NFPA® 473

Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents

2008 Edition

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NFPA® 473

Standard for

Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents

2008 Edition

This edition of NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents*, was prepared by the Technical Committee on Hazardous Materials Response Personnel. It was issued by the Standards Council on June 4, 2007, with an effective date of June 24, 2007, and supersedes all previous editions.

This edition of NFPA 473 was approved as an American National Standard on June 24, 2007.

Origin and Development of NFPA 473

Following the development of NFPA 471, *Recommended Practice for Responding to Hazardous Materials Incidents* (which has been incorporated into NFPA 472 and NFPA 473 for the 2008 editions), and NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents* (which has been retitled *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents* for the 2008 edition), the Technical Committee on Hazardous Materials Response Personnel undertook the development of a standard relating to the professional competencies of emergency medical personnel who could be required to respond to hazardous materials incidents. The roles and responsibilities of EMS personnel at hazardous materials incidents had not been identified in the majority of emergency response systems.

The first edition of NFPA 473 was released in 1992. In the 1997 edition, the committee reviewed the first edition and updated it for consistency with the related NFPA 471 and NFPA 472 and for clarity of the competencies.

In 1998 the committee processed a Tentative Interim Amendment (TIA) to address concerns related to the unique challenges of responding to hazardous materials incidents that could be caused by criminal or terrorist activity. Those concerns were motivated by the 1995 bombing of the Alfred P. Murrah Federal Building in Oklahoma City and other national and international incidents.

The TIA added paragraphs on recognizing criminal and terrorist activities, differentiating between chemical and biological agents, actions to take when criminal or terrorist activity is suspected, providing patient care at incidents resulting from chemical and biological agents, and other similar competencies.

In the 2002 edition, the TIA material was updated and moved into the body of the text, along with other updates to coordinate with a similar TIA and other new material in NFPA 472 related to weapons of mass destruction and incidents involving radioactive materials. Additional changes in wording and format were made in accordance with the 2000 edition of the *Manual of Style for NFPA Technical Committee Documents*.

The 2008 edition of NFPA 473 has been completely rewritten to address the hazards that emergency medical services (EMS) personnel encounter from hazardous materials/weapons of mass destruction. New definitions and technical information have been added. The requirements in the 2008 edition will enhance the safety and protection of response personnel and all components of the EMS system.

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

Committee Scope: This Committee shall have primary responsibility for documents on the requirements for the professional competence, training, procedures, and equipment for emergency responders to hazardous materials incidents.

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2008 Edition

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

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

Chapter 1 Administration

1.1 Scope. This standard identifies the levels of competence required of emergency medical services (EMS) personnel who respond to incidents involving hazardous materials or weapons of mass destruction (WMD). It specifically covers the requirements for basic life support and advanced life support personnel in the pre-hospital setting.

1.1.1 This standard is based on the premise that all EMS responders are trained to meet at least the core competencies of the operations level responders as defined in Chapter 5 of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.*

1.2 Purpose. The purpose of this standard is to specify minimum requirements of competence and to enhance the safety and protection of response personnel and all components of the emergency medical services system. It is not the intent of this standard to restrict any jurisdiction from exceeding these minimum requirements.

1.3* CDC Categories A, B, and C. This standard uses the U.S. Centers for Disease Control and Prevention (CDC) categories of diseases and agents.

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 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents,* 2008 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response,* 2007 edition.

2.3 Other Publications.

Emergency Response Guidebook, Washington, D.C.: U.S. Department of Transportation, 2004.

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

Title 18 U.S. Code Section 2332a, "Use of weapons of mass destruction," Washington, D.C.: Government Printing Office.

2.4 References for Extracts in Mandatory Sections. (Reserved)

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.

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* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.4 Shall. Indicates a mandatory requirement.

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

3.2.6 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 Advanced Life Support (ALS). Emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction in conjunction with the American Heart Association guidelines.

3.3.1.1 ***Emergency Medical Technician — Intermediate (EMT-I).*** An individual who has completed a course of instruction that includes selected modules of the U.S. Department of Transportation National Standard EMT — Paramedic curriculum and who holds an intermediate level EMT-I or EMT-C certification from the authority having jurisdiction.

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3.3.1.2 ***Emergency Medical Technician — Paramedic (EMT-P).*** An individual who has successfully completed a course of instruction that meets or exceeds the requirements of the U.S. Department of Transportation National Standard EMT — Paramedic curriculum and who holds an EMT-P certification from the authority having jurisdiction.

3.3.1.3 ***Medical Director.*** Plans and directs all aspects of an organization's or system's medical policies and programs, including operations and offline (protocol) and online medical direction (direct communication consultation); is responsible for strategic clinical relationships with other physicians; oversees the development of the clinical content in materials; ensures all clinical programs are in compliance; writes and reviews research publications appropriate to support clinical service offerings; requires an active degree in medicine with specialty experience or training in emergency mitigation, administration, and management; relies on experience and judgment to plan and accomplish goals; and typically coordinates with the incident command.

3.3.1.4 ***Medical Team Specialist.*** Any healthcare provider or medically trained specialist acting under the authority of the medical director and within the context of the National Incident Management System authorized to act as the medical point of contact for an incident. This can include, but is not exclusive to, nurses, nurse practitioners, EMTs, ECAs, physician assistants, and in some cases a health and safety officer.

3.3.2 Basic Life Support (BLS). Emergency medical treatment at a level as defined by the medical authority having jurisdiction in conjunction with American Heart Association guidelines.

3.3.2.1* ***Emergency Care First Responder (ECFR).*** An individual who has successfully completed the specified emergency care first responder course developed by the U.S. Department of Transportation and who holds an ECFR certification from the authority having jurisdiction.

3.3.2.2 ***Emergency Medical Technician — Ambulance/Basic (EMT- A/B).*** An individual who has successfully completed an EMT-A or EMT-B curriculum developed by the U.S. Department of Transportation or equivalent, who holds an EMT-A/B certification from the authority having jurisdiction.

3.3.3 Competence. The possession of knowledge, skills, and judgment needed to perform indicated objectives satisfactorily.

3.3.4* Components of Emergency Medical Service (EMS) System. The parts of a comprehensive plan to treat an individual in need of emergency medical care following an illness or injury.

3.3.5 Contaminant. A hazardous material, or the hazardous component of a weapon of mass destruction (WMD), that physically remains on or in people, animals, the environment, or equipment, thereby creating a continuing risk of direct injury or a risk of exposure.

3.3.6 Core Competencies. The knowledge, skills, and judgment needed by operations level responders who can respond to releases or potential releases of hazardous materials/WMD.

3.3.7* Demonstrate. To show by actual performance.

3.3.8 Describe. To explain verbally or in writing using standard terms recognized in the hazardous materials response community.

3.3.9 Emergency Medical Services (EMS). The provision of treatment, such as first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other prehospital procedures, including ambulance transportation, to patients.

3.3.10 EMS Hazardous Materials (EMS/Hazardous Materials/WMD) Responder.

3.3.10.1 ***Emergency Medical Services Responders to Hazardous Materials/Weapon of Mass Destruction at the BLS Level (BLS Level Responder).*** In addition to their BLS certification, shall be trained to meet at least the core competencies of the operations level responders as defined in NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, and all competencies of Chapter 4 of this standard.

3.3.10.2 ***Emergency Medical Services Responders to Hazardous Materials/Weapon of Mass Destruction at the ALS Level (ALS Level Responder).*** In addition to their ALS certification, shall be trained to meet at least the core competencies of the operations level responders as defined in NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, and all competencies of Chapter 5 of this standard.

3.3.11 Exposure. The act or condition whereby responders or civilians come into contact with hazardous materials/WMD that results in any level of physical injury or acute/delayed health effect.

3.3.12* Hazardous Material. A substance (matter — solid, liquid, or gas — or energy) that when released is capable of creating harm to people, the environment, and property, including weapons of mass destruction (WMD) as defined in 18 U.S. Code, Section 2332a, as well as any other criminal use of hazardous materials, such as illicit laboratories, environmental crimes, or industrial sabotage. Hazardous materials/WMD shall be used throughout this document to represent hazardous materials/weapons of mass destruction.

