005 Edition

NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

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NFPA 1581

Standard on

Fire Department Infection Control Program

2005 Edition

This edition of NFPA 1581, *Standard on Fire Department Infection Control Program*, was prepared by the Technical Committee on Fire Service Occupational Safety and Health and acted on by NFPA at its November Association Technical Meeting held November 13–17, 2004, in Miami Beach, FL. It was issued by the Standards Council on January 14, 2005, with an effective date of February 7, 2005, and supersedes all previous editions.

This edition of NFPA 1581 was approved as an American National Standard on February 7, 2005.

Origin and Development of NFPA 1581

In many fire departments, the majority of responses are emergency medical service (EMS)-related. The need for a proactive infection control policy and program is paramount in working in this environment, as members come in contact with potentially infectious victims or other persons in both emergency and nonemergency settings. It is also crucial that those fire departments that do not provide emergency medical services have a proactive infection control program. Given the variety of situations that fire departments are called to, including domestic violence, hazardous materials releases, and even routine structural fires, the potential for infection of a fire department member exists.

This document was developed to provide requirements for infection control practices. The requirements were developed to be compatible with guidelines and regulations from the U.S. Centers for Disease Control (CDC) and the U.S. Department of Health and Human Services that apply to public safety and emergency response personnel. The first edition of the document was issued in 1992.

In the 1995 edition, revisions addressed decontamination of equipment and apparatus, clean areas for equipment to be stored, and living quarters for personnel, as well as the relationship of these subject areas to the overall health and safety of members.

In the 2000 edition, CDC requirements, the relationship with the medical control facility, recordkeeping requirements, and information on disease information for emergency responders were updated.

This edition is a complete revision to reorganize the document in compliance with the *Manual of Style for NFPA Technical Committee Documents*. Information on immunizations and infectious diseases was updated and material on members that decline immunization was moved from the annex to become requirements. The chapter on fire department apparatus was rewritten to use the term "vehicles used to transport patients" rather than the term "ambulance" and appropriate requirements previously referenced to GSA Federal Specification KKK-A-1822E were included in the standard. The table of disease information for emergency response personnel was updated to include some of the bioterrorism agents.

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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.

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Contents

Chapter 1 Administration **1581–** 5
1.1 Scope **1581–** 5
1.2 Purpose **1581–** 5
1.3 Application **1581–** 5
1.4 Equivalency **1581–** 5

Chapter 2 Referenced Publications **1581–** 5
2.1 General **1581–** 5
2.2 NFPA Publications **1581–** 5
2.3 Other Publications **1581–** 5

Chapter 3 Definitions **1581–** 5
3.1 General **1581–** 5
3.2 NFPA Official Definitions **1581–** 5
3.3 General Definitions **1581–** 6

Chapter 4 Program Components **1581–** 7
4.1 Policy **1581–** 7
4.2 Risk Management **1581–** 8
4.3 Training and Education **1581–** 8
4.4 Infection Control Officer **1581–** 8
4.5 Health Maintenance **1581–** 8
4.6 Exposure Incidents **1581–** 9

Chapter 5 Fire Department Facilities **1581–** 9
5.1 General **1581–** 9
5.2 Kitchen Areas **1581–** 9
5.3 Sleeping Areas **1581–**10
5.4 Bathrooms **1581–**10
5.5 Laundry Areas **1581–**10
5.6 Equipment Storage Areas **1581–**10
5.7 Cleaning Areas **1581–**10
5.8 Disinfecting Facilities **1581–**10
5.9 Disposal Areas **1581–**11

Chapter 6 Fire Department Apparatus **1581–**11
6.1 General **1581–**11
6.2 Vehicles Used to Transport Patients **1581–**11

Chapter 7 Emergency Medical Operations Protection **1581–**12
7.1 Personnel **1581–**12
7.2 Personal Protective Equipment **1581–**12
7.3 Handling of Sharp Objects **1581–**12

Chapter 8 Cleaning, Disinfecting, and Disposal **1581–**12
8.1 Skin Washing **1581–**12
8.2 Disinfectants **1581–**13
8.3 Emergency Medical Equipment **1581–**13
8.4 Clothing and Personal Protective Equipment **1581–**13
8.5 Disposal of Materials **1581–**14
8.6 Linen **1581–**14
8.7 Housekeeping **1581–**14
8.8 Labeling **1581–**14

Annex A Explanatory Material **1581–**15

Annex B Sample Policy Statements **1581–**21

Annex C Disinfection and Sterilization Methods **1581–**22

Annex D Informational References **1581–**23

Index **1581–**25

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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 mandatory extracts are given in Chapter 2 and those for nonmandatory extracts are given in Annex D. 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 D.

Chapter 1 Administration

1.1 Scope. This standard contains minimum requirements for a fire department infection control program.

1.2 Purpose. The purpose of this standard is to provide minimum criteria for infection control in the fire station, in the fire apparatus, during procedures at an incident scene, and at any other area where fire department members are involved in routine or emergency operations.

1.3 Application.

1.3.1 These requirements apply to organizations providing fire suppression, rescue, emergency medical care, and other emergency services, including public, military, private, and industrial fire departments.

1.3.2 This standard does not apply to industrial fire brigades that also can 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 requirements of this standard are intended to meet or exceed applicable federal regulations of the Occupational Safety and Health Administration (OSHA) and guidelines of the U.S. Centers for Disease Control (CDC).

1.4.2 The requirements in this standard are designed to provide minimum levels of protection from infection for members and patients, and for the public at fire department facilities.

1.4.3 Nothing herein is intended to restrict any jurisdiction from exceeding these minimum requirements.

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 1500, *Standard on Fire Department Occupational Safety and Health Program,* 2002 edition.

NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments,* 2003 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 1971, *Standard on Protective Ensemble for Structural Fire Fighting,* 2000 edition.

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

2.3 Other Publications.

2.3.1 USFA Publication. U.S. Fire Administration Publications Office, 16825 South Seton Avenue, Emmitsburg, MD 21727.

Publication FA-112, *Guide to Managing an Emergency Service Infection Control Program,* January 2002).

2.3.2 U.S. Government Publications. U.S. Government Printing Office, Superintendent of Documents, Washington, DC 20402.

Federal Motor Vehicle Safety Standard No. 302, *Flammability of Interior Materials.*

Title 29, Code of Federal Regulations, Part 1910.134, "Respiratory Protection."

Title 29, Code of Federal Regulations, Part 1910.1020, "Access to Employee Exposure and Medical Records."

Title 29, Code of Federal Regulations, Part 1910.1030, "Bloodborne Pathogens."

U.S. General Services Administration, Federal Specification KKK-A-1822E, *Star-of-Life Ambulance*, June 1, 2002.

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 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

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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.

3.2.5 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.3* General Definitions.

3.3.1 Blood. Human blood, human blood components, and products made from human blood.

3.3.2 Body Fluids. Fluids that the body produces including, but not limited to, blood, semen, mucus, feces, urine, vaginal secretions, breast milk, amniotic fluids, cerebrospinal fluid, synovial fluid, pericardial fluid, sputum, and any other fluids that might contain pathogens.

3.3.3 Cleaning. The physical removal of dirt and debris, which generally is accomplished with soap and water and physical scrubbing.

3.3.4 Cleaning Gloves. Multipurpose, multi-use gloves that provide limited protection from abrasion, cuts, snags, and punctures during cleaning and that are designed to provide a barrier against body fluids, cleaning fluids, and disinfectants.

3.3.5 Contaminated. The presence or the reasonably anticipated presence of blood, body fluids, or other potentially infectious materials on an item or surface.

3.3.6 Contaminated Sharps. Any contaminated object that can penetrate the skin including, but not limited to, needles, lancets, scalpels, broken glass, jagged metal, or other debris.

3.3.7 Decontamination. The use of physical or chemical means to remove, inactivate, or destroy bloodborne, airborne, or foodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

3.3.8* Disinfection. The process used to inactivate virtually all recognized pathogenic microorganisms but not necessarily all microbial forms, such as bacterial endospore.

3.3.9 Emergency Medical Care. The provision of treatment to patients, including first aid, cardiopulmonary resuscitation, basic life support (first responder or EMT level), advanced life support (paramedic level), and other medical procedures that occur prior to arrival at a hospital or other health care facility.

3.3.10 Emergency Medical Operation. Delivery of emergency medical care and transportation prior to arrival at a hospital or other health care facility.

3.3.11* Engineering Controls. Physical features or mechanical processes within fixed facilities or vehicles that are implemented to improve efficiency, safety, or comfort associated with their operation or use.

3.3.12 Environmental Surface. Interior patient care areas, both stationary and in vehicles, and other surfaces not designed for intrusive contact with the patient or contact with mucosal tissue.

3.3.13 Exposure Incident. A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood, body fluids, or other potentially infectious material; inhalation of airborne pathogens; or ingestion of foodborne pathogens or toxins.

3.3.14 Eyewear. See 3.3.53, Splash-Resistant Eyewear.

3.3.15* Face Protection Devices. Devices constructed of protective materials, designed and configured to cover part or all of the wearer's face or head.

3.3.16 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]

3.3.17 Fire Department. An organization providing rescue, fire suppression, and related activities, including any public, governmental, private, industrial, or military organization engaging in this type of activity. [**1002**, 1998]

3.3.18* Fire Department Facility. Any building or area owned, operated, occupied, or used by a fire department on a routine basis. [**1500**, 2002]

3.3.19 Fire Department Member. See 3.3.37, Member.

3.3.20 Fluid-Resistant Clothing. Clothing worn for the purpose of isolating parts of the wearer's body from contact with body fluids.

3.3.21 Garment. The coat, trouser, or coverall elements of the protective ensemble designed to provide minimum protection to the upper and lower torso, arms, and legs, excluding the head, hands, and feet. [**1851**, 2001]

3.3.22 Handwashing Facility. A facility providing an adequate supply of running potable water, soap, and single-use towels or hot-air drying machines.

3.3.23* 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. [**1500**, 2002]

3.3.24 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. [**1500**, 2002]

3.3.25 Hepatitis.

3.3.25.1 ***HBV.*** Hepatitis B virus.

3.3.25.2 ***HCV.*** Hepatitis C Virus.

3.3.26 HIV. Human immunodeficiency virus.

3.3.27 Immunization. The process or procedure by which a person is rendered immune.

3.3.28* Industrial Fire Department. An organization providing rescue, fire suppression, and related activities as well as emergency medical services, hazardous material operations, or other activities that occur at a single facility or facilities under the same management. [**1500**, 2002]

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3.3.29 Infection. The state or condition in which the body or a part of it is invaded by a pathogenic agent (microorganism or virus) which, under favorable conditions, multiplies and produces effects which are injurious.

3.3.30 Infection Control Officer. The person or persons within the fire department who are responsible for managing the department infection control program and for coordinating efforts surrounding the investigation of an exposure.

3.3.31* 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. [**1500**, 2002]

3.3.32* Kitchen. An area designated for storage, preparation, cooking, and serving of food for members.

3.3.33 Leakproof Bags. Bags that are sufficiently sturdy to prevent tearing or breaking and can be sealed securely to prevent leakage and that are red in color or display the universal biohazard symbol.

3.3.34 Mask. A device designed to limit exposure of the nasal, oral, respiratory, or mucosal membranes to airborne pathogens.

3.3.35* Medical Gloves. Single-use patient examination gloves that are designed to provide a barrier against body fluids.

3.3.36 Medical Waste. Items to be disposed of that have been contaminated with human waste, blood, or body fluids, or human waste, human tissue, blood, or body fluids for which special handling precautions are necessary.

3.3.37* Member. A person involved in performing the duties and responsibilities of a fire department under the auspices of the organization. [**1500**, 2002]

3.3.38 Mucous Membrane. A moist layer of tissue that lines the mouth, eyes, nostrils, vagina, anus, or urethra.

3.3.39 Needle. A slender, usually sharp, pointed instrument used for puncturing tissues, suturing, drawing blood, or passing a ligature around a vessel.