3.3.13 Identify. To select or indicate verbally or in writing using standard terms to establish the identity of; the fact of being the same as the one described.

3.3.14 Incident. An emergency involving the release or potential release of hazardous materials/WMD.

3.3.15* Incident Commander (IC). The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources.

3.3.16 Incident Command System (ICS). A management system designed to enable effective and efficient on-scene incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

3.3.17* Incident Management System (IMS). A plan that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations to include the incident command system, multiagency coordination system, training, and management of resources.

3.3.18 Medical Control. The physician providing direction for patient care activities in the prehospital setting.

3.3.19 Medical Surveillance. The ongoing process of medical evaluation of hazardous materials response team members and public safety personnel who respond to a hazardous materials incident.

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3.3.20 Mission-Specific Competencies. The knowledge, skills, and judgment needed by operations level responders who have completed the requisite core competencies and who are designated by the authority having jurisdiction to perform mission-specific tasks, such as decontamination, victim/hostage rescue and recovery, evidence preservation and sampling, etc.

3.3.21 Patient. Any person or persons requiring or requesting a BLS/ALS evaluation or intervention at the scene of a hazardous materials/WMD incident.

3.3.22 Protocol. A guideline for a series of sequential steps describing the precise patient treatment.

3.3.23 Region. A geographic area that includes the local and neighboring jurisdiction for an EMS agency.

Chapter 4 Competencies for Hazardous Materials/ WMD Basic Life Support (BLS) Responder

4.1 General.

4.1.1 Introduction. All EMS personnel at the hazardous materials/WMD BLS responder level, in addition to their BLS certification, shall be trained to meet at least the core competencies of the operations level responders as defined in NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, and all competencies of this chapter.

4.1.2 Goal. The goal of the competencies at the BLS responder level shall be to provide the individual with the knowledge and skills necessary to safely deliver BLS at hazardous materials/WMD incidents, function within the established incident management system, and perform the following duties:

(1) Analyze a hazardous materials/WMD incident to determine the potential health hazards encountered by the BLS level responder, other responders, and anticipated and actual patients by completing the following tasks:
   (a) Survey an incident where hazardous materials/WMD have been released and evaluate suspected and identified patients for signs and symptoms of exposure.
   (b) Collect hazard and response information from available technical resources to determine the nature of the problem and potential health effects of the substances involved.

(2) Plan to deliver BLS to any exposed patient within the scope of practice by completing the following tasks:
   (a) Identify preplans of high-risk areas and occupancies to identify potential locations where significant human exposures can occur.
   (b) Identify the capabilities of the hospital network to accept exposed patients and perform emergency decontamination if required.
   (c) Identify the medical components of the communication plan.
   (d) Describe the role of the BLS level responder as it relates to the local emergency response plan and established incident management system.

(3) Implement a prehospital treatment plan within the scope of practice by completing the following tasks:
   (a) Determine the nature of the hazardous materials/ WMD incident as it relates to anticipated or actual patient exposures and subsequent medical treatment.
   (b) Identify the need for and the effectiveness of decontamination efforts.
   (c) Determine if the available medical resources will meet or exceed patient care needs.
   (d) Describe evidence preservation issues associated with patient care.
   (e) Develop and implement a medical monitoring plan for responders.
   (f) Report and document the actions taken by the BLS level responder at the incident scene.

4.2 Competencies — Analyzing the Incident.

4.2.1 Surveying Hazardous Materials/WMD Incidents. Given scenarios of hazardous materials/WMD incidents, the BLS level responder shall assess the nature and severity of the incident as it relates to anticipated or actual EMS responsibilities at the scene.

4.2.1.1 Given examples of the following types of containers, the BLS level responder shall identify the potential mechanisms of injury/harm and possible treatment modalities:

(1) Pressure
(2) Nonpressure
(3) Cryogenic
(4) Radioactive

4.2.1.2 Given examples of the nine U.S. Department of Transportation (DOT) hazard classes, the BLS level responder shall identify possible treatment modalities associated with each hazard class.

4.2.1.3 Given examples of various hazardous materials/WMD incidents at fixed facilities, the BLS level responder shall identify the following available health-related resource personnel:

(1) Environmental heath and safety representatives
(2) Radiation safety officers
(3) Occupational physicians and nurses
(4) Site emergency response teams
(5) Product or container specialists

4.2.1.4 Given various scenarios of hazardous materials/WMD incidents, the BLS level responder, working within an incident command system, shall evaluate the off-site consequences of the release based on the physical and chemical nature of the released substance and the prevailing environmental factors, to determine the need to evacuate or to shelter in place affected persons.

4.2.1.5 Given the following biological agents, the BLS level responder shall define the signs and symptoms of exposure and the likely means of dissemination:

(1) Variola virus (smallpox)
(2) *Botulinum* toxin
(3) *E. coli* O157:H7
(4) Ricin toxin
(5) *B. anthracis* (anthrax)
(6) Venezuelan equine encephalitis virus
(7) *Rickettsia*
(8) *Yersinia pestis* (plague)
(9) Tularemia
(10) Viral hemorrhagic fever
(11) Other CDC Category A, B, or C–listed organism

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4.2.1.6 Given examples of various types of hazardous materials/WMD incidents involving toxic industrial chemicals (TICs) and toxic industrial materials (TIMs) (e.g., corrosives, reproductive hazards, carcinogens, nerve agents, flammable and/or explosive hazards, blister agents, blood agents, choking agents, and irritants), the BLS level responder shall determine the general health risks to patients exposed to those substances in the case of any release with the following:

(1) A visible cloud
(2) Liquid pooling
(3) Solid dispersion

4.2.1.7 Determining If a Hazardous Materials/WMD Incident Is an Illicit Laboratory Operation. Given examples of hazardous materials/WMD incidents involving illicit laboratory operations, BLS level responders assigned to respond to illicit laboratory incidents shall identify the potential drugs/WMD being manufactured and shall meet the following related requirements:

(1)*Given examples of illicit drug manufacturing methods, describe the operational considerations, hazards, and products involved in the illicit process.
(2) Given examples of illicit chemical WMD methods, describe the operational considerations, hazards, and products involved in the illicit process.
(3) Given examples of illicit biological WMD methods, describe the operational considerations, hazards, and products involved in the illicit process.
(4) Given examples of illicit laboratory operations, describe the potential booby traps that have been encountered by response personnel.
(5) Given examples of illicit laboratory operations, describe the agencies that have investigative authority and operational responsibility to support the response.

4.2.1.8 Given examples of a hazardous materials/WMD incident involving radioactive materials, including radiological dispersion devices, the BLS level responder shall determine the probable health risks and potential patient outcomes by completing the following tasks:

(1) Determine the most likely exposure pathways for a given radiation exposure, including inhalation, ingestion, and direct skin exposure.
(2) Identify the difference between radiation exposure and radioactive contamination and the health concerns associated with each.

4.2.1.9 Given three examples of pesticide labels and labeling, the BLS level responder shall use the following information to determine the associated health risks:

(1) Hazard statement
(2) Precautionary statement
(3) Signal word
(4) Pesticide name

4.2.2 Collecting and Interpreting Hazard and Response Information. The BLS level responder shall obtain information from the following sources to determine the nature of the medical problem and potential health effects:

(1) Hazardous materials databases
(2) Clinical monitoring
(3) Reference materials
(4)*Technical information centers (e.g., CHEMTREC, CANUTEC, and SETIQ) and local state and federal authorities
(5) Technical information specialists
(6) Regional poison control centers

4.2.3 Establishing and Enforcing Scene Control Procedures. Given two scenarios involving hazardous materials/WMD incidents, the BLS level responder shall identify how to establish and enforce scene control, including control zones and emergency decontamination, and communications between responders and to the public and shall meet the following requirements:

(1) Identify the procedures for establishing scene control through control zones.
(2) Identify the criteria for determining the locations of the control zones at hazardous materials/WMD incidents.
(3) Identify the basic techniques for the following protective actions at hazardous materials/WMD incidents:
  (a) Evacuation
  (b) Sheltering-in-place protection
(4) Demonstrate the ability to perform emergency decontamination.
(5) Identify the items to be considered in a safety briefing prior to allowing personnel to work at the following:
  (a) Hazardous materials incidents
  (b) Hazardous materials/WMD incidents involving criminal activities
(6) Identify the procedures for ensuring coordinated communication between responders and to the public.

4.3 Competencies — Planning the Response.

4.3.1 Identifying High Risk Areas for Potential Exposures.

4.3.1.1 The BLS level responder, given an events calendar and pre-incident plans, which can include the local emergency planning committee plan, as well as the agency's emergency response plan and standard operating procedures (SOPs), shall identify the venues for mass gatherings, industrial facilities, potential targets for terrorism, and any other location where an accidental or intentional release of a harmful substance can pose an unreasonable health risk to any person in the local geographical area as determined by the AHJ and shall identify the following:

(1) Locations where hazardous materials/WMD are used, stored, or transported
(2) Areas and locations that present a potential for a high loss of life or rate of injury in the event of an accidental or intentional release of hazardous materials/WMD
(3)*External factors that may complicate a hazardous materials/WMD incident

4.3.2 Determining the Capabilities of the Local Hospital Network.

4.3.2.1 The BLS level responder shall identify the following methods and vehicles available to transport hazardous materials patients and shall determine the location and potential routes of travel to the medically appropriate local and regional hospitals, based on the patients' needs:

(1) Adult trauma centers
(2) Pediatric trauma centers
(3) Adult burn centers
(4) Pediatric burn centers
(5) Hyperbaric chambers
(6) Established field hospitals
(7) Dialysis centers

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(8) Supportive care facilities
(9) Forward deployable assets
(10) Other specialty hospitals or medical centers

4.3.2.2 Given a list of receiving hospitals in the region, the BLS level responder shall describe the location, availability, and capability of hospital-based decontamination facilities.

4.3.2.3 The BLS level responder shall describe the BLS protocols and SOPs at hazardous materials/WMD incidents as developed by the AHJ and the prescribed role of medical control and poison control centers, as follows:

(1) During mass casualty incidents
(2) Where exposures have occurred
(3) In the event of disrupted radio communications

4.3.2.4 The BLS level responder shall identify the formal and informal mutual aid resources (hospital- and nonhospital-based) for the field management of multicasualty incidents, as follows:

(1) Mass-casualty trailers with medical supplies
(2) Mass-decedent capabilities
(3) Regional decontamination units
(4) Replenishment of medical supplies during long-term incidents
(5) Rehabilitation units for the EMS responders
(6) Replacement transport units for vehicles lost to mechanical trouble, collision, theft, and contamination

4.3.2.5 The BLS level responder shall identify the special hazards associated with inbound and outbound air transportation of patients exposed to hazardous materials/WMD.

4.3.3 Identifying Incident Communications.

4.3.3.1 Given an incident communications plan, the BLS level responder shall identify the following:

(1) Medical components of the communications plan
(2) Ability to communicate with other responders, transport units, and receiving facilities

4.3.3.2 Given examples of various patient exposure scenarios, the BLS level responder shall describe the following information to be transmitted to the medical or poison control center or the receiving hospital prior to arrival:

(1) The name of the substance(s) involved
(2) Physical and chemical properties of the substance(s) involved
(3) Number of victims being transported
(4) Age and sex of transported patient
(5) Patient condition and chief complaint
(6) Medical history
(7) Circumstances and history of the exposure, such as duration of exposure and primary route of exposure
(8) Vital signs, initial and current
(9) Symptoms described by the patient, initial and current
(10) Presence of associated injuries, such as burns and trauma
(11) Decontamination status
(12) Treatment rendered or in progress
(13) Patient response to treatment(s)
(14) Estimated time of arrival

4.3.4 Identifying the Role of the BLS Level Responder.

4.3.4.1 Given scenarios involving hazardous materials/WMD, the BLS level responder shall identify his or her role during hazardous materials/WMD incidents as specified in the emergency response plan and SOPs developed by the AHJ, as follows:

(1) Describe the purpose, benefits, and elements of the incident command system as it relates to the BLS level responder.
(2) Describe the typical incident command structure, for the emergency medical component of a hazardous materials/WMD incident as specified in the emergency response plan and SOPs, as developed by the AHJ.
(3) Demonstrate the ability of the BLS level responder to function within the incident command system.
(4) Demonstrate the ability to implement an incident command system for a hazardous materials/WMD incident where an ICS does not currently exist.
(5) Identify the procedures for requesting additional resources at a hazardous materials/WMD incident.

4.3.4.2 The hazardous materials/WMD BLS responder shall describe his or her role within the hazardous materials response plan developed by the AHJ or identified in the local emergency response plan, as follows:

(1) Determine the toxic effect of hazardous materials/WMD.
(2) Estimate the number of patients.
(3) Recognize and assess the presence and severity of symptoms.
(4) Take and record vital signs.
(5) Determine resource maximization and assessment.
(6) Assess the impact on the health care system.
(7) Perform appropriate patient monitoring.
(8) Communicate pertinent information.

4.4 Competencies — Implementing the Planned Response.

4.4.1 Determining the Nature of the Incident/Providing Medical Care. The BLS level responder shall demonstrate the ability to identify the mechanisms of injury or harm and the clinical implications and provide emergency medical care to those patients exposed to hazardous materials/WMD agent by completing the following tasks:

(1) Determine the physical state of the released substance, in addition to the environmental influences surrounding the release, as follows:
   (a) Solid
   (b) Liquid
   (c) Gas
   (d) Vapor
   (e) Dust
   (f) Mist
   (g) Aerosol
(2) Identify potential routes of exposure and correlate those routes of exposure to the physical state of the released substance, to determine the origin of the illness or injury, as follows:
   (a) Inhalation
   (b) Absorption
   (c) Ingestion
   (d) Injection
(3)*Describe the potential routes of entry into the body, the common signs and symptoms of exposure, and the BLS treatment options approved by the AHJ for exposure(s) to the following classification of substances:
   (a) Corrosives
   (b) Pesticides

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(c) Chemical asphyxiants
(d) Simple asphyxiants
(e) Organic solvents
(f) Nerve agents
(g) Vesicants and blister agents
(h) Blood agents
(i) Choking agents
(j) Irritants
(k) Biological agents and toxins
(l) Incapacitating agents
(m) Radiological materials
(n) Nitrogen compounds
(o) Opiate compounds
(p) Fluorine compounds
(q) Phenolic compounds

(4) Describe the basic toxicological principles relative to assessment and treatment of persons exposed to hazardous materials, including the following:
(a) Acute and delayed effects
(b) Local and systemic effects
(c) Dose–response relationship

(5) Given examples of various hazardous materials/WMD, define the basic toxicological terms as applied to patient care:
(a) Threshold limit value — time-weighted average (TLV-TWA)
(b) Permissible exposure limit (PEL)
(c) Threshold limit value — short-term exposure limit (TLV-STEL)
(d) Immediately dangerous to life and health (IDLH)
(e) Threshold limit value — ceiling (TLV-C)
(f) Parts per million/parts per billion/parts per trillion (ppm/ppb/ppt)

(6) Given examples of hazardous materials/WMD incidents with exposed patients, evaluate the progress and effectiveness of the medical care provided at a hazardous materials/WMD incident to ensure that the overall incident response objectives, along with patient care goals, are being met by completing the following tasks:
(a) Locate and track all exposed patients at a hazardous materials/WMD incident, from triage and treatment to transport to a medically appropriate facility.
(b) Review the incident objectives at periodic intervals to ensure that patient care is being carried out within the overall incident action plan.
(c) Ensure that the required incident command system forms are completed, along with the patient care forms, during the course of the incident.
(d) Evaluate the need for trained and qualified EMS personnel, medical equipment, transport units, and other supplies based on the scope and duration of the incident.