3.3.40 Occupational Exposure. An exposure incident that resulted from performance of a member's duties.

3.3.41 Parenteral. Piercing of the mucous membranes or the skin barrier due to such events as needle sticks, human bites, cuts, and abrasions.

3.3.42 Pathogens. Microorganisms such as a bacteria, virus, or fungus that is capable of causing disease.

3.3.42.1* *Airborne Pathogens.* Microorganisms that can produce infection and/or cause disease in humans after being inhaled.

3.3.42.2* *Bloodborne Pathogens.* Microorganisms that are present in human blood and can cause diseases in humans.

3.3.42.3* *Foodborne Pathogens.* Microorganisms that are present in food or drinking water and can cause infection and/or disease in humans.

3.3.43 Patient. An individual, living or dead, whose body fluids, tissues, or organs could be a source of exposure to the member.

3.3.44* Personal Protective Equipment (PPE). Specialized clothing or equipment worn by a member for protection against a hazard.

3.3.45 Pocket Mask. A double-lumen device that is portable, pocket-size, and designed to protect the emergency care provider from direct contact with the mouth/lips or body fluids of a patient while performing artificial respiration.

3.3.46 Post-Exposure Prophylaxis. Administration of a medication to prevent development of an infectious disease following known or suspected exposure to that disease.

3.3.47 Potentially Infectious Materials. Any body fluid that is visibly contaminated with blood; all body fluids in situations where it is difficult or impossible to differentiate between body fluids; sputum, saliva, and other respiratory secretions; and any unfixed tissue or organ from a living or dead human.

3.3.48 Regulated Waste. Liquid or semi-liquid blood, body fluids, or other potentially infectious materials; contaminated items that would release blood, body fluids, or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood, body fluids, or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood, body fluids, or other potentially infectious materials.

3.3.49 Resuscitation Equipment. Respiratory assist devices such as bag-valve masks, oxygen demand valve resuscitators, pocket masks, and other ventilation devices that are designed to provide artificial respiration or assist with ventilation of a patient.

3.3.50 Risk. A measure of the probability and severity of adverse effects that result from an exposure to a hazard. [**1451**, 2001]

3.3.51 Sharps Containers. Containers that are closable, puncture-resistant, disposable, and leakproof on the sides and bottom; red in color or display the universal biohazard symbol; and designed to store sharp objects after use.

3.3.52 Source Individual. Any individual, living or dead, whose blood, body fluids, or other potentially infectious materials has been a source of occupational exposure to a member.

3.3.53 Splash-Resistant Eyewear. Safety glasses, prescription eyewear with protective side shields, goggles, or chin-length face shields that, when worn properly, provide limited protection against splashes, spray, spatters, or droplets of body fluids. [**1999**, 2003] *(See also 3.3.15.)*

3.3.54* Sterilization. The use of a physical or chemical procedure to destroy all microbial life, including highly resistant bacterial endospores.

3.3.55 Structural Fire-Fighting Gloves. An element of the protective ensemble designed to provide minimum protection to the fingers, thumb, hand, and wrist.

3.3.56* Universal Precautions. An approach to infection control in which human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Chapter 4 Program Components

4.1 Policy.

4.1.1 The fire department shall have a written infection control policy with the goal of identifying and limiting the exposure of members to infection during the performance of their assigned duties and within the fire department working and living environment (*see Annex B*).

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4.1.2 As part of the overall fire department safety and health program, the fire department shall implement an infection control program that meets the requirements of this standard.

4.1.3 The fire department shall provide for the cleaning and disinfection or disposal of the following:

(1) Personal protective equipment (PPE)
(2) Structural fire-fighting protective equipment
(3) Station/work uniforms
(4) Other clothing, if utilized as PPE
(5) Emergency medical equipment
(6)*Apparatus and vehicles

4.2* Risk Management.

4.2.1* The fire department shall incorporate infection control in the written risk management plan that meets the requirements specified in NFPA 1500.

4.2.2 The written risk management plan shall include the identification, evaluation, control, and monitoring of risks to the following:

(1) Fire department facilities
(2) Fire department vehicles
(3) Emergency medical operations
(4) Members when cleaning and disinfecting protective clothing and equipment
(5) Members from other situations that could result in occupational exposure to a communicable disease

4.3 Training and Education.

4.3.1* The fire department shall conduct initial and annual training and education programs for all members in accordance with state, provincial, or federal regulations.

4.3.2 The training program shall include the following:

(1) Use of PPE
(2) Standard operating procedures for safe work practices in infection control
(3) Methods of disposal of contaminated articles and medical waste
(4) Cleaning and decontamination
(5) Exposure management
(6) Medical follow-up

4.3.3* The education program shall provide information on the epidemiology, modes of transmission, and prevention of infectious diseases.

4.3.4 Members shall be educated in the potential reproductive health risks, to the individual as well as to the fetus, related to infectious diseases.

4.4 Infection Control Officer.

4.4.1 The fire department shall have a designated infection control officer.

4.4.1.1 Additional assistant infection control officers shall be appointed where warranted by the activities, size, or character of the fire department.

4.4.1.2 If the infection control officer is not available, additional assistant infection control officers shall be appointed to ensure coverage.

4.4.1.3 In the absence of the infection control officer and assistant infection control officers, alternate members shall be assigned to perform the duties and responsibilities that need immediate attention, regardless of their positions.

4.4.2 The position of infection control officer shall be full-time or part-time, depending on the size and character of the fire department.

4.4.3* The infection control officer shall be responsible for maintaining a liaison with the fire department physician, the health and safety officer, the infection control representative at health care facilities, and health care regulatory agencies.

4.4.4 When notified of an exposure incident, the infection control officer shall ensure the following:

(1) Notification, verification, treatment, and medical follow-up of members
(2) Documentation of the exposure incident as specified in 4.6.5

4.4.5 The infection control officer shall examine compliance procedures and engineering controls to ensure their effectiveness in accordance with the operational requirements of this standard.

4.4.6 The infection control officer shall be a designated member of the fire department's occupational safety and health committee.

4.4.7 The infection control officer shall be knowledgeable and cognizant of the issues associated with bioterrorism pathogens (e.g., anthrax, smallpox) potentially encountered during the performance of job duties, including, but not limited to, the following (*see Table A.4.3.3*):

(1) Identification and screening
(2) Immunizations
(3) PPE
(4) Health effects education
(5) Post-exposure management
(6) Post-incident management

4.4.8 The infection control officer shall be knowledgeable and cognizant of the issues associated with emerging infectious diseases (e.g., SARS) potentially encountered during the performance of job duties, including, but not limited to, the following (*see Table A.4.3.3*):

(1) Identification and screening
(2) Immunizations
(3) PPE
(4) Health effects education
(5) Post-exposure management
(6) Post-incident management

4.5 Health Maintenance.

4.5.1 Immunizations and Infectious Disease Screening.

4.5.1.1 The following infectious disease immunizations or infectious disease screening shall be provided, as indicated:

(1) Tuberculosis screen (PPD) (annually or more frequently according to CDC guidelines) unless member has a history of positive PPD
(2) Hepatitis C virus screen (baseline and following occupational exposure)
(3) Hepatitis B virus vaccinations and titers (as specified in CDC guidelines)

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(4) Tetanus/diphtheria vaccine (booster every 10 years)
(5) Measles, mumps, rubella (MMR) vaccine
(6) Polio vaccine
(7) Hepatitis A vaccine offered to high-risk personnel (HazMat, USAR, and SCUBA) and other personnel with frequent or expected exposures to contaminated water
(8) Varicella vaccine offered to all nonimmune personnel
(9) Influenza vaccine offered to all personnel annually
(10) HIV screening available to all personnel
(11) HIV testing offered on a confidential basis as part of post-exposure protocols and as requested by the physician or member

4.5.1.1.1 If a member has a positive PPD by history, CDC guidelines for management and subsequent chest radiographic surveillance shall be followed.

4.5.1.1.2 All results from HIV tests shall be provided directly to the member, shall be maintained by the physician as confidential documents, and shall not be forwarded to any local, state, provincial, national, or international database unless mandated by public health statute.

4.5.1.2 All members shall be immunized against infectious diseases as required by the authority having jurisdiction and by 29 CFR 1910.1030, "Bloodborne Pathogens."

4.5.1.3 The fire department physician shall ensure that each member is offered currently recommended immunizations at no cost to the member.

4.5.1.4 Members who choose to decline immunizations offered by the department shall be required to sign a written declination.

4.5.1.4.1 The declination shall become part of the member's confidential health data base as specified in Section 10.4 of NFPA 1500.

4.5.1.4.2 Members shall be allowed to recant their declinations at any time and receive the offered immunizations.

4.5.2 In the event of any real or perceived occupational exposure, the member shall receive a confidential medical evaluation and be offered post-exposure prophylaxis where medically indicated, counseling, and evaluation of the reported illness by the fire department physician or the physician's designee.

4.5.3 A confidential health data base shall be established and maintained for each member.

4.5.4 Any exposures shall become part of a member's confidential health data base as specified in NFPA 1582 and in accordance with 29 CFR 1910.1020, "Access to Employee Exposure and Medical Records."

4.6 Exposure Incidents.

4.6.1 If a member experiences an exposure incident, the exposed area shall be immediately and thoroughly washed using water on mucosal surfaces and soap and running water on skin surfaces.

4.6.2 If soap and running water are not available, waterless soap, antiseptic wipes, alcohol, or other skin cleaning agents that do not need running water shall be used until soap and running water are obtained.

4.6.3 The fire department shall have an established procedure and shall train in that procedure to ensure that when a member experiences an exposure incident, the immediate supervisor is notified and the member seeks immediate medical evaluation.

4.6.4* The fire department shall ensure that a member who has experienced an exposure incident receives the following:

(1) Immediate medical guidance, evaluation, and, where appropriate, post-exposure prophylaxis
(2) Appropriate, confidential, post-exposure counseling and testing

4.6.5* All exposure incidents shall be recorded in writing as soon as possible after the incident using a standardized form designed to allow for follow-up.

4.6.5.1 The record shall include the following:

(1) Description of the tasks being performed when the exposure incident occurred
(2) Source of transmission including any relevant medical and social history
(3) Portal of entry
(4) PPE utilized
(5) Disposition of medical management

4.6.5.2 The record of exposure incidents shall become part of the member's confidential health data base as specified in Chapter 10 of NFPA 1500.

4.6.6 A complete record of the member's exposure incidents shall be available to the member upon request.

4.6.7 Exposure incident data, without personal identifiers, also shall be added to the fire department health data base as specified in Chapter 10 of NFPA 1500.

4.6.8 Due to the hazardous nature of some communicable diseases, a member shall be required to report to the infection control officer when the member experiences a confirmed exposure incident and is being medically treated or tested due to presenting signs or symptoms.

4.6.9 The fire department physician shall determine fitness-for-duty status after reviewing documentation of a member's exposure.

Chapter 5 Fire Department Facilities

5.1* General. All fire department facilities shall comply with health and infection control laws, regulations, and standards for public use facilities.

5.2 Kitchen Areas.

5.2.1 All food preparation surfaces and all surfaces directly used for holding or hanging food preparation containers and utensils shall be of a nonporous material.

5.2.2 Shelving Above Sinks.

5.2.2.1 Shelving shall be provided above sinks to drip-dry cleaned food preparation containers.

5.2.2.2 All drainage from shelving shall run into a sink or drainage pan that empties directly into a sanitary sewer system or septic system.

5.2.3 All kitchens shall have either double-basin sinks or two sinks.

5.2.3.1 A sprayer attachment shall be provided.

5.2.3.2 Sinks, adjacent countertops and dish drainage areas, and splash guards around the sink shall be of a nonporous material.

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5.2.4* Kitchens in fire department facilities shall include the following appliances:

(1) Range
(2) Oven
(3) At least one refrigerator
(4) Dishwasher

5.2.5 Food Storage.

5.2.5.1 Perishable food that needs cold storage shall be kept at a temperature of 3°C (38°F) or lower.

5.2.5.2 Perishable food that needs freezer storage shall be kept at a temperature of –18°C (0°F) or lower.

5.2.5.3 All foods removed from their original manufactured packaging shall be kept in tightly sealed food containers or shall be wrapped with plastic food wrap.

5.2.6 Kitchens equipped with a dishwasher shall be capable of supplying water for washing at 60°C (140°F).

5.2.7 Food preparation and storage areas shall meet local health standards.

5.3 Sleeping Areas.

5.3.1 A minimum of 5.6 m^2 (60 ft^2) of floor space per bed shall be provided in sleeping areas.

5.3.2 Ventilation, heating, and cooling shall be provided in sleeping areas.

5.4 Bathrooms.

5.4.1* Doors, sinks, and other bathroom fixtures shall be designed to prevent or minimize the spread of contaminants.

5.4.2 A clearly visible sign reminding members to wash their hands shall be posted prominently in each bathroom.

5.4.3 Bathrooms shall meet local standards.

5.5 Laundry Areas.

5.5.1* The fire department shall provide for cleaning of the following:

(1) PPE
(2) Station/work uniforms
(3) Structural fire-fighting equipment

5.5.2 Cleaning shall be performed by a cleaning service or fire department facility equipped to handle contaminated clothing.

5.5.3 Where cleaning provided by the fire department is conducted in fire stations, the fire department shall provide at least one washing machine and clothes dryer for the purpose of cleaning PPE and station/work uniforms in the designated cleaning area as specified in Section 5.7.

5.5.4 If structural fire-fighting equipment is to be cleaned at a fire department facility, a separate and dedicated machine for the sole purpose of cleaning structural fire-fighting equipment shall be provided.

5.6 Equipment Storage Areas.

5.6.1* Emergency medical supplies and equipment stored in fire department facilities, other than those stored on vehicles, shall be stored in a dedicated, enclosed area to protect them from temperature degradation, contamination, and other physical damage.

5.6.2 The storage area shall be secured and labeled.

5.6.3 Open and reusable emergency medical supplies and equipment shall not be stored in personal clothing lockers or in areas used for the following:

(1) Food preparation and cooking
(2) Living
(3) Sleeping
(4) Recreation
(5) Personal hygiene, unless physically separated in a locker or room

5.6.4 Potentially Contaminated Personal Protective Equipment.

5.6.4.1 Potentially contaminated personal protective equipment shall be stored in a dedicated, well-ventilated area or room.

5.6.4.2 Potentially contaminated PPE shall not be stored in personal clothing lockers or in areas used for the following:

(1) Food preparation and cooking
(2) Living
(3) Sleeping
(4) Recreation
(5) Personal hygiene

5.6.5 Contaminated Storage.

5.6.5.1 Areas or containers for the temporary storage of contaminated medical supplies or equipment prior to disinfection or disposal shall be separated physically from members in facilities or on vehicles.

5.6.5.2 Such areas or containers shall not be used for any other purpose.

5.7 Cleaning Areas.

5.7.1 A designated cleaning area shall be provided in each fire station for the cleaning of PPE, portable equipment, and other clothing.

5.7.2 The cleaning area shall have ventilation, lighting, and drainage connected to a sanitary sewer system or septic system.

5.7.3 The designated cleaning area shall be physically separate from areas used for the following:

(1) Cleaning of food and cooking utensils
(2) Food preparation
(3) Personal hygiene
(4) Sleeping
(5) Living

5.7.4 The designated cleaning area shall be physically separate from the disinfecting facility and laundry facility.

5.8 Disinfecting Facilities.

5.8.1* Fire departments that provide emergency medical operations shall provide or have access to disinfecting facilities for the cleaning and disinfecting of emergency medical equipment.

5.8.1.1 Medical equipment shall be disinfected at a fire station only where a disinfecting facility that meets the requirements of Section 5.8 is provided.

5.8.1.2 Disinfection shall not be conducted in fire station kitchen, living, sleeping, or personal hygiene areas.

5.8.2 Disinfecting facilities in fire stations shall meet the following requirements:

(1) They shall be lighted.
(2) They shall be vented to the outside environment.

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(3) They shall be fitted with floor drains connected to a sanitary sewer system or septic system.
(4) They shall be designed to prevent contamination of other fire station areas.

5.8.3 Disinfecting facilities shall be equipped with rack shelving of nonporous material.

5.8.3.1 Shelving shall be provided above sinks to drip-dry cleaned equipment.

5.8.3.2 All drainage from shelving shall run into a sink or drainage pan that empties directly into a sanitary sewer system or septic system.

5.9 Disposal Areas.

5.9.1 Medical waste or other regulated waste shall be disposed of in a designated disposal area.

5.9.2 Medical waste or other regulated waste shall not be disposed of in fire station kitchen, living, sleeping, or personal hygiene areas.

5.9.3 The designated disposal area shall be physically separate from areas used for the following:

(1) Food preparation
(2) Cleaning of food and cooking utensils
(3) Personal hygiene
(4) Sleeping
(5) Living

5.9.4 The designated disposal area shall be physically separate from the designated cleaning area and the disinfecting facility.

5.9.5 The designated disposal area shall be secured and labeled.

5.9.6 The designated disposal area and the handling, storage, transportation, and disposal of medical waste or other regulated waste shall comply with all applicable state, provincial, and local laws and regulations.

Chapter 6 Fire Department Apparatus

6.1* General. All fire department vehicles involved in providing any level of emergency medical services (EMS) shall comply with health and infection control laws, regulations, and standards.

6.2 Vehicles Used to Transport Patients. The provisions of Section 6.2 shall apply to all fire department vehicles including, but not limited to, rescue vehicles, ambulances, and nonemergency vehicles that are used to transport patients to or from hospitals or other health care facilities.

6.2.1 All engineering controls directed toward infection control in vehicles used to transport patients shall meet or exceed the relevant criteria contained within the GSA Federal Specifications KKK-A-1822E.

6.2.2 The engineering controls shall include but shall not be limited to those referenced in this NFPA standard.

6.2.3 Engineering controls shall be used to augment but not to replace safe infection control training and practices and appropriate personal protective clothing and equipment, as outlined in this standard and in relevant state, provincial, or federal regulations.

6.2.4* Ventilation.

6.2.4.1 When the vehicle is stationary, ventilation systems shall provide complete ambient air exchanges in both driver and patient compartments at least every 2 minutes.

6.2.4.2 Ventilation within each compartment shall be separately controlled.

6.2.4.3 Fresh air intakes for the ventilation system shall be located toward the front of the vehicle.

6.2.4.4 Exhaust Vents.

6.2.4.4.1 Exhaust vents shall be located on the upper rear of the vehicle unless installed as allowed by 6.2.4.4.2.

6.2.4.4.2 Exhaust vents shall be permitted to be located on the rear lower half of the module/body, provided the vent/device incorporates a reverse flow damper to prevent backdraft and intrusion of vehicle engine exhaust, dust, dirt, or road spray.

6.2.4.5 Ventilation for the patient compartment shall be supplied by the heater–air conditioner or by separate power intake or exhaust ventilation systems.

6.2.5* Ambient Air Filtration. In jurisdictions with potential for airborne pathogen exposure (e.g., CDC criteria for moderate- to high-risk TB transmission), fire department vehicles used to transport patients shall have properly fitted, high-efficiency particle (HEPA) filters integrated into the patient compartment ventilation system.

6.2.6* Vehicle Interior Surfaces. The interior of fire department vehicles used to transport patients shall meet or exceed the requirements of 6.2.6.1 through 6.2.6.6.

6.2.6.1 The interior of the body shall be free of all sharp projections.

6.2.6.2 All hangers or supports for equipment and devices shall be mounted as flush as possible with the surrounding surface.

6.2.6.3 The finish of the entire patient compartment, including interiors of storage cabinets, shall be:

(1) Impervious to soap and water, disinfectants, and mildew
(2) Fire resistant
(3) Compliant with FMVSS 302, *Flammability of Interior Materials*
(4) Easily cleaned and disinfected

6.2.6.4 Carpeting, cloth, and fabrics shall not be used in the construction or finish of the patient compartment.

6.2.6.5 The following shall be comprised of or covered by nonabsorbent, washable material:

(1) Seats
(2) Mounted cushions
(3) Cots
(4) Floors
(5) Counters
(6) Shelves
(7) Bulkheads
(8) Container linings

6.2.6.6* The materials required by 6.2.6.5 shall be physically and chemically inert to detergents and other solvents or solutions used for cleaning or disinfecting, or both, as described in USFA Publication FA-112, *Guide to Managing an Emergency Service Infection Control Program.*

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Chapter 7 Emergency Medical Operations Protection

7.1 Personnel.

7.1.1 Prior to any contacts with patients, members shall cover all areas of abraded, lacerated, chapped, irritated, or otherwise damaged skin with adhesive dressings.

7.1.2* Any member who has skin or mucosal contact with body fluids shall thoroughly wash the exposed area immediately using water or saline on mucosal surfaces and soap and running water on skin surfaces.

7.1.3 If soap and running water are not available, waterless soap, antiseptic wipes, alcohol, or other skin cleaning agents that do not need running water shall be used until soap and running water are obtained.

7.1.4 After removal of any PPE, including gloves, all members shall wash their hands immediately or as soon as feasible.

7.2 Personal Protective Equipment.

7.2.1 Members engaging in any emergency medical care shall don medical gloves prior to initiating such care to protect against the variety of diseases, modes of transmission, and unpredictable nature of the work environment.

7.2.1.1 Medical gloves shall be a standard component of emergency response equipment.

7.2.1.2 Latex-free or powder-free medical gloves shall be provided for members with a latex allergy or for members providing care for a patient with a latex allergy.

7.2.2 Medical gloves shall be removed as soon as possible after the termination of patient care, taking care to avoid skin contact with the glove's exterior surface, and shall be disposed of in accordance with 8.5.5.

7.2.3 Hands shall be washed as specified in Section 8.1 following removal of medical gloves.

7.2.4 All PPE used in emergency medical care shall meet the requirements of NFPA 1999.

7.2.5 PPE used in emergency medical care, including masks, splash-resistant eyewear, medical gloves, and fluid-resistant clothing, shall be present on all fire department vehicles that provide emergency medical operations.

7.2.6 Prior to beginning any emergency medical care, members shall don PPE that meets the requirements of NFPA 1999 and is commensurate with the situation being handled.

7.2.6.1 Masks, splash-resistant eyewear, and fluid-resistant clothing shall be used by members providing treatment during situations involving spurting blood, trauma, childbirth, or other situations where gross contamination is anticipated or possible.

7.2.6.2* Appropriate respiratory protection shall be used during situations involving potential exposures to airborne pathogens.

7.2.7 Resuscitation Equipment.

7.2.7.1 Resuscitation equipment, including pocket masks, shall be available on all fire department vehicles that provide emergency medical operations.

7.2.7.2 The equipment shall be used by members performing airway management.

7.2.8 Structural fire-fighting gloves shall meet the requirements of NFPA 1971.

7.2.9 Structural fire-fighting gloves shall be worn by members in any situation where sharp or rough surfaces or a potentially high heat exposure is likely to be encountered, such as patient extrication.

7.2.10* Medical gloves shall not be worn under structural fire-fighting gloves.

7.2.11 Cleaning gloves shall be reusable, heavy-duty, mid-forearm length, and designed to provide limited protection from abrasions, cuts, snags, and punctures.

7.2.12 Cleaning gloves shall provide a barrier against body fluids, cleaning fluids, and disinfectants.

7.2.13 Cleaning gloves, splash-resistant eyewear, and fluid-resistant clothing shall be worn by members during cleaning or disinfecting of clothing or equipment potentially contaminated during emergency medical operations.

7.2.14 Members shall not eat, drink, smoke, apply cosmetics or lip balm, or handle contact lenses while wearing cleaning gloves.

7.3 Handling of Sharp Objects.

7.3.1 All members shall take precautions during procedures to prevent injuries caused by needles, scalpel blades, and other sharp instruments or devices.

7.3.2 All used sharp objects, such as needles, scalpels, catheter stylets, and other potentially contaminated sharp objects, shall be considered infectious and shall be handled with extraordinary care.