4.4.2 Decontamination. Given the emergency response plan and SOPs developed by the AHJ, the BLS level responder shall do the following:

(1) Determine if patient decontamination activities were performed prior to accepting responsibility and transferring care of exposed patients.
(2) Determine the need and location for patient decontamination, including mass casualty decontamination, in the event none has been performed prior to arrival of EMS personnel and complete the following tasks:
(a) Given the emergency response plan and SOPs developed by the AHJ, identify sources of information for determining the appropriate decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident.
(b) Given the emergency response plan and SOPs developed by the AHJ, identify (within the plan) the supplies and equipment required to set up and implement the following:
i. Emergency decontamination operations for ambulatory and nonambulatory patients
ii. Mass decontamination operations for ambulatory and nonambulatory patients
(c) Identify procedures, equipment, and safety precautions for the treatment and handling of emergency service animals brought to the decontamination corridor at hazardous materials/WMD incidents.
(d) Identify procedures, equipment, and safety precautions for communicating with critical, urgent, and potentially exposed patients and identify population prioritization as it relates to decontamination purposes.
(e) Identify procedures, equipment, and safety precautions for preventing cross contamination.

4.4.3 Determining the Ongoing Need for Medical Supplies.

4.4.3.1 Given examples of single-patient and multicasualty hazardous materials/WMD incidents, the BLS level responder shall determine the following:

(1) If the available medical equipment will meet or exceed patient care needs throughout the duration of the incident
(2) If the available transport units will meet or exceed patient care needs throughout the duration of the incident

4.4.4 Preserving Evidence. Given examples of hazardous materials/WMD incidents where criminal acts are suspected, the BLS level responder shall make every attempt to preserve evidence during the course of delivering patient care by completing the following tasks:

(1) Determine if the incident is potentially criminal in nature and cooperate with the law enforcement agency having investigative jurisdiction.
(2) Identify the unique aspects of criminal hazardous materials/WMD incidents, including crime scene preservation and evidence preservation, to avoid the destruction of potential evidence on medical patients during the decontamination process.
(3) Identify within the emergency response plan and SOPs developed by the AHJ procedures, equipment, and safety precautions for securing evidence during decontamination operations at hazardous materials/WMD incidents.
(4) Ensure that any information regarding suspects, sequence of events during a potentially criminal act, and observations made based on patient presentation or during patient assessment are documented and communicated to the law enforcement agency having investigative jurisdiction.

4.4.5 Medical Support at Hazardous Materials/WMD Incidents. Given examples of hazardous materials/WMD incident, the BLS level responder shall describe the procedures of the AHJ for performing medical monitoring and support of hazardous materials incident response personnel and shall complete the following tasks:

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(1) Given examples of various hazardous materials/WMD incidents requiring the use chemical protective ensembles, the BLS level responder shall complete the following tasks:
   (a) Demonstrate the ability to set up and operate a medical monitoring station.
   (b) Demonstrate the ability to recognize the signs and symptoms of heat stress, cold stress, heat exhaustion, and heat stroke.
   (c) Determine the BLS needs for responders exhibiting the effects of heat stress, cold stress, and heat exhaustion.
   (d) Describe the medical significance of heat stroke and the importance of rapid transport to an appropriate medical receiving facility.
   (e) Given a simulated hazardous materials incident, demonstrate the appropriate documentation of medical monitoring activities.

(2) The BLS level responder responsible for pre-entry medical monitoring shall obtain hazard and toxicity information on the hazardous materials/WMD from the designated hazardous materials technical reference resource or other sources of information at the scene.

(3) The following information shall be conveyed to the entry team, incident safety officer, hazardous materials officer, other EMS personnel at the scene, and any other responders responsible for the health and well-being of those personnel operating at the scene:
   (a) Chemical name
   (b) Hazard class
   (c) Multiple hazards and toxicity information
   (d) Applicable decontamination methods and procedures
   (e) Potential for cross contamination
   (f) Procedure for transfer of patients from the constraints of the incident to the EMS
   (g) Prehospital management of medical emergencies and exposures

(4) The BLS level responder shall evaluate the pre-entry health status of responders to hazardous materials/WMD incidents prior to their donning personal protective equipment (PPE) by performing the following tasks (consideration shall be given to excluding responders if they do not meet criteria specified by the AHJ prior to working in chemical protective clothing):
   (a) A full set of vital signs
   (b) Body weight measurements to address hydration considerations
   (c) General health observations
   (d) Core body temperature: hypothermia/hyperthermia
   (e) Blood pressure: hypotension/hypertension
   (f) Pulse rate: bradycardia/tachycardia as defined
   (g) Respiratory rate: bradypnea/tachypnea

(5) The BLS level responder shall determine how the following factors influence heat stress on hazardous materials/WMD response personnel:
   (a) Baseline level of hydration
   (b) Underlying physical fitness
   (c) Environmental factors
   (d) Activity levels during the entry
   (e) Level of PPE worn
   (f) Duration of entry
   (g) Cold stress

(6) The BLS level responder shall medically evaluate all team members after decontamination and PPE removal, using the following criteria:
   (a) Pulse rate determined within the first minute
   (b) Pulse rate determined 3 minutes after initial evaluation
   (c) Temperature
   (d) Body weight
   (e) Blood pressure
   (f) Respiratory rate

(7) The BLS level responder shall recommend that any hazardous materials team member be prohibited from redonning chemical protective clothing if any of the following criteria is exhibited:
   (a) Signs or symptoms of heat stress or heat exhaustion
   (b) Pulse rate: tachycardia/bradycardia
   (c) Core body temperature: hyperthermia/hypothermia
   (d) Recovery heart rate with a trend toward normal rate and rhythm
   (e) Blood pressure: hypertension/hypotension
   (f) *Weight loss of >5 percent

(8) Any team member exhibiting the signs or symptoms of extreme heat exhaustion or heat stroke shall be transported to the medical facility.

(9) The BLS level responder responsible for medical monitoring and support shall immediately notify the persons designated by the incident action plan that a team member required significant medical treatment or transport. Transportation shall be arranged through the designee identified in the emergency response plan.

4.5 Reporting and Documenting the Incident. Given a scenario involving a hazardous materials/WMD incident, the responder assigned to use PPE shall complete the reporting and documentation requirements consistent with the emergency response plan or SOPs and identify the reports and supporting documentation required by the emergency response plan or SOPs.

4.6 Compiling Incident Reports. The BLS responder shall describe his or her role in compiling incident reports that meet federal, state, local, and organizational requirements, as follows:

(1) List the information to be gathered regarding the exposure of all patient(s) and describe the reporting procedures, including the following:
   (a) Detailed information on the substances released
   (b) Pertinent information on each patient treated and transported
   (c) Routes, extent, and duration of exposures
   (d) Actions taken to limit exposure
   (e) Decontamination activities

(2) At the conclusion of the hazardous materials/WMD incident, identify the methods used by the AHJ to evaluate transport units that might have been contaminated and the process and locations available to decontaminate those units.

Chapter 5 Competencies for Hazardous Materials/WMD Advanced Life Support (ALS) Responder

5.1 General.

5.1.1 Introduction. All EMS personnel at the hazardous materials/WMD ALS responder level, in addition to their ALS certification, shall be trained to meet at least the core competencies of the operations level responders as defined in Chap-

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ter 5 of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, and all competencies of this chapter.

5.1.2 Goal. The goal of the competencies at the ALS responder level shall be to provide the individual with the knowledge and skills necessary to safely deliver ALS at hazardous materials/WMD incidents and to function within the established incident command system, as follows:

(1) Analyze a hazardous materials/WMD incident to determine the potential health hazards encountered by the ALS level provider, other responders, and anticipated/actual patients by completing the following tasks:
   (a) Survey a hazardous materials/WMD incident to determine whether harmful substances have been released and to evaluate suspected and identified patients for telltale signs of exposure.
   (b) Collect hazard and response information from reference sources and technical experts on the scene, to determine the nature of the problem and potential health effects of the substances involved. *(See Annex B for a list of informational references.)*
   (c) Survey the hazardous materials/WMD scene for the presence of secondary devices and other potential hazards.

(2) Plan to deliver ALS to exposed patients, within the scope of practice and training competencies established by the AHJ, by completing the following tasks:
   (a) Evaluate preplans of high-risk areas/occupancies within the AHJ to identify potential locations where significant human exposures can occur.
   (b) Identify the capabilities of the hospital network within the AHJ to accept exposed patients and to perform emergency decontamination if required.
   (c) Evaluate the components of the incident communication plan within the AHJ.
   (d) Describe the role of the ALS level responder as it relates to the local emergency response plan and established incident management system.
   (e) Identify supplemental regional and national medical resources, including assets of the strategic national stockpile (SNS) and the metropolitan medical response system (MMRS).

(3) Implement a prehospital treatment plan for exposed patients, within the scope of practice and training competencies established by the AHJ, by completing the following tasks:
   (a) Determine the nature of the hazardous materials/WMD incident as it relates to anticipated or actual patient exposures and subsequent medical treatment.
   (b) Determine the need or effectiveness of decontamination prior to accepting an exposed patient.
   (c) Determine if the available medical equipment, transport units, and other supplies, including antidotes and therapeutic drugs, will meet or exceed patient care needs.
   (d) Describe the process of evidence preservation where criminal or terrorist acts are suspected or confirmed.
   (e) Develop and implement a medical monitoring plan for those responders operating in chemical protective clothing at a hazardous materials/WMD incident.
   (f) Evaluate the need to administer antidotes to reverse the effects of exposure in affected patients.

(4) Participate in the termination of the incident by completing the following tasks:
   (a) Participate in an incident debriefing.
   (b) Participate in an incident critique with the appropriate agencies.
   (c) Report and document the actions taken by the ALS level responder at the scene of the incident.

5.2 Competencies — Analyzing the Hazardous Materials Incident.

5.2.1 Surveying Hazardous Materials/WMD Incidents. Given scenarios of hazardous materials/WMD incidents, the ALS level responder shall assess the nature and severity of the incident as it relates to anticipated or actual EMS responsibilities at the scene.

5.2.1.1 Given examples of the following marked transport vehicles (and their corresponding shipping papers or identification systems) that can be involved in hazardous materials/WMD incidents, the ALS level responder shall evaluate the general health risks based on the physical and chemical properties of the anticipated contents:

(1) Highway transport vehicles, including cargo tanks
(2) Intermodal equipment, including tank containers
(3) Rail transport vehicles, including tank cars

5.2.1.2 Given examples of various hazardous materials/WMD incidents at fixed facilities, the ALS level responder shall demonstrate the ability to perform the following tasks:

(1) Identify a variety of containers and their markings, including bulk and nonbulk packages and containers, drums, underground and aboveground storage tanks, specialized storage tanks, or any other specialized containers found in the AHJ's geographic area, and evaluate the general health risks based on the physical and chemical properties of the anticipated contents.
(2) Identify the following job functions of health-related resource personnel available at fixed facility hazardous materials/WMD incidents:
   (a) Environmental heath and safety representatives
   (b) Radiation safety officers
   (c) Occupational physicians and nurses
   (d) Site emergency response teams
   (e) Specialized experts

5.2.1.3 The ALS level responder shall identify two ways to obtain a material safety data sheet (MSDS) at a hazardous materials/WMD incident and shall demonstrate the ability to identify the following health-related information:

(1) Proper chemical name or synonyms
(2) Physical and chemical properties
(3) Health hazards of the material
(4) Signs and symptoms of exposure
(5) Routes of entry
(6) Permissible exposure limits
(7) Emergency medical procedures or recommendations
(8) Responsible party contact

5.2.1.4 Given scenarios at various fixed facilities, transportation incidents, pipeline release scenarios, maritime incidents, or any other unexpected hazardous materials/WMD incident, the ALS level responder, working within an incident command system must evaluate the off-site consequences of the release, based on the physical and chemical nature of the released substance, and the prevailing environmental factors to

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determine the need to evacuate or shelter in place affected persons.

5.2.1.5 Given examples of the following biological threat agents, the ALS level responder shall define the various types of biological threat agents, including the signs and symptoms of exposure, mechanism of toxicity, incubation periods, possible disease patterns, and likely means of dissemination:

(1) Variola virus (smallpox)
(2) *Botulinum* toxin
(3) *E. coli* O157:H7
(4) Ricin toxin
(5) *B. anthracis* (anthrax)
(6) Venezuelan equine encephalitis virus
(7) *Rickettsia*
(8) *Yersinia pestis* (plague)
(9) Tularemia
(10) Viral hemorrhagic fever
(11) Other CDC Category A–listed organism or threat

5.2.1.6* Given examples of various types of hazardous materials/WMD incidents involving toxic industrial chemicals (TICs), toxic industrial materials (TIMs), blister agents, blood agents, nerve agents, choking agents and irritants, the ALS level responder shall determine the general health risks to patients exposed to those substances and identify those patients who may be candidates for antidotes.

5.2.1.7* Given examples of hazardous materials/WMD found at illicit laboratories, the ALS level responder shall identify general health hazards associated with the chemical substances that are expected to be encountered.

5.2.1.8 Given examples of a hazardous materials/WMD incident involving radioactive materials, including radiological dispersion devices, the ALS level responder shall determine the probable health risks and potential patient outcomes by completing the following tasks:

(1) Determine the types of radiation (alpha, beta, gamma, and neutron) and potential health effects of each.
(2) Determine the most likely exposure pathways for a given radiation exposure, including inhalation, ingestion, and direct skin exposure.
(3) Describe how the potential for cross contamination differs for electromagnetic waves compared to radioactive solids, liquids, or vapors.
(4) Identify priorities for decontamination in scenarios involving radioactive materials.
(5) Describe the manner in which acute medical illness or traumatic injury can influence decisions about decontamination and patient transport.

5.2.1.9 Given examples of typical labels found on pesticide containers, the ALS level responder shall define the following terms:

(1) Pesticide name
(2) Pesticide classification (e.g., insecticide, rodenticide, organophosphate, carbamate, organochlorine)
(3) Environmental Protection Agency (EPA) registration number
(4) Manufacturer name
(5) Ingredients broken down by percentage
(6) Cautionary statement (e.g., Danger, Warning, Caution, Keep from Waterways)
(7) Strength and concentration
(8) Treatment information

5.2.2 Collecting and Interpreting Hazard and Response Information. The ALS level responder shall demonstrate the ability to utilize various reference sources at a hazardous materials/WMD incident, including the following:

(1) MSDS
(2) CHEMTREC/CANUTEC/SETIQ
(3) Regional poison control centers
(4) DOT *Emergency Response Guidebook*
(5) NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response* identification system
(6) Hazardous Materials Information System (HMIS)
(7) Local, state, federal, and provincial authorities
(8) Shipper/manufacturer contacts
(9) Agency for Toxic Substances and Disease Registry (ATSDR) medical management guidelines
(10) Medical toxicologists
(11) Electronic databases

5.2.2.1 Identifying Secondary Devices. Given scenarios involving hazardous materials/WMD, the ALS level responders shall describe the importance of evaluating the scene for secondary devices prior to rendering patient care, including the following safety points:

(1) Evaluate the scene for likely areas where secondary devices can be placed.
(2) Visually scan operating areas for a secondary device before providing patient care.
(3) Avoid touching or moving anything that can conceal an explosive device.
(4) Designate and enforce scene control zones.
(5) Evacuate victims, other responders, and nonessential personnel as quickly and safely as possible.

5.3 Competencies — Planning the Response.

5.3.1 Identifying High-Risk Areas for Potential Exposures.

5.3.1.1 The ALS level responder, given an events calendar and pre-incident plans, which can include the local emergency planning committee plan as well as the agency's emergency response plan and SOPs, shall identify the venues for mass gatherings, industrial facilities, potential targets for terrorism, or any other locations where an accidental or intentional release of a harmful substance can pose an unreasonable health risk to any person within the local geographical area as determined by the AHJ and shall do the following:

(1) Identify locations where hazardous materials/WMD are used, stored, or transported.
(2) Identify areas and locations presenting a potential for a high loss of life or rate of injury in the event of an accidental/intentional release of a hazardous materials/WMD substance.
(3) Evaluate the geographic and environmental factors that can complicate a hazardous materials/WMD incident, including prevailing winds, water supply, vehicle and pedestrian traffic flow, ventilation systems, and other natural or man-made influences, including air and rail corridors.