7.3.3 Except for those that are automatic or self-sheathing, needles shall not be manually recapped, bent, or broken.

7.3.4 Following use, all sharp objects shall be placed immediately in sharps containers.

7.3.5 Sharps containers shall be located in all patient transport vehicles and shall be readily available in such items as drug boxes, trauma kits, and IV kits.

Chapter 8 Cleaning, Disinfecting, and Disposal

8.1 Skin Washing.

8.1.1 Hands shall be washed as follows:

(1) After each emergency medical incident
(2) Immediately or as soon as possible after removal of gloves or other PPE
(3) After cleaning and disinfecting emergency medical equipment
(4) After cleaning PPE
(5) After any cleaning function
(6) After using the bathroom
(7) Before and after handling food or cooking and food utensils

8.1.2 Hands and contaminated skin surfaces shall be washed with nonabrasive soap and water by lathering the skin and vigorously rubbing together all lathered surfaces for at least 10 seconds, followed by thorough rinsing under running water.

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8.1.3 Where provision of handwashing facilities is not feasible, appropriate antiseptic hand cleansers in conjunction with clean cloth, paper towels, or antiseptic towelettes shall be used.

8.1.4 Where antiseptic hand cleansers or towelettes are used, hands shall be washed with nonabrasive soap and running water as soon as feasible.

8.2 Disinfectants.

8.2.1 All disinfectants shall be approved by and registered as tuberculocidal with the U.S. Environmental Protection Agency (EPA).

8.2.2 Care shall be taken in the use of all disinfectants.

8.2.2.1 Members shall be aware of the flammability and reactivity of disinfectants and shall follow the manufacturer's instructions.

8.2.2.2 Disinfectants shall be used only with ventilation and while wearing appropriate infection control garments and equipment, including, but not limited to, cleaning gloves, face protection devices, and aprons.

8.2.3 Disinfecting shall take place in the designated disinfecting facility as specified in Section 5.8.

8.3 Emergency Medical Equipment.

8.3.1 Where emergency medical equipment cleaning is performed by members, it shall take place in a designated disinfecting facility as specified in Section 5.8, and appropriate personal protective equipment shall be available, including the following:

(1) Splash-resistant eyewear
(2) Cleaning gloves
(3) Fluid-resistant clothing

8.3.2 Dirty or contaminated emergency medical equipment shall not be cleaned or disinfected in fire station kitchen, living, sleeping, or personal hygiene areas.

8.3.3 Personal protective equipment shall be used wherever there is a potential for exposure to body fluids or potentially infectious material during cleaning or disinfecting.

8.3.4 Prior to cleaning and disinfecting, dirty or contaminated emergency medical equipment shall be stored separately from cleaned and disinfected emergency medical equipment.

8.3.5 Disinfectants meeting the requirements specified in 8.2.1 shall be used in accordance with the manufacturer's instructions.

8.3.6 Dirty or contaminated runoff from emergency medical equipment and cleaning and disinfecting solutions shall be drained into a sanitary sewer system or septic system.

8.3.7 Emergency medical equipment, metal, and electronic equipment shall be cleaned in a manner appropriate for the equipment and then disinfected.

8.3.7.1 Only disinfectants that are chemically compatible with the equipment to be disinfected and that meet the requirements specified in 8.2.1 shall be used.

8.3.7.2 The disinfectant manufacturer's instructions for use shall be followed.

8.3.8 Reusable emergency medical equipment that comes in contact with mucous membranes shall require cleaning and a high-level disinfection or sterilization in accordance with the medical equipment manufacturer's instructions after each use (*see Annex C*).

8.3.9* Environmental surfaces shall be cleaned in a manner appropriate for the surface and then disinfected.

8.3.9.1 Only disinfectants that are chemically compatible with the surface to be disinfected and that meet the requirements specified in 8.2.1 shall be used.

8.3.9.2 The disinfectant manufacturer's instructions for use shall be followed.

8.4 Clothing and Personal Protective Equipment.

8.4.1 Fire Department Role.

8.4.1.1* The fire department shall clean, launder, and dispose of personal protective equipment at no cost to the member.

8.4.1.2 The fire department also shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the member.

8.4.2 If a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) shall be removed immediately or as soon as feasible.

8.4.3 All personal protective equipment shall be removed prior to leaving the work area.

8.4.4 Clothing that is contaminated with body fluids shall be placed in leakproof bags, sealed, and transported for cleaning or disposal.

8.4.5 Contaminated Equipment.

8.4.5.1 Cleaning or disinfecting of contaminated structural fire-fighting clothing, personal protective garments, station/work uniforms, or other clothing shall take place in the area as specified in either Section 5.5 or Section 5.7.

8.4.5.2 The cleaning of contaminated PPE, station/work uniforms, or other clothing shall not be done at home.

8.4.6 Structural Fire-Fighting Protective Clothing.

8.4.6.1* Structural fire-fighting protective clothing, gloves, station/work uniforms, and protective footwear shall be cleaned and dried according to the manufacturer's instructions as needed and at least every 6 months.

8.4.6.2 Chlorine bleach or cleaning agents containing chlorine bleach shall not be used. *(See Annex C, and NFPA 1851.)*

8.4.7 When a garment is contaminated, it shall be cleaned as soon as possible.

8.4.8 When PPE is removed, it shall be placed in a designated area or container for storage until cleaned or disposed of.

8.4.9 Self-contained breathing apparatus (SCBA) cleaning, maintenance, and care shall be in accordance with NFPA 1852.

8.4.9.1 Organizations in the United States shall also comply with 29 CFR 1910.134, Respiratory Protection, Paragraph (h) "Maintenance and Care of Respirators," and Appendix B-2, "Respiratory Cleaning Procedures (Mandatory)."

8.4.9.2 Organizations outside the United States shall also comply with all applicable national, state/provincial, and local regulations.

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8.5* Disposal of Materials.

8.5.1 Sharps containers shall be disposed of in accordance with applicable federal, state, provincial, and local regulations.

8.5.2 Contaminated sharps shall be discarded immediately or as soon as feasible in containers with the following features:

(1) Closable
(2) Puncture-resistant
(3) Leakproof on sides and bottom
(4) Labeled or color-coded in accordance with Section 8.8

8.5.3 During use, containers for contaminated sharps shall meet the following requirements:

(1) They shall be accessible to personnel.
(2) They shall be located as close as is feasible to the immediate area where sharps are used or anticipated to be found.
(3) They shall be maintained upright throughout use.
(4) They shall be replaced routinely and not be allowed to overfill.

8.5.4 Moving Containers.

8.5.4.1 When moving containers of contaminated sharps from the area of use, the containers shall be closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

8.5.4.2 Sharps containers shall be placed in a secondary container if leakage is possible.

8.5.5 The following shall be placed in leakproof bags, sealed, and disposed of as medical waste:

(1) Contaminated disposable medical supplies and equipment
(2) Contaminated disposable PPE
(3) Contaminated wastes

8.5.6 Noncontaminated Waste Collection.

8.5.6.1 Noncontaminated disposable medical supplies and equipment, noncontaminated disposable PPE, and noncontaminated wastes shall be permitted to be collected in closable waste containers and shall be disposed of.

8.5.6.2 Such waste collection containers shall not be located in any fire station kitchen, living, or sleeping area.

8.5.7 Where it has been determined by the infection control officer that it is not possible for nondisposable items to be disinfected, they shall be placed in leakproof bags, sealed, and disposed of as medical waste.

8.6 Linen.

8.6.1 Contaminated laundry shall be handled as little as possible and with a minimum of agitation.

8.6.2 Contaminated laundry shall be bagged or put into containers at the location where used and shall not be sorted or rinsed at the location of use.

8.6.3 Contaminated laundry shall be placed and transported in bags or containers labeled or color-coded in accordance with Section 8.8.

8.6.4 Wherever contaminated laundry is wet and presents a reasonable likelihood of soaking through or leaking from the bag or container, the laundry shall be placed and transported in bags or containers that prevent soak-through or leakage, or both, of fluids to the exterior.

8.6.5 The employer shall ensure that employees who have contact with contaminated laundry wear PPE commensurate with the risk.

8.6.6 Where a fire department ships contaminated laundry to a facility that does not utilize universal precautions in the handling of all laundry, the fire department facility generating the contaminated laundry shall place such laundry in bags or containers labeled or color-coded in accordance with Section 8.8.

8.7 Housekeeping.

8.7.1 Fire Department Role.

8.7.1.1 The fire department shall ensure that the worksite is maintained in a clean and sanitary condition.

8.7.1.2 The fire department shall determine and implement a written schedule for cleaning and method of decontamination based on the following:

(1) Location within the facility
(2) Type of surface to be cleaned
(3) Type of soil present
(4) Tasks or procedures performed

8.7.2 After contact with blood or other potentially infectious materials, equipment and environmental and working surfaces shall be cleaned and decontaminated using any cleaner or disinfectant agent intended for environmental use. Environmental and working surfaces shall include the following:

(1) Floors
(2) Woodwork
(3) Ambulance seats
(4) Countertops

8.7.3 Contaminated work surfaces shall be decontaminated with a disinfectant at the following times:

(1) After completion of emergency medical operations
(2) Immediately or as soon as feasible where surfaces are overtly contaminated
(3) Immediately after any spill of blood or other potentially infectious materials
(4) At the end of the workshift if the surface was possibly contaminated since the last cleaning

8.7.4 All bins, pails, cans, and similar receptacles intended for reuse that have a reasonable likelihood of becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.

8.8 Labeling.

8.8.1 Warning labels shall be affixed to containers of regulated waste and other containers used to store, transport, or ship blood or other potentially infectious materials, such as sharps.

8.8.2 Labels required by Section 8.8 shall include the symbol shown in Figure 8.8.2.

8.8.3 The labels shall be fluorescent orange or orange-red, or predominantly so, with lettering or symbols in a contrasting color.

8.8.4 The labels required shall be affixed as closely as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

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FIGURE 8.8.2 DOT (Department of Transportation) Symbol for Biohazards.

8.8.5 The use of red bags or red containers shall be permitted to be substituted for the use of labels.

8.8.6 Labels required for contaminated equipment shall specify which portions of the equipment remain contaminated.

8.8.7 Regulated waste that has been decontaminated shall not be required to be labeled or color-coded.

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.1.4.1 "Applicable federal regulations of the Occupational Safety and Health Administration" refers specifically to 29 CFR 1910.1030, "Bloodborne Pathogens."

"Guidelines of the Centers for Disease Control and Prevention" refers specifically to *Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health Care and Public Safety Workers.*

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 For a more complete glossary of terms associated with infection control, refer to the U.S. Fire Administration Publication FA-112, *Guide to Managing an Emergency Service Infection Control Program.*

A.3.3.8 Disinfection. Disinfection is not the same as sterilization.

A.3.3.11 Engineering Controls. The engineering controls described in this standard are designed to reduce the risk of occupational exposure to infectious diseases for fire department members.

A.3.3.15 Face Protection Devices. Face protection devices might include splash-resistant eyewear, hooded visors, or respirators.

A.3.3.18 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.3.3.23 Health and Safety Officer. The individual can be the incident safety officer, or it can also be a separate function.

A.3.3.28 Industrial Fire Department. The industrial fire department generally is trained and equipped for specialized operations based on site-specific hazards present at the facilities.

A.3.3.31 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.3.3.32 Kitchen. Cleaning and washing of food service equipment and utensils also occur in this area.

A.3.3.35 Medical Gloves. The requirement for FDA registration of gloves provides further benefit to the emergency responder. Although the FDA currently does not require that medical gloves used in emergency medical response be registered as medical devices, these same gloves, when worn by emergency personnel inside hospitals and other health care facilities, must be registered as Class 1 medical devices.

Although FDA registration is not a certification of the product, it is a process by which the manufacturer is required to provide substantiation for any and all claims made regarding the performance of the product (such as its viral barrier performance, levels of quality assurance, and sterility) in either product packaging or marketing literature. The FDA either affirms or denies these claims.

Therefore, this requirement helps to ensure that fire service and emergency medical service personnel are provided with accurate information about the products they purchase.