5.3.2 Determining the Capabilities of the Local Hospital Network.

5.3.2.1 The ALS level responder shall identify the methods and vehicles available to transport hazardous materials patients and shall determine the location and potential routes of

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travel to the following appropriate local and regional hospitals, based on patient need:

(1) Adult trauma centers
(2) Pediatric trauma centers
(3) Adult burn centers
(4) Pediatric burn centers
(5) Hyperbaric chambers
(6) Established field hospitals
(7) Other specialty hospitals or medical centers

5.3.2.2 Given a list of local receiving hospitals in the AHJ's geographic area, the ALS level responder shall describe the location and availability of hospital-based decontamination facilities.

5.3.2.3 The ALS level responder shall describe the ALS protocols and SOPs developed by the AHJ and the prescribed role of medical control and poison control centers during mass casualty incidents, at hazardous materials/WMD incidents where exposures have occurred, and in the event of disrupted radio communications.

5.3.2.4 The ALS level responder shall identify the following mutual aid resources (hospital and nonhospital based) identified by the AHJ for the field management of multicasualty incidents.

(1) Mass-casualty trailers with medical supplies
(2) Mass-decedent capability
(3) Regional decontamination units
(4) Replenishment of medical supplies during long-term incidents
(5) Locations and availability of mass-casualty antidotes for selected exposures, including but not limited to the following:
    (a) Nerve agents and organophosphate pesticides
    (b) Biological agents and other toxins
    (c) Blood agents
    (d) Opiate exposures
    (e) Selected radiological exposures
(6) Rehabilitation units for the EMS responders
(7) Replacement transport units for those vehicles lost to mechanical trouble, collision, theft, and contamination

5.3.2.5 The ALS level responder shall identify the special hazards associated with inbound and outbound air transportation of patients exposed to hazardous materials/WMD.

5.3.2.6 The ALS level responder shall describe the available medical information resources concerning hazardous materials toxicology and response.

5.3.3 Identifying Incident Communications.

5.3.3.1 The ALS level responder shall identify the components of the communication plan within the AHJ geographic area and determine that the EMS providers have the ability to communicate with other responders on the scene, with transport units, and with local hospitals.

5.3.3.2 Given examples of various patient exposure scenarios, the ALS level responder shall describe the following information to be transmitted to the medical control or poison control center or the receiving hospital prior to arrival:

(1) The exact name of the substance(s) involved
(2) The physical and chemical properties of the substance(s) involved
(3) Number of victims being transported
(4) Age and sex of transported patients
(5) Patient condition and chief complaint
(6) Medical history
(7) Circumstances and history of the exposure, such as duration of exposure and primary route of exposure
(8) Vital signs, initial and current
(9) Symptoms described by the patient, initial and current
(10) Presence of associated injuries, such as burns and trauma
(11) Decontamination status
(12) Treatment rendered or in progress, including the effectiveness of antidotes administered
(13) Estimated time of arrival

5.3.4 Identifying the Role of the ALS Level Responder.

5.3.4.1 Given scenarios involving hazardous materials/WMD, the ALS level responder shall identify his or her role during hazardous materials/WMD incidents as specified in the emergency response plan and SOPs developed by the AHJ, as follows:

(1) Describe the purpose, benefits, and elements of the incident command system at it relates to the ALS level responder.
(2) Describe the typical incident command structure for the emergency medical component of a hazardous materials/WMD incident as specified in the emergency response plan and SOPs developed by the AHJ.
(3) Demonstrate the ability of the ALS level responder to function within the incident command system.
(4) Demonstrate the ability to implement an incident command system for a hazardous materials/WMD incident where an ICS does not currently exist.
(5) Identify the procedures for requesting additional resources at a hazardous materials/WMD incident.

5.3.4.2 Describe the hazardous materials/WMD ALS responder's role in the hazardous materials/WMD response plan developed by the AHJ or identified in the local emergency response plan as follows:

(1) Determine the toxic effect of hazardous materials/WMD.
(2) Estimate the number of patients.
(3) Recognize and assess the presence and severity of symptoms.
(4) Assess the impact on the health care system.
(5) Perform appropriate patient monitoring as follows:
    (a) Pulse oximetry
    (b) Cardiac monitor
    (c) End tidal CO_2
(6) Communicate pertinent information.
(7) Estimate pharmacological need.
(8) Address threat potential for clinical latency.
(9) Estimate dosage — exposure.
(10) Estimate dosage — treatment.
(11) Train in appropriate monitoring.

5.3.5 Supplemental Medical Resources. Given scenarios of various hazardous materials/WMD mass casualty incidents, the ALS level responder shall identify the supplemental medical resources available to the AHJ, including the following:

(1) Describe the strategic national stockpile (SNS) program, including the following components:
    (a) Intent and goals of the SNS program

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(b) Procedures and requirements for deploying the SNS to a local jurisdiction
(c) Typical supplies contained in 12-hour push package
(d) Role of the technical advisory response unit (TARU)

(2) Describe the metropolitan medical response system (MMRS) including the following components:
(a) Scope, intent, and goals of the MMRS
(b) Capabilities and resources of the MMRS
(c) Eight capability focus areas of the MMRS

5.4 Competencies — Implementing the Planned Response.

5.4.1 Determining the Nature of the Incident and Providing Medical Care. The ALS level responder shall demonstrate the ability to provide emergency medical care to those patients exposed to hazardous materials/WMD by completing the following tasks:

(1) The ALS level responder shall determine the physical state of the released substance and the environmental influences surrounding the release, as follows:
(a) Solid
(b) Liquid
(c) Gas, vapor, dust, mist, aerosol

(2)*The ALS level responder shall identify potential routes of exposure, and correlate those routes of exposure to the physical state of the released substance, to determine the origin of the illness or injury, as follows:
(a) Inhalation
(b) Absorption
(c) Ingestion
(d) Injection

(3) The ALS level responder shall describe the potential routes of entry into the body, the common signs and symptoms of exposure, and the ALS treatment options approved by the AHJ (e.g., advanced airway management, drug therapy), including antidote administration where appropriate, for exposure(s) to the following classification of substances:
(a) Corrosives
(b) Pesticides
(c) Chemical asphyxiants
(d) Simple asphyxiants
(e) Organic solvents
(f) Nerve agents
(g) Vesicants
(h) Blood agents
(i) Choking agents
(j) Irritants (riot control agents)
(k) Biological agents and toxins
(l) Incapacitating agents
(m) Radiological materials
(n) Nitrogen compounds
(o) Opiate compounds
(p) Fluorine compounds
(q) Phenolic compounds

(4) The ALS level responder shall describe the basic toxicological principles relative to assessment and treatment of persons exposed to hazardous materials, including the following:
(a) Acute and delayed toxicological effects
(b) Local and systemic effects
(c) Dose-response relationship

(5) Given examples of various hazardous substances, the ALS level responder shall define the basic toxicological terms as they relate to the treatment of an exposed patient, as follows:
(a) Threshold limit value — time weighted average (TLV-TWA)
(b) Lethal doses and concentrations, as follows:
i. LD_{lo}
ii. LD_{50}
iii. LD_{hi}
iv. LC_{lo}
v. LC_{50}
vi. LC_{hi}
(c) Parts per million/parts per billion/parts per trillion (ppm/ppb/ppt)
(d) Immediately dangerous to life and health (IDLH)
(e) Permissible exposure limit (PEL)
(f) Threshold limit value — short-term exposure limit (TLV-STEL)
(g) Threshold limit value — ceiling (TLV-C)
(h) Solubility
(i) Poison — a substance that causes injury, illness, or death
(j) Toxic — harmful nature related to amount and concentration

(6) Given examples of hazardous materials/WMD incidents with exposed patients, the ALS level responder shall evaluate the progress and effectiveness of the medical care provided at a hazardous materials/WMD incident, to ensure that the overall incident response objectives, along with patient care goals, are being met by completing the following tasks:
(a) Locate and track all exposed patients at a hazardous materials/WMD incident, from triage and treatment to transport to the appropriate hospital.
(b) Review the incident objectives at periodic intervals to ensure that patient care is being carried out within the overall incident response plan.
(c) Ensure that the incident command system forms are completed, along with the patient care forms required by the AHJ, during the course of the incident.
(d) Evaluate the need for trained and qualified EMS personnel, medical equipment, transport units, and other supplies, including antidotes based on the scope and duration of the incident.