A.3.3.37 Member. For the purposes of this standard, a fire department member can be a full-time or part-time employee, can be a paid or unpaid volunteer, can occupy any position or rank within the fire department, and might or might not engage in emergency operations.

A.3.3.42.1 Airborne Pathogens. Some infectious particles naturally persist for long periods in the environment or are weaponized by packaging that causes them to be released in aerosol suspension (e.g., anthrax). This standard is mainly concerned with pathogens that are transmitted from human to human in

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droplets or aerosols of respiratory secretions. Examples of diseases transmitted in this way include, but are not limited to, the following:

(1) Tuberculosis (TB)
(2) Pertussis
(3) Meningococcal disease
(4) Viruses, such as the following:
    (a) Measles
    (b) German measles (rubella)
    (c) Chicken pox (varicella)
    (d) Mumps
    (e) Influenza

A.3.3.42.2 Bloodborne Pathogens. Examples of bloodborne pathogens include human immunodeficiency virus, hepatitis B virus, and hepatitis C virus.

A.3.3.42.3 Foodborne Pathogens. Examples of foodborne pathogens that produce disease through establishment of infection by the ingested microorganisms in the gastrointestinal tract include *salmonella, shigella, campylobacter,* and certain strains of *E. coli*. Infection with these organisms is usually characterized by fever and abdominal pain in addition to the symptoms of gastroenteritis. The onset of symptoms typically occurs 12 to 24 hours after ingestion of the contaminated food. Proper refrigeration inhibits growth of pathogenic microorganisms in food; adequate cooking both kills the microorganisms and destroys their toxins.

Following ingestion of contaminated food, disease can result either from establishment of infection by the microorganisms themselves or from the effects of toxins that had previously been released into the food by the microorganisms.

A.3.3.44 Personal Protective Equipment (PPE). Personal protective equipment for cleaning and disinfecting includes splash-resistant eyewear, cleaning gloves, and fluid-resistant clothing.

A.3.3.54 Sterilization. This procedure typically is not performed at fire department facilities or by members.

A.3.3.56 Universal Precautions. Under circumstances in which differentiation between body fluids is difficult or impossible, all body fluids are considered potentially infectious materials. An infection control strategy that considers all body substances potentially infectious is called *body substance isolation*.

A.4.1.3(6) See NFPA 1901 and NFPA 1500 for additional design and cleaning requirements.

A.4.2 The risk of occupational exposure to a communicable disease poses a real hazard on a daily basis for department members. It is possible for an occupational exposure to a communicable disease to occur during a variety of emergency operations involving delivery of service to the public. Prevention aspects should be properly addressed through a written infection control program.

Infection control should be integrated into the department's overall risk management process. By utilizing the risk management process, risks are identified according to the job tasks performed by department members. Risks should be evaluated based on the frequency and severity of occurrence within the community. Control measures should be implemented based upon the risk evaluation and services performed by the department. A monitoring process evaluates the effectiveness of this program and determines if changes should be made.

Risk management is an ongoing process that should be continually evaluated and revised based on the needs and requirements of the department. The health and safety officer, the infection control officer, and the department's occupational safety and health committee should ensure that evaluations and revisions occur at least annually.

A.4.2.1 The risk to personnel of exposure to infection poses a real hazard and should be properly addressed through a written infection control program that should include, but not be limited to, the following:

(1) Training and education
(2) PPE
(3) Health maintenance and vaccinations
(4) Appropriate supervision
(5) Incident operations
(6) Facility safety
(7) Medical follow-up of an occupational exposure

A.4.3.1 For infectious disease training guidelines, the following should be consulted:

(1) *Infection Control for Emergency Response Personnel: The Supervisor's Role (Student Manual),* U.S. Fire Administration, National Fire Academy
(2) *A Curriculum Guide for Public Safety and Emergency Response Workers, Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus*, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention
(3) *Training for Hazardous Material Response: Infectious Diseases*, International Association of Fire Fighters (IAFF)

A.4.3.3 Table A.4.3.3 summarizes information on the specific diseases/infections that are of greatest concern.

A.4.4.3 The infection control officer needs to maintain contact with any person or agency that has an impact on the fire department infection control program, whether internal, external, local, statewide, provincewide, or nationwide. The officer should also be familiar with Public Law 101-381, *The Ryan White Comprehensive AIDS Resources Emergency* (CARE) Act of 1990, Final Rule.

Networking is a very important part of the infection control program. One resource is the Association for Professionals in Infection Control and Epidemiology (APIC), 1275 K Street, NW, Suite 1000, Washington, DC 20005-4006. This hospital-based organization provides information regarding all components of the infection control program.

An additional source of information is the *Morbidity and Mortality Review* published by CDC. A free e-mail subscription is available on the CDC web site at *www.cdc.gov*.

A.4.6.4 For appropriate post-exposure guidelines, reference should be made to 29 CFR 1910.1030, "Bloodborne Pathogens"; *Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health Care and Public Safety Workers*; and *Guideline for infection control in health care personnel*, by Elizabeth A. Bolyard, et al.

For guidance on post-exposure counseling, reference should be made to "Public Health Service Guidelines for Counseling and Antibody Testing to Prevent HIV Infection and AIDS," *Morbidity and Mortality Weekly Review*, Centers for Disease Control and Prevention.

A.4.6.5 Recordkeeping should be in accordance with the requirements of 29 CFR 1910.1030, "Bloodborne Pathogens." Figure A.4.6.5 is an example of an exposure report form.

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Table A.4.3.3 Disease Information for Emergency Response Personnel

Disease/Infection	Mode of Transmission	Is Vaccine Available?	Signs and Symptoms
AIDS/HIV (human immunodeficiency virus)	Needle stick, blood splash into mucous membranes (e.g., eyes, mouth), blood contact with open wound	No	Fever, night sweats, weight loss, cough
Anthrax	Biowarfare and naturally acquired: spore-contaminated surfaces/material contacting one's skin (cutaneous anthrax), or breathing of spores (inhalation anthrax)	Yes	Cutaneous: progressive skin lesion(s) from papule to vesicle to black eschar
Bioterrorism agents (see anthrax, smallpox, pneumonic plague)			
Chicken pox (see varicella)			
German measles (see rubella)			
Hemorrhagic fevers	Inhalation	No	Fever, bleeding
Hepatitis A, Hepatitis E	Contaminated food/water	Yes	Fever, loss of appetite, jaundice, fatigue
Hepatitis B (HBV)	Needle stick, blood splash into mucous membranes (e.g., eye or mouth), blood contact with open wound; possible exposure during mouth-to-mouth resuscitation	Yes	Fever, fatigue, loss of appetite, nausea, headache, jaundice
Hepatitis C	Same as hepatitis B	No	Same as hepatitis B
Hepatitis D	Same as hepatitis B; dependent on HBV (past or present) to cause infection	No	A complication of HBV infection; can increase severity of HBV infection
Herpes simplex (cold sores)	Contact of mucous membrane with moist lesions; fingers at particular risk for becoming infected	No	Skin lesions located around mouth
Infectious diarrhea: *Campylobacter, Salmonella, Shigella, E. Coli*	Foodborne	No	Fever, diarrhea, vomiting, abdominal pains
Influenza	Respiratory aerosols	Yes	Fever, fatigue, loss of appetite, nausea, headache
Lice: head, body, pubic	Close head-to-head contact; both body and pubic lice require intimate contact (usually sexual) or sharing of intimate clothing	No	Severe itching and scratching, often with secondary infection; scalp and hairy portions of body can be affected; eggs of head lice (nits) attach to hairs as small, round, gray lumps
Measles (see rubella)			
Meningitis: meningococcal	Respiratory aerosols	Yes, but only in extraordinary circumstances	Fever, severe headache, stiff neck, sore throat

Sheet 1 of 2

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Table A.4.3.3 *Continued*

Disease/Infection	Mode of Transmission	Is Vaccine Available?	Signs and Symptoms
Meningitis	Many different causes	No	Fever, severe headache, stiff neck, sore throat
Mononucleosis	Contact with respiratory secretions or saliva, such as with mouth-to-mouth resuscitation	No	Fever, sore throat, fatigue
Mumps (infectious parotitis)	Respiratory aerosols and contact with saliva	Yes	Fever, swelling of salivary glands (parotid)
Pertussis	Direct contact with oral secretions; respiratory aerosols	Yes	Violent cough at night, whooping sound when cough subsides
Pneumonic plague	Biowarfare and naturally acquired: respiratory droplets	No	In general, progressive flu-like symptoms
Rubella	Respiratory aerosols and contact with respiratory secretions	Yes	Fever, rash
SARS	In general, respiratory droplets, but respiratory aerosols need to be considered	No	In general, progressive flu-like symptoms
Shingles (see varicella)			
Smallpox	Biowarfare — respiratory aerosol or cloud (any case should be considered an act of bioterrorism until proven otherwise)	Yes	Flu-like symptoms followed by characteristic rash
Syphilis	Primarily sexual contact; rarely through blood transfusion or contact with skin lesions	No	Genital and cutaneous lesions, nerve degeneration (late)
Tuberculosis, pulmonary	Airborne	No	Fever, night sweats, weight loss, cough
Varicella	Respiratory aerosols and contact with moist vesicles	Yes	Fever, rash, cutaneous vesicles (blisters)
West Nile virus	Arthropod-borne	No	Fever, skin rash with change in mental status
Whooping cough (see pertussis)			

Sheet 2 of 2

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FIRE DEPARTMENT INFECTIOUS EXPOSURE FORM

Exposed member's name: _____ Rank: _____

Soc. Sec. No.: _____

Field Inc. No.: _____ Shift: _____ Company: _____ District: _____

Name of patient: _____ Sex: _____

Age: _____ Address: _____

Suspected or confirmed disease: _____

Transported to: _____

Transported by: _____

Date of exposure: _____ Time of exposure: _____

Type of incident (auto accident, trauma): _____

What were you exposed to?

❑ Blood ❑ Tears ❑ Feces ❑ Urine ❑ Saliva ❑ Vomitus ❑ Sputum ❑ Sweat

❑ Other _____

What part(s) of your body became exposed? Be specific: _____

Did you have any open cuts, sores, or rashes that became exposed? Be specific: _____

How did exposure occur? Be specific: _____

Did you seek medical attention? ❑ yes ❑ no

Where? _____ Date: _____

Contacted infection control officer? Date: _____ Time: _____

Supervisor's signature: _____ Date: _____

Member's signature: _____ Date: _____

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FIGURE A.4.6.5 Sample Exposure Report Form.

A.5.1 State, provincial, and local laws and regulations are usually very specific about infection control standards for public use facilities. Public health agencies provide standards for food storage, preparation, and handling, as well as for disposal of general and medical or other regulated waste. Hotel bureaus sometimes have the ability to provide standards for sleeping areas and bathrooms.

Emergency response agencies can learn important lessons from such state, provincial, and local agencies, which serve as valuable resources in developing standard operating procedures or guidelines for infection control in fire department facilities and in designing or remodeling facilities.

A.5.2.4 Because of the potential for excessive use by a large number of people, commercial-grade appliances are needed in many fire department facilities. Such appliances often have a larger capacity and more durability for continuous or repeated use.

When determining the number of refrigerators needed, consideration should be given to the number of members who are to use a refrigerator or the amount of use the refrigerator is to receive. A large number of people using a small refrigerator results in the door being opened often, causing the refrigerator to lose its ability to maintain a proper temperature and resulting in the spoilage of food or the accumulation of bacteria or other sources of foodborne diseases.

A.5.4.1 Bathrooms are a significant source of infection if they are improperly designed or if members fail to practice proper hygiene, or both.

Bathrooms should have push-to-open doors without handles for egress. Such doors assist in eliminating a place for infectious agents to accumulate and breed. It should not be necessary for users to grasp sink faucets to turn them off or on. If grasping is necessary, users should use a paper towel to turn faucets off after drying their hands.

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Hand-drying materials should be disposable, or an air-drying machine should be available. Such materials or machines decrease the possibility of infectious agents accumulating or breeding on a cloth that is used repeatedly.

The flush valve on toilets and urinals should be of a foot operated or electric eye–type that does not require the use of hands for operation.

A.5.5.1 Commercial models of washers (front-loading) and dryers are recommended to prevent agitator damage to clothing.

A.5.6.1 The intent of this storage requirement is to ensure that emergency medical supplies are located in an area separate from other functional areas to minimize contamination. Temperature-sensitive materials should be stored in accordance with manufacturer's recommendations.

A.5.8.1 Where the fire department provides only emergency medical operations at the first responder level, there should be at least one disinfecting facility available. Where the fire department provides basic life-support or advanced life-support emergency medical operations, there should be a disinfecting facility in each fire station from which such services are provided.

A.6.1 Relevant OSHA standards and CDC airborne pathogen regulations should be referenced.

A.6.2.4 The requirements of 6.2.4 are consistent with the requirements of 3.13.6 of GSA Federal Specification KKK-A-1822E.

A.6.2.5 While TB is a major health concern, it should be pointed out that certain other pathogens are more easily transmitted or potentially dangerous. There is little information on the efficacy of HEPA filters for pathogens other than TB.

A.6.2.6 The requirements of 6.2.6 are consistent with the requirements of 3.10.17 of GSA Federal Specification KKK-A-1822E.

A.6.2.6.6 The following text is from FA-112 and is reproduced here for the information of the user of this standard.

All seats, mounted cushions, cots, floors, counters, shelves, bulkheads, and container linings must be made of or covered by non-absorbent, washable material. These surface materials should be inert to detergents, solutions, and solvents, for disinfecting and cleaning as described by OSHA or CDC.

The fire department must consider engineering controls for proper decontamination and disinfecting when designing new vehicles and apparatus. EMS compartments on fire apparatus and other vehicles should be designed to facilitate easy decontamination and disinfecting in the event contaminated materials are placed in these compartments.

All disinfectants used should be approved and registered with the Environmental Protection Agency (EPA) as tuberculocidal. If a disinfectant is tuberculocidal, it is strong enough to kill all other bacteria and virus of concern. Members using disinfectants must be aware of safety and health precautions such as ventilation, use of appropriate PPE, and flammability and reactivity of the disinfectants. A chlorine bleach solution also can be used to disinfect compartments, hard surfaces, or other areas of a vehicle or apparatus. The CDC's "Recommendations for Prevention of HIV Transmission in Health-Care Settings" states that effective concentrations range from 500 ppm (1:100) to 5,000 ppm (1:10) depending on the amount of organic material present on the surface. Surfaces first should be washed with hot soapy water and then rinsed with clean water so all visible material has been removed. If organic material has been removed by cleaning, the lower concentration of bleach (1:100) appears to be effective. A 1:100 dilution can be attained by mixing approximately two cups of chlorine bleach per gallon of water. The lower concentration is preferable whenever possible because stronger concentrations may corrode or destroy vulnerable metal with continued use. The bleach solution should be prepared daily. Use of commercial disinfectants should follow manufacturers' instructions.

A.7.1.2 If germicidal agents are readily available, they should be used in lieu of soap when washing skin surfaces.

A.7.2.6.2 Air-purifying respirators designed for certain pathogens (such as an N-95 respirator for TB) might not provide adequate protection against aerosolized pathogens. Even when properly chosen for particular pathogens, respirators must still be properly worn and fitted. *(See 29 CFR 1910.134.)*

A.7.2.10 The intent of this requirement is to ensure that members are not unnecessarily injured by melting, dripping, or burning caused by medical gloves worn under structural fire-fighting gloves. It is possible for fire-fighting gloves worn by members to be subjected to high heat without showing any external signs of damage, while the medical gloves degrade inside the fire-fighting glove, causing injury to the fire fighter.

A.8.3.9 A 1:100 dilution of household chlorine bleach (5.25 percent sodium hypochlorite) to water is permitted to be used as a general surface disinfectant; however, it is corrosive to metal and is capable of interfering with the function of electronic equipment. *(See also Annex C.)*

A.8.4.1.1 Clean protective clothing reduces health and safety risks. Clothing should be cleaned frequently to reduce the level of, and bodily contact with, contaminants. User agencies should establish guidelines for frequency and conditions for garment cleaning. For gross contamination with products of combustion, fire debris, or body fluids, removal of contaminants by flushing with water as soon as practical is necessary, followed by appropriate cleaning.

Decontamination is sometimes impossible where personal protective clothing is contaminated with chemical, radiological, or biological agents. Where decontamination is not possible, garments should be discarded in accordance with local, state, provincial, and federal regulations.

A.8.4.6.1 See NFPA 1851 and NFPA 1852. *(See also Annex C.)*

Some components of such garments are inherently flame resistant but lose their physical integrity on exposure to chlorine bleach. Other components actually lose their flame-resistant properties and thermal insulation on exposure to chlorine bleach. In either case, the protection provided by the garment is compromised.

There are industrial cleaning products and facilities available for protective clothing that merit investigation. The manufacturer of protective clothing should be contacted for additional information. Where not explicitly outlined by the manufacturer, the following procedures are recommended for cleaning and disinfecting protective clothing:

(1) Spot cleaning — Precleaners should be used to clean light spots and stains on protective clothing. Precleaner should be squirted once or twice onto the soiled areas. The fabric should be rubbed together gently until a light foam appears on the surface and carefully rinsed off with cool water.
(2) Pretreating — Liquid detergent should be applied directly from the bottle onto the soiled areas. The fabric should be rubbed together gently until a light foam appears on the surface. The garments should be placed into the washing

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machine as specified in A.8.4.6.1(3), and the remaining amount of the recommended detergent should be added.

To clean garments that are heavily soiled, a liquid detergent or precleaner solution should be used in the following manner prior to laundering:

(a) The garment should be air-dried before applying product.
(b) The liquid detergent or precleaner should be squirted directly onto the stain and the surrounding areas (three to four squirts). It should be made certain that the soiled area is soaked with the product.
(c) A soft-bristle brush (toothbrush or fingernail-type brush dipped in water) should be used to scrub the soiled area gently for about 1 minute.
(d) The liquid detergent or precleaner should be reapplied to the soiled areas again (one or two squirts).
(e) The garment should be placed into the washing machine as described in A.8.4.6.1(3).

(3) Washing instructions — Protective clothing should be washed separately from other garments. All hooks and eyes should be fastened, and the garment should be turned inside out or placed in a large laundry bag that is tied shut to avoid damage to the washtub. A stainless steel tub should be utilized if available.

The following instructions should be used for cleaning any of the following wash loads in a large capacity [60 L (16 gal)] top-loading or front-loading washing machine:

(a) One protective coat and one protective trouser
(b) Two protective coats
(c) Two protective trousers

Prior to washing, heavily soiled garments should be pretreated using the procedures outlined in A.8.4.6.1(2). Detailed washing instructions are as follows:

(a) While the washing machine is filling with hot water [49°C to 55°C (120°F to 130°F)], one-half cup [120 mL (4 oz)] of liquid oxygenated bleach (chlorine bleach should not be used) and one cup [240 mL (8 oz)] of liquid detergent should be added. These products are readily available in supermarkets.
(b) The washing machine should be filled to the highest water level.
(c) The garments to be washed should be added.
(d) The washing machine should be set for normal cycle, cotton/white, or similar setting.
(e) The machine should be programmed for double rinse. If the machine does not automatically double rinse, a complete second cycle should be run without adding detergent or oxygenated bleach. Double rinsing helps remove any residual dirt and ensures detergent removal.
(f) The garments should be removed from the washing machine and dried by hanging in a shaded area that receives good cross-ventilation, or they should be hung on a line and a fan should be used to circulate the air. A water extractor can be used.

(4) Laundering and cleaning products — Some examples of products that are permitted to be utilized for cleaning, spot cleaning, and pretreating include the following:

(a) Spot cleaning and pretreating: Liquid Spray and Wash®, Liquid Tide®, Liquid Shout®
(b) Cleaning: Liquid Wisk®, Liquid Cheer®, Liquid Tide®, Liquid Fab®
(c) Oxygenated bleaching: Liquid Clorox 2®, Liquid Vivid®

WARNING: DO NOT USE CHLORINE BLEACH ON FIRE FIGHTER PROTECTIVE CLOTHING

A.8.5 For information regarding management of medical waste or other regulated waste, the following publications should be referenced:

(1) *EPA Guide for Infectious Waste Management,* U.S. Environmental Protection Agency
(2) *Guideline for Environmental Infection Control in Health-Care Facilities*
(3) *Guideline for Hand Hygiene in Health-Care Settings*

Annex B Sample Policy Statements

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

B.1 The examples in this annex are reprinted from the U.S. Fire Administration Publication FA-112, *Guide to Developing an Emergency Service Infection Control Program.*

Example 1: The Fire Department recognizes the potential exposure of its fire fighters, in the performance of their duties, to communicable diseases. To minimize the risk of exposure, the Fire Department will implement an infection control program.

The infection control program will include standard operating procedures, initial training and continuing education in infection control practices, a vaccination program, the provision of proper infection control clothing and equipment, decontamination procedures for clothing and equipment, procedures for the disposal of medical waste, a system for reporting and managing exposures, a system for tracking exposures and ensuring confidentiality, monitoring of compliance with the standard operating procedures, the design of fire department facilities to minimize risk of infection, and a public information campaign.

Finally, exposure to communicable disease shall be considered an occupational health hazard, and any communicable disease contracted as the result of a documented workplace exposure shall be considered occupationally related.

Example 2: The Fire Department recognizes the potential exposure of its members to communicable diseases in the performance of their duties and in the normal work environment. The Fire Department is committed to a program that will reduce this exposure to a minimum and will take whatever measures are feasible to protect the health of its members.

In the emergency care setting, the infectious disease status of patients is frequently unknown by Fire Department personnel. All patients must be considered infectious. Blood and body fluid precautions must be taken with all patients.

To minimize the risk of exposure, the Fire Department will provide its members with proper infection control protective equipment, including disposable medical gloves, face masks, gowns, and eyewear, and will provide necessary cleaning and disinfecting supplies. The Fire Department also will provide initial instruction and continuing education in preventive health care practices so that fire fighters possess a basic awareness of infectious diseases, understand the risks and severity of various types of exposures, and exhibit proper skills in infection control.

Standard prophylactic medical treatment will be given to exposed members, and necessary immunizations will be made available to protect members from potential exposure to infectious disease.

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Infection Control Program Policy Statement

Purpose: To provide a comprehensive infection control system that maximizes protection against communicable diseases for all members and for the public that they serve.

Scope: This policy applies to all members, career and volunteer, providing fire, rescue, or emergency medical services.

This department recognizes that communicable disease exposure is an occupational health hazard. Communicable disease transmission is possible during any aspect of emergency response, including in-station operations. The health and welfare of each member is a joint concern of the member, the chain of command, and this department. Although each member is ultimately responsible for his or her own health, the department recognizes a responsibility to provide as safe a workplace as possible. The goal of this program is to provide all members with the best available protection from occupationally acquired communicable disease.

It is the policy of this department to do the following:

- Provide fire, rescue, and emergency medical services to the public without regard to known or suspected diagnoses of communicable disease in any patient.
- Regard all patient contacts as potentially infectious. Universal precautions will be observed at all times and will be expanded to include all body fluids and other potentially infectious material (body substance isolation).
- Provide all members with the training, immunizations, and personal protective equipment (PPE) needed for protection from communicable diseases.
- Recognize the need for work restrictions based on infection control concerns.
- Encourage participation in member assistance and critical incident stress debriefing (CISD) programs.
- Prohibit discrimination of any member for health reasons, including infection or seroconversion, or both, with HIV, HBV, or HCV.
- Regard all medical information as strictly confidential. No member health information will be released without the signed written consent of the member.

FIGURE B.1 Sample Infection Control Program Policy Statement.

Fire Department members will contact the fire department infection control representative after any actual or suspected exposure to a contagious disease. The infection control representative will contact the hospital to initiate patient follow-up and determine the need for treatment of the exposed individual. A contagious disease exposure tracking system is a component of the medical records system that is maintained for each member.