5.4.2* Decontaminating Exposed Patients. Given the emergency response plan and SOPs developed by the AHJ and given examples of hazardous materials/WMD incidents with exposed patients, the ALS level responder shall do as follows:

(1) Given the emergency response plan and SOPs developed by the AHJ, identify and evaluate the patient decontamination activities performed prior to accepting responsibility for and transferring care of exposed patients.
(2) Determine the need and location for patient decontamination, including mass-casualty decontamination, in the event none has been performed prior to arrival of EMS personnel, and complete the following tasks:
(a) Given the emergency response plan and SOPs developed by the AHJ, identify and evaluate the patient decontamination activities performed prior to accepting responsibility for and transferring care of exposed patients; identify sources of information for determining the appropriate decontamination procedure and how

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to access those resources in a hazardous materials/WMD incident.

(b) Given the emergency response plan and SOPs developed by the AHJ, identify and evaluate the patient decontamination activities performed prior to accepting responsibility for and transferring care of exposed patients.

(c) Given the emergency response plan and SOPs provided by the AHJ, identify the supplies and equipment required to set up and implement technical or mass-casualty decontamination operations for ambulatory and nonambulatory patients.

(d) Given the emergency response plan and SOPs developed by the AHJ, identify the procedures, equipment, and safety precautions for securing evidence during decontamination operations at hazardous materials/WMD incidents.

(e) Identify procedures, equipment, and safety precautions for handling tools, equipment, weapons, and law enforcement and K-9 search dogs brought to the decontamination corridor at hazardous materials/WMD incidents.

(f) Identify procedures, equipment, and safety precautions for communicating with critically, urgently, and potentially exposed patients, and population prioritization and management techniques.

(g) Determine the threat of cross contamination to all responders and patients by completing the following tasks:

i. Identify hazardous materials/WMD with a high risk of cross contamination.

ii. Identify hazardous materials/WMD agents with a low risk of cross contamination.

iii. Describe how the physical state of the hazardous materials/WMD provides clues to its potential for secondary contamination, when the exact identity of the hazardous materials/WMD is not known.

5.4.3 Evaluating the Need for Medical Supplies. Given examples of single-patient and multicasualty hazardous materials/WMD incidents, the ALS level responder shall determine if the available medical equipment, transport units, and other supplies, including antidotes, will meet or exceed expected patient care needs throughout the duration of the incident.

5.4.4 Evidence Preservation. Given examples of hazardous materials/WMD incidents where criminal acts are suspected, the ALS level responder shall make every attempt to preserve evidence during the course of delivering patient care by completing the following tasks:

(1) Determine if the incident is potentially criminal in nature and cooperate with the law enforcement agency having investigative jurisdiction.

(2) Identify the unique aspects of criminal hazardous materials/WMD incidents, including crime scene preservation, evidence preservation, and destruction of potential evidence found on medical patients, and/or the destruction of evidence during the decontamination process.

(3) Ensure that any information regarding suspects, sequence of events during a potential criminal act, or observations made based on patient presentation or during patient assessment are documented and communicated and passed on to the law enforcement agency having investigative jurisdiction.

5.4.5 Medical Support at Hazardous Materials/WMD Incidents. Given the emergency response plan and SOPs developed by the AHJ and examples of various hazardous materials/WMD incidents, the ALS level responder shall describe the procedures for performing medical support of hazardous materials/WMD incident response personnel, and shall complete the following tasks:

(1) The ALS level responder responsible for pre-entry medical monitoring shall obtain hazard and toxicity information on the released substance from the designated hazardous materials technical reference resource or other reliable sources of information at the scene. The following information shall be conveyed to the entry team, incident safety officer, hazardous materials officer, other EMS personnel at the scene, and any other responders responsible for the health and well-being of those personnel operating at the scene:

(a) Chemical name
(b) Hazard class
(c) Hazard and toxicity information
(d) Applicable decontamination methods and procedures
(e) Potential for secondary contamination
(f) Procedure for transfer of patients from the constraints of the incident to the emergency medical system
(g) Prehospital management of medical emergencies and exposures, including antidote administration

(2) The ALS level responder shall evaluate the pre-entry health status of hazardous materials/WMD responders prior to donning PPE by performing the following tasks:

(a) Record a full set of vital signs
(b) Record body weight measurements
(c) Record general health observations

(3) The ALS level responder shall determine the medical fitness of those personnel charged with donning chemical protective clothing, using the criteria set forth in the emergency action plan (EAP) and the SOP developed by the AHJ. Consideration shall be given to excluding responders if they do not meet the following criteria prior to working in chemical protective clothing:

(a) Core body temperature: hypothermia/hyperthermia
(b) Blood pressure: hypotension/hypertension
(c) Heart rate: bradycardia/tachycardia
(d) Respiratory rate: bradypnea/tachypnea

(4) The ALS level responder shall determine how the following factors influence heat stress on hazardous materials/WMD response personnel:

(a) Baseline level of hydration
(b) Underlying physical fitness
(c) Environmental factors
(d) Activity levels during the entry
(e) Level of PPE worn
(f) Duration of entry
(g) Cold stress

(5) Given examples of various hazardous materials/WMD incidents requiring the use of chemical protective ensembles, the ALS level responder shall complete the following tasks:

(a) Demonstrate the ability to set up and operate a medical monitoring station.

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(b) Demonstrate the ability to recognize the signs and symptoms of heat stress, heat exhaustion, and heat stroke.
(c) Determine the ALS needs for responders exhibiting the effects of heat stress, cold stress, and heat exhaustion.
(d) Describe the medical significance of heat stroke and the importance of rapid transport to an appropriate medical receiving facility.

(6) Given a simulated hazardous materials/WMD incident, the ALS level responder shall demonstrate documentation of medical monitoring activities.
(7) The ALS level responder shall evaluate all team members after decontamination and PPE removal, using the following criteria:
(a) Pulse rate — done within the first minute
(b) Pulse rate — 3 minutes after initial evaluation
(c) Temperature
(d) Body weight
(e) Blood pressure
(f) Respiratory rate
(8) The ALS level responder shall recommend that any hazardous materials team member exhibiting any of the following signs be prohibited from redonning chemical protective clothing:
(a) Heat stress or heat exhaustion
(b) Pulse rate: tachycardia/bradycardia
(c) Core body temperature: hyperthermia/hypothermia
(d) Recovery heart rate with a trend toward normal rate and rhythm
(e) Blood pressure: hypertension/hypotension
(f) Weight loss of >5 percent
(g) Signs or symptoms of extreme heat exhaustion or heat stroke, which requires transport by ALS ambulance to the appropriate hospital
(9) The ALS level responder shall notify immediately the appropriate persons designated by the emergency response plan if a team member requires significant medical treatment or transport (arranged through the appropriate designee identified by the emergency response plan).

5.5 Competencies — Terminating the Incident. Upon termination of the hazardous materials/WMD incident, the ALS level responder shall complete the reporting, documentation, and EMS termination activities as required by the local emergency response plan or the organization's SOPs and shall meet the following requirements:

(1) Identify the reports and supporting documentation required by the emergency response plan or SOPs.
(2) Demonstrate completion of the reports required by the emergency response plan or SOPs.
(3) Describe the importance of personnel exposure records.
(4) Describe the importance of debriefing records.
(5) Describe the importance of critique records.
(6) Identify the steps in keeping an activity log and exposure records.
(7) Identify the steps to be taken in compiling incident reports that meet federal, state, local, and organizational requirements.
(8) Identify the requirements for compiling personal protective equipment logs.
(9) Identify the requirements for filing documents and maintaining records, as follows:
(a) List the information to be gathered regarding the exposure of all patient(s) and describe the reporting procedures, including the following:
i. Detailed information on the substances released
ii. Pertinent information on each patient treated or transported
iii. Routes, extent, and duration of exposures
iv. Actions taken to limit exposure
v. Decontamination activities
(b) Identify the methods used by the AHJ to evaluate transport units for potential contamination and the process and locations available to decontaminate those units.