The Fire Department believes that its members have the right to be fully informed if a patient is found to carry a communicable disease and if a probable exposure occurred. The responsibility for informing the Fire Department should rest with the medical institution receiving the patient and should occur as soon as possible after the medical institution becomes aware of the condition.

The Fire Department also recognizes the health concerns that can be involved in the station work environment, where a number of members share living quarters and work areas and, in some cases, use the same equipment. There is a particular need to isolate this environment from the infectious hazards that members can encounter in providing emergency care to the general public. There is also a need to provide facilities and equipment that do not expose members to additional health risks. This need also extends to preventing the spread of health risks encountered in the work environment to a member's home, family, and friends.

The Fire Department also believes that infectious disease exposure should be considered an occupational health hazard and supports the presumption that contracting a contagious disease should be considered an occupationally related condition.

Therefore, the Fire Department hereby adopts NFPA 1581, *Standard on Fire Department Infection Control Program.*

It is possible that an existing program or policy meets the requirements of this standard; if so, the program or policy might need to be adopted, in whole or in part, in order to comply with this standard. An example of such an existing program or policy is a corporate infection control program or an employee immunization program.

A policy statement provides members with awareness that the department considers infection control to be an important issue.

The written policy statement should define the purpose, scope, and philosophy of the infection control program clearly. See Figure B.1 for a sample of an infection control program policy statement.

Annex C Disinfection and Sterilization Methods

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

C.1 General. The following disinfection and sterilization methods should be used for equipment used in emergency medical operations:

(1) Sterilization
(2) High-level disinfection
(3) Intermediate-level disinfection
(4) Low-level disinfection
(5) Environmental disinfection
(6) Housekeeping

C.2 Sterilization. This method destroys all forms of microbial life, including high numbers of bacterial spores.

C.2.1 Sterilization can be achieved by steam under pressure (autoclave), gas (ethylene oxide), dry heat, or immersion in an EPA-approved chemical sterilant for a prolonged period of time (e.g., 6 to 10 hours) or according to manufacturer's instructions. Liquid chemical sterilants should be used only on instruments that are impossible to sterilize or disinfect with heat.

C.2.2 Sterilization should be used for instruments or devices, such as scalpels and needles, that penetrate skin or contact normally sterile areas of the body. The use of disposable invasive equipment eliminates the need to sterilize such items. Where indicated, however, arrangements should be made with a health care facility for sterilization of reusable invasive instruments.

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C.3 High-Level Disinfection. This method destroys all forms of microbial life, except high numbers of bacterial spores.

C.3.1 High-level disinfection can be achieved by hot water pasteurization [80°C to 100°C (176°F to 212°F) for 30 minutes], exposure to an EPA-regulated sterilant, as specified in C.2 , except that a short exposure time (e.g., 10 to 45 minutes) should be used, or adherence to manufacturer's instructions.

C.3.2 High-level disinfection should be used for reusable instruments or devices, such as laryngoscope blades and endotracheal tubes, that come into contact with mucous membranes.

C.4 Intermediate-Level Disinfection. Intermediate-level disinfection destroys *Mycobacterium tuberculosis*, vegetative bacteria, most viruses, and most fungi but does not kill bacterial spores, such as *B. anthracis* (anthrax) spores.

C.4.1 Intermediate-level disinfection can be achieved by EPA-registered hospital-disinfectant, chemical germicides that have a label claim for tuberculocidal activity; commercially available hard-surface germicides; or solutions containing at least 500 ppm free available chlorine [a 1:100 dilution of common household chlorine bleach — approximately 30 mL of chlorine bleach per liter of tap water (one half cup of chlorine bleach per gallon of tap water)].

C.4.2 Intermediate-level disinfection can be used for surfaces (such as those of stethoscopes, blood pressure cuffs, and splints) that come into contact only with intact skin and have been visibly contaminated with body fluids. Surfaces should be precleaned of visible material before the germicidal chemical is applied for disinfection.

C.5 Low-Level Disinfection. This method destroys most bacteria, some viruses, and some fungi, but not *Mycobacterium tuberculosis* or bacterial spores.

C.5.1 Low-level disinfection can be achieved by EPA-registered hospital disinfectants (no label claim for tuberculocidal activity).

C.5.2 Low-level disinfection should be used for routine housekeeping or removal of soiling in the absence of visible body fluid contaminants. These agents are excellent cleaners.

C.6 Environmental Disinfection. Environmental surfaces that have become soiled should be cleaned and disinfected.

C.7 Housekeeping. Employers should ensure that the worksite is maintained in a neat condition, free of any contamination. The employer should determine and implement an appropriate written schedule for cleaning and decontamination. The method of decontamination should be based on location within the facility, type of surface to be cleaned, type of contamination, and tasks or procedures to be performed, such as the following:

(1) PPE and other clothing should be cleaned or laundered, or both.
(2) Emergency medical equipment should be cleaned and disinfected.
(3) Invasive medical instruments should be cleaned and sterilized.
(4) Contaminated surfaces should be cleaned and disinfected with a disinfectant appropriate for the surface.
(5) Contaminated work surfaces should be decontaminated immediately or as soon as feasible after completion of the emergency medical operation. They should also be decontaminated at the end of the workshift if it is possible that the surface has been contaminated since the last decontamination was performed.

CAUTION: To ensure the effectiveness of any sterilization or disinfection process, equipment and instruments first should be thoroughly cleaned of all visible soilage.

Annex D Informational References

D.1 Referenced Publications. The following documents or portions thereof are referenced within this standard for informational purposes only and are thus not part of the requirements of this document unless also listed in Chapter 2.

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

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2002 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.

D.1.2 Other Publications.

D.1.2.1 CDC Publications. Centers for Disease Control and Prevention, 1600 Clifton Rd., Atlanta, GA 30333.

A Curriculum Guide for Public Safety and Emergency Response Workers, Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus, February 1989.

Bolyard, Elizabeth A., et al, *Guideline for infection control in health care personnel*, July 1983.

Guideline for Hand Hygiene in Health-Care Settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force, 2002.

Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health Care and Public Safety Workers, February 1989.

"Public Health Service Guidelines for Counseling and Antibody Testing to Prevent HIV Infection and AIDS," *Morbidity and Mortality Weekly Review*, Vol. 36, No. 31, 1987, pp. 509–515.

"Recommendations for Prevention of HIV Transmission in Health-Care Settings," *Morbidity and Mortality Weekly Review*, 36 (SU02), 1987.

Schulster, L. M., et al, *Guidelines for Environmental Infection Control in Health-Care Facilities:* Recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC), 2004.

D.1.2.2 IAFF Publication. International Association of Fire Fighters, 1750 New York Avenue, NW, Washington, DC.

Training for Hazardous Material Response: Infectious Diseases.

D.1.2.3 USFA Publications. U.S. Fire Administration, Publications Office, 16825 S. Seton Ave., Emmitsburg, MD 21727.

Infection Control for Emergency Response Personnel: The Supervisor's Role (Student Manual), February 1992.

Publication FA-112, *Guide to Developing an Emergency Service Infection Control Program*, March 1992.

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Publication FA-112, *Guide to Managing an Emergency Service Infection Control Program*, January 2002.

D.1.2.4 U.S. Government Publications. U.S. Government Printing Office, Washington, DC 20402.

EPA Guide for Infectious Waste Management, 1986.

Public Law 101-381, *The Ryan White Comprehensive AIDS Resources Emergency* (CARE) Act of 1990, Final Rule.

Title 29, Code of Federal Regulations, Part 1910.134, "Respiratory Protection."

Title 29, Code of Federal Regulations, Part 1910.1030, "Bloodborne Pathogens."

U.S. General Services Administration, Federal Specification KKK-A-1822E, *Star-of-Life Ambulance*, June 1, 2002.

D.1.2.5 Other Publications. *Merriam-Webster's Collegiate Dictionary*, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

D.2 Informational References. (Reserved)

D.3 References for Extracts. The following documents are listed here to provide reference information, including title and edition, for extracts given throughout the nonmandatory sections of this standard as indicated by a reference in brackets [ ] following a section or paragraph. These documents are not a part of the requirements of this document unless also listed in Chapter 2 for other reasons.

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

NFPA 1451, *Standard for a Fire Service Vehicle Operations Training Program*, 2002 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2002 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 1999, *Standard on Protective Clothing for Emergency Medical Operations*, 2003 edition.

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Index

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-A-

Airborne pathogens ..... *see* Pathogens
Ambulance ambient air filtration 6.2.5, A.6.2.5
Ambulance ventilation 6.2.4, A.6.2.4
Application of standard 1.3
Approved (definition) 3.2.1
Authority having jurisdiction (definition) 3.2.2

-B-

Bathrooms 5.4, A.5.4.1
Blood 7.2.6.1, 8.4.2, 8.7.4, 8.8.1
Definition 3.3.1
Bloodborne pathogens ..... *see* Pathogens
Body fluids 7.1.2, 7.2.12, 8.3.3, 8.4.4, A.7.1.2
Definition 3.3.2
Potentially infectious materials (definition) 3.3.45

-C-

Centers for Disease Control and Prevention 1.4.1
Chlorine bleach 8.4.6.2
Cleaning and disinfection ..... 4.1.3, Chap. 8, A.4.1.3(6)
Of clothing ..... *see* Clothing
Definition 3.3.3
Disinfectants for ..... *see* Disinfectants
Of emergency medical equipment ..... *see* Emergency medical equipment
Of environmental surfaces ..... *see* Environmental surfaces
Exposed area 4.6.1, 4.6.2
Facilities for 5.5, 5.7, 5.8, A.5.5.1, A.5.8.1
Of personal protective equipment ..... *see* Personal protective equipment (PPE)
Protective clothes/gloves used for ..... 7.2.11 to 7.2.14, 8.3.3
Skin washing ..... *see* Skin washing
Training for 4.3.2
Of worksite 8.7, C.7
Cleaning areas 5.7
Cleaning gloves ..... 7.2.11 to 7.2.14, 8.2.2.2
Definition 3.3.4
Clothing
Cleaning and disinfecting 4.1.3, 5.5, 8.4, A.5.5.1, A.8.4.1.1.A.8.4.6.1
Cleaning area for 5.7
Disposal 4.1.3
Communicable diseases/infections ..... 4.3.3, 4.6.8, A.4.3.3; *see also* Immunizations
Screening 4.5.1
Containers
Cleaning 8.7.4
Labeling 8.6.3, 8.6.6, 8.8
Laundry ..... 8.6.2 to 8.6.4, 8.6.6
Sharps ..... *see* Sharps containers
Waste 8.5.6.1, 8.7.4, 8.8
Contaminated (definition) 3.3.5
Contaminated sharps ..... 8.5.2 to 8.5.4
Definition 3.3.6

-D-

Decontamination ..... *see also* Cleaning and disinfection
Definition 3.3.7
Training for 4.3.2
Worksite 8.7
Definitions ..... Chap. 3
Disinfectants ..... 8.2, 8.3.5 to 8.3.7, 8.3.9, A.8.3.9
Disinfecting facilities 5.8, A.5.8.1
Disinfection
Cleaning and ..... *see* Cleaning and disinfection
Definition 3.3.8, A.3.3.8
Disposal areas 5.9
Disposal of materials ..... 4.1.3, 5.9, 8.4.8, 8.5, A.4.1.3(6), A.8.5
Gloves 7.2.2
Training for 4.3.2

-E-

Education programs 4.3, A.4.3.1, A.4.3.3
Emergency medical care (definition) 3.3.9
Emergency medical equipment
Cleaning and disinfecting ..... 4.1.3(5), 5.8, 8.3, A.5.8.1, A.8.3.9, C.1 to C.6
Contaminated 5.6.5, 8.5.5
Disposal of ..... 4.1.3, 8.5.5, 8.5.6, A.4.1.3(6)
Personal protective equipment ..... 7.2.1 to 7.2.6, A.7.2.6.2
Reusable 8.3.8
Storage ..... 5.6.1 to 5.6.3, 5.6.5, 8.3.4, A.5.6.1
Emergency medical operations 4.2.2
Definition 3.3.10
Protection ..... Chap. 7
Engineering controls (definition) 3.3.11, A.3.3.11
Environmental surfaces
Cleaning and disinfecting 8.3.9, 8.7.2, 8.7.3, A.8.3.9
Definition 3.3.12
Equipment storage areas ..... *see* Storage areas
Equivalency to standard 1.4, A.1.4.1
Exposure incidents 4.6, A.4.6.4, A.4.6.5
Definition 3.3.13
Notification of ..... *see* Notification, of exposure incident
Reports and records ..... *see* Reports and records, incident
Eyewear ..... *see* Splash-resistant eyewear

-F-

Face protection devices 8.2.2.2
Definition 3.3.15, A.3.3.15
Facilities, fire department ..... *see* Fire departments
Fire apparatus ..... Chap. 6
Ambulance ambient air filtration 6.2.5, A.6.2.5
Ambulance interior surfaces 6.2.6, A.6.2.6
Ambulance ventilation 6.2.4, A.6.2.4
Definition 3.3.16
Vehicles used to transport patients ..... 6.2, A.6.2.4 to A.6.2.6
Fire departments
Definition 3.3.17
Facilities ..... 4.2.2, Chap. 5
Definition 3.3.18, A.3.3.18
Industrial (definition) 3.3.32, A.3.3.32
Members (definition) 3.3.39
Programs ..... Chap. 4
Fluid-resistant clothing 7.2.5, 7.2.6.1, 7.2.13
Definition 3.3.20
Fluids, body ..... *see* Body fluids
Foodborne pathogens (definition) 3.3.47.3, A.3.3.47.3

-G-

Garments (definition) ..... 3.3.21; *see also* Clothing; Personal protective equipment (PPE)

--`,,```-`-`,,`,,`,`,,`---

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Gloves ..... 7.1.4; *see also* Cleaning gloves; Medical gloves; Structural fire-fighting gloves
Disposal of 7.2.2
Government regulations ..... 5.9.6; *see also* Regulated waste

-H-

Hand washing 7.1.4, 7.2.3
Handwashing facility (definition) 3.3.22
HBV (Hepatitis B virus) .....*see* Hepatitis
HCV (Hepatitis C virus) .....*see* Hepatitis
Health and safety officer (definition) 3.3.27, A.3.3.27
Health data base
Confidential 4.5.3, 4.5.4, 4.6.5.2
Definition 3.3.28
Departmental 4.6.7
Health maintenance 4.5
Hepatitis
HAV, Hepatitis A Virus ..... 4.5.1.1(7)
HBV, Hepatitis B Virus ..... 4.5.1.1(3)
Definition 3.3.29.1
HCV, Hepatitis C Virus ..... 4.5.1.1(2)
Definition 3.3.29.2
HIV (Human Immunodeficiency Virus) ..... 4.5.1.1.2, 4.5.1.1(10), 4.5.1.1(11), A.1.4.1
Definition 3.3.30
Housekeeping 8.7, C.7

-I-

Immunizations
Definition 3.3.31
Programs 4.5.1
Industrial fire department (definition) 3.3.32, A.3.3.2
Infection (definition) 3.3.33
Infection control officer 4.4, 4.6.3, 4.6.8, A.4.4.3
Definition 3.3.34
Infection control program (definition) 3.3.35, A.3.3.35
Influenza 4.5.1

-K-

Kitchens 5.2, A.5.2.4
Definition 3.3.36, A.3.3.36

-L-

Labeling, of containers 8.6.3, 8.6.6, 8.8
Laundry, contaminated 8.6
Laundry areas 5.5, A.5.5.1
Leakproof bags 8.4.4, 8.5.5, 8.5.7, 8.6.4
Definition 3.3.37
Linens, contaminated 8.6

-M-

Masks 7.2.5, 7.2.6.1
Definition 3.3.38
Pocket 7.2.7.1
Definition 3.3.50
Measles ..... 4.5.1.1(5)
Medical evaluation and treatment, post-exposure 4.5.2, 4.6.4, A.4.6.4
Medical gloves ..... 7.2.1 to 7.2.3, 7.2.5, 7.2.10, A.7.2.10
Definition 3.3.39, A.3.3.39
Medical waste .....*see also* Regulated waste
Contaminated 8.5.5
Definition 3.3.40
Disposal of .....*see* Disposal of materials
Labeling of 8.8
Receptacles 8.5.6, 8.7.4, 8.8
Member, fire department (definition) 3.3.41, A.3.3.41
Mucous membrane 4.6.1, 7.1.2, A.7.1.2
Definition 3.3.42
Mumps ..... 4.5.1.1(5)

-N-

Needles ..... 7.3; *see also* Contaminated sharps
Definitions 3.3.43
Notification, of exposure incident 4.4.4, 4.6.3, 4.6.8

-O-

Occupational exposure (definition) ..... 3.3.44; *see also* Exposure incidents
Occupational Safety and Health Administration 1.4.1

-P-

Parenteral (definition) 3.3.46
Pathogens
Airborne 7.2.6.2, A.7.2.6.2
Definition 3.3.47.1, A.3.3.47.1
Bloodborne 4.5.1.2, A.1.4.1, A.4.6.5
Definition 3.3.47.2, A.3.3.47.2
Definition 3.3.47
Foodborne (definition) 3.3.47.3, A.3.3.47.3
Patients
Definition 3.3.48
Vehicles used to transport ..... 6.2, A.6.2.4 to A.6.2.6
Personal protective equipment (PPE) 7.2, A.7.2.6.2
Cleaning and disinfection of ..... 4.1.3(4), 4.2.2, 8.4, A.8.4.1.1, A.8.4.6.1
Cleaning area for 5.7
Contaminated 5.6.4, 8.5.5
Definition 3.3.49, A.3.3.49
Disposal of ..... 4.1.3, 8.5.5, 8.5.6, A.4.1.3(6)
Storage of 5.6.4, 8.4.8
Training in use of 4.3.2
Used for cleaning ..... 7.2.11 to 7.2.14, 8.3.3
Used for emergency medical care ..... 7.2.1 to 7.2.6, A.7.2.6.2
Pocket masks 7.2.7.1
Definition 3.3.50
Policy ..... 4.1, A.4.1.3(6)
Sample policy statements ..... Annex B
Post-exposure prophylaxis (definition) 3.3.51
Potentially infectious materials (definition) 3.3.45
Program components ..... Chap. 4
Purpose of standard 1.2

-R-

References ..... Chap. 2, Annex D
Regulated waste 5.9, 8.8
Definition 3.3.52
Reports and records, incident ..... 4.4.4, 4.6.3, 4.6.5 to 4.6.7, A.4.6.5
Reproductive health risks 4.3.4
Respiratory protection 7.2.6.2, A.7.2.6.2
Resuscitation equipment 7.2.7
Definition 3.3.53
Risk (definition) 3.3.54
Risk management 4.2, A.4.2
Rubella ..... 4.5.1.1(5)
Runoff, contaminated 8.3.6

-S-

Scalpels 7.3.1, 7.3.2
Scope of standard 1.1
Self-contained breathing apparatus (SCBA) 8.4.9
Shall (definition) 3.2.3
Sharp objects, handling of ..... 7.3; *see also* Contaminated sharps
Sharps containers ..... 7.3.4, 7.3.5, 8.5.1 to 8.5.4, 8.8.1
Definition 3.3.55

--`,,```-`-`,,`,,`,`,,`---
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Should (definition) 3.2.4
Skin lesions or diseases 7.1.1
Skin washing ..... 7.1.2 to 7.1.4, 7.2.3, 8.1, A.7.1.2
Sleeping areas 5.3
Source individual (definition) 3.3.56
Splash-resistant eyewear 7.2.5, 7.2.6.1, 7.2.13
Definition 3.3.57
Standard (definition) 3.2.5
Sterilization ..... Annex C
Definition 3.3.58, A.3.3.58
Storage areas 5.6, 8.3.4, 8.4.8, A.5.6.1
Structural fire-fighting gloves ..... 7.2.8 to 7.2.10, 8.4.6, A.7.2.10, A.8.4.6.1
Definition 3.3.59
Structural fire-fighting protective clothing
Cleaning and disinfection of ..... 4.1.3(2), 8.4.5, 8.4.6, A.8.4.6.1
Disposal of ..... 4.1.3, A.4.1.3(6)

-T-

Tetanus ..... 4.5.1.1(4)
Training programs 4.3, A.4.3.1, A.4.3.3
Tuberculosis ..... 4.5.1.1(1)

-U-

Universal precautions (definition) 3.3.61, A.3.3.61
U.S. Environmental Protection Agency 8.2.1

-W-

Waste .....*see* Medical waste; Regulated waste
Worksite, cleaning of 8.7, C.7

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Sequence of Events Leading to Publication of an NFPA Committee Document

Call goes out for proposals to amend existing document or for recommendations on new document.

▼

Committee meets to act on proposals, to develop its own proposals, and to prepare its report.

▼

Committee votes on proposals by letter ballot. If two-thirds approve, report goes forward. Lacking two-thirds approval, report returns to committee.

▼

Report — *Report on Proposals* (ROP) — is published for public review and comment.

▼

Committee meets to act on each public comment received.

▼

Committee votes on comments by letter ballot. If two-thirds approve, supplementary report goes forward. Lacking two-thirds approval, supplementary report returns to committee.

▼

Supplementary report — *Report on Comments* (ROC) — is published for public review.

▼

NFPA membership meets (Annual or Fall Meeting) and acts on committee report (ROP or ROC).

▼

Committee votes on any amendments to report approved at NFPA Annual or Fall Meeting.

▼

Appeals to Standards Council on Association action must be filed within 20 days of the NFPA Annual or Fall Meeting.

▼

Standards Council decides, based on all evidence, whether or not to issue standard or to take other action, including upholding any appeals.

Committee Membership Classifications

The following classifications apply to Technical Committee members and represent their principal interest in the activity of the committee.

M *Manufacturer:* A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.

U *User:* A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.

I/M *Installer/Maintainer:* A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.

L *Labor:* A labor representative or employee concerned with safety in the workplace.

R/T *Applied Research/Testing Laboratory:* A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.

E *Enforcing Authority:* A representative of an agency or an organization that promulgates and/or enforces standards.

I *Insurance:* A representative of an insurance company, broker, agent, bureau, or inspection agency.

C *Consumer:* A person who is, or represents, the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in the *User* classification.

SE *Special Expert:* A person not representing any of the previous classifications, but who has a special expertise in the scope of the standard or portion thereof.

NOTES:

1. "Standard" connotes code, standard, recommended practice, or guide.
2. A representative includes an employee.
3. While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of members or unique interests need representation in order to foster the best possible committee deliberations on any project. In this connection, the Standards Council may make such appointments as it seems appropriate in the public interest, such as the classification of "Utilities" in the National Electrical Code Committee.
4. Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.

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Date 12/18/02 **Name** John B. Smith **Telephone** 617-555-1212
Company _____
Address 9 Seattle St. **City** Seattle **State** WA **Zip** 02255
Please indicate organization represented (if any) Fire Marshals Assn. of North America

1. **a) NFPA Document Title** National Fire Alarm Code
   b) NFPA No. & Edition NFPA 72, 2002 ed. **c) Section/Paragraph** 4.4.7.1.1

2. **Proposal Recommends:** *(check one)* ☐ **new text** ☐ **revised text** ☒ **deleted text**

3. **Proposal.** *(Include proposed new or revised wording, or identification of wording to be deleted.)* Note: Proposed text should be in legislative format, that is, use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~). Delete exception.

4. **Statement of Problem and Substantiation for Proposal.** Note: State the problem that will be resolved by your recommendation. Give the specific reason for your proposal including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication. A properly installed and maintained system should be free of ground faults. The occurrence of one or more ground faults should be required to cause a "trouble" signal because it indicates a condition that could contribute to future malfunction of the system. Ground fault protection has been widely available on these systems for years and its cost is negligible. Requiring it on all systems will promote better installations, maintenance and reliability.

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