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.1.3 The CDC categories of bioterrorism diseases and agents are as follows (for more information, see the CDC website www.bt.cdc.gov):

(1) Category A
(a) Anthrax (*Bacillus anthracis*)
(b) Botulism (*Clostridium botulinum* toxin)
(c) Plague (*Yersinia pestis*)
(d) Smallpox (variola major)
(e) Tularemia (*Francisella tularensis*)
(f) Viral hemorrhagic fevers (filoviruses [e.g., Ebola, Marburg] and arenaviruses [e.g., Lassa, Machupo])
(2) Category B
(a) Brucellosis (*Brucella* species)
(b) Epsilon toxin of *Clostridium perfringens*
(c) Food safety threats (e.g., *Salmonella* species, *Escherichia coli* O157:H7, *Shigella*)
(d) Glanders (*Burkholderia mallei*)
(e) Melioidosis (*Burkholderia pseudomallei*)
(f) Psittacosis (*Chlamydia psittaci*)
(g) Q fever (*Coxiella burnetii*)
(h) Ricin toxin from *Ricinus communis* (castor beans)
(i) Staphylococcal enterotoxin B
(j) Typhus fever (*Rickettsia prowazekii*)
(k) Viral encephalitis [alphaviruses (e.g., Venezuelan equine encephalitis, eastern equine encephalitis, western equine encephalitis)]
(l) Water safety threats (e.g., *Vibrio cholerae*, *Cryptosporidium parvum*)
(3) Category C — emerging infectious diseases, such as Nipah virus and hantavirus

Category A Diseases/Agents. The U.S. public health system and primary healthcare providers must be prepared to address various biological agents, including pathogens that are rarely seen in the United States. These high-priority agents include organisms that pose a risk to national security because of the following:

(1) They can be easily disseminated or transmitted from person to person.
(2) They result in high mortality rates and have the potential for major public health impact.

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(3) They might cause public panic and social disruption.
(4) They require special action for public health preparedness.

Category B Diseases/Agents. These second-highest priority agents have the following characteristics:

(1) They are moderately easy to disseminate.
(2) They result in moderate morbidity rates and low mortality rates.
(3) They require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

Category C Diseases/Agents. These third-highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of the following characteristics:

(1) Availability
(2) Ease of production and dissemination
(3) Potential for high morbidity and mortality rates and major health impact

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.3.2.3 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.2.1 Emergency Care First Responder (ECFR). In Canada, the terminology used is Emergency Medical Assistant-1 (EMA-1), Emergency Medical Assistant-2 (EMA-2), and Emergency Medical Assistant-3 (EMA-3).

A.3.3.4 Components of Emergency Medical Service (EMS) System. These components include the following:

(1) First responders
(2) Emergency dispatching
(3) EMS agency response
(4) Hospital emergency departments
(5) Specialized care facilities

A.3.3.7 Demonstrate. This performance can be supplemented by simulation, explanation, illustration, or a combination of these.

A.3.3.12 Hazardous Material. Other criminal use of hazardous materials includes CBRNE, or chemical, biological, radiological, nuclear, and high yield explosives.

A.3.3.15 Incident Commander (IC). This position is equivalent to the on-scene incident commander. The IC has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site.

A.3.3.17 Incident Management System (IMS). The IMS provides a consistent approach for all levels of government, private sector, and volunteer organizations to work together effectively and efficiently to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity. An IMS provides for interoperability and compatibility among all levels of government, private sector, and volunteer organization capabilities. The IMS includes a core set of concepts, principles, terminology, and technologies covering the ICS, multiagency coordination systems, training, and identification and management of resources.

A.4.2.1.7(1) Examples of products involved in illicit drug manufacturing include the following:

(1) Ammonia
(2) Ephedrine and pseudoephedrine
(3) Flammable solvents such as ether compounds and methanol
(4) Fluorinated/chlorinated hydrocarbons (Freon)
(5) Hydrogen chloride
(6) Aluminum chloride
(7) Iodine
(8) Lithium or sodium metal
(9) Phosphine gas
(10) Red phosphorus
(11) Sodium hydroxide or other caustic substances

A.4.2.2(4) CHEMTREC, the Chemical Transportation Emergency Center, is a round-the-clock resource for obtaining immediate emergency response information for accidental chemical releases. CANUTEC, the Canadian Transport Emergency Centre, is operated by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies. SETIQ is the Mexican Emergency Transportation System for the Chemical Industry.

A.4.3.1.1(3) External factors can include geographic, environmental, mechanical, and transportation factors such as prevailing winds, water supply, vehicle and pedestrian traffic flow, ventilation systems, and other natural or man-made influences, including air and rail corridors.

A.4.4.1(3) Examples of classified substances include the following:

(1) Acids, alkalis, and corrosives
(2) Fumigants and pesticides: organophosphates, carbamates, zinc or aluminum phosphide, strychnine, sulfuryl fluoride
(3) Chemical asphyxiants: cyanide, carbon monoxide, hydrogen sulfide
(4) Simple asphyxiants: nitrogen, helium

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(5) Organic solvents: xylene, benzene, methylene chloride
(6) Nerve agents: Tabun, Sarin, Soman, V agent
(7) Vesicants and blister agents: mustard, Lewisite
(8) Blood agents: cyanide, cyanogen chloride, arsine
(9) Choking agents: ammonia, chlorine, diphosgene, phosgene
(10) Pepper spray, irritants, and riot-control agents: CS (orthochlorobenzalmalononitrile), CN (chloroacetophenone), CR (dibenzoxazepine), MACE (phenylchloromethylketone), OC (oleoresin capsicum)
(11) Biological agents and toxins: anthrax, mycotoxin, plague, viral hemorraghic fevers, smallpox, ricin
(12) Incapacitating agents: BZ, LSD
(13) Radiological materials: plutonium, cesium, iridium, technetium
(14) Nitrogen-containing compounds: aniline, nitrates
(15) Opiate compounds: fentanyl, morphine
(16) Fluorine compounds: hydrogen fluoride, hydrofluoric acid
(17) Phenolic compounds: carbolic acid, cresylic acid

A.4.4.5(7)(f) Regarding the issue of weighing individuals, recent medical research has focused on the concerns relating to water consumption and the difficulty in managing oral fluid intake. Often the distinction of water intoxication and resulting hyponatremia versus dehydration from insufficient water consumption, especially during sustained and prolonged operations, cannot be determined by vital sign measurements alone in the prehospital setting. One invaluable measure in making this distinction is a comparison weight of the individual prior to and following entry and re-entry to the operational theater. It is for this reason that comparison weighing is an included recommendation for evaluation of fitness.

A.5.2.1.6 Examples of toxic industrial materials are corrosives, reproductive hazards, carcinogens, flammable hazards, and explosive hazards.

A.5.2.1.7 Examples of hazardous materials at illicit laboratories are as follows:

(1) Ammonia
(2) Ephedrine and pseudoephedrine
(3) Flammable solvents such as ether compounds and methanol
(4) Fluorinated/chlorinated hydrocarbons (Freon)
(5) Hydrogen chloride
(6) Iodine
(7) Lithium or sodium metal
(8) Phosphine gas
(9) Red phosphorus
(10) Sodium hydroxide or other caustic substances

A.5.4.1(2) See A.4.4.1(3)(3).

A.5.4.2 Most ALS medical treatment at hazardous materials/WMD incidents will be delivered in the cold zone, after decontamination. In some cases, ALS level skills need to be delivered in the warm or hot zone prior to or concurrent with decontamination. In those situations, ALS level providers need to balance the need for performing life-saving interventions with decontamination, taking into consideration the nature and severity of the incident; the medical needs of the patient; and the need to perform decontamination prior to rendering care.

Life safety of the responder is paramount. ALS level responders who anticipate functioning under these conditions should receive training and meet the mission-specific personal protective equipment competencies as defined in Section 6.2 of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.*

It is critical that EMS providers review their responsibilities within their local emergency response plan before an incident occurs to ensure that EMS responders are adequately trained for their expected roles within the Incident Management System at the hazardous materials/WMD incident. The priorities for triage, treatment, or decontamination in the setting of other significant injuries should be based on the following requirements:

(1) *Priority I — Medical Care First.* Medical care outweighs immediate decontamination, and patients should be grossly decontaminated only as priority to transport. Contaminated patients with serious or critical illness, trauma, or burns should be decontaminated while their life-threatening injuries are being addressed.
(2) *Priority II — Combined Priorities.* Medical care needs are balanced with a priority to decontaminate. These patients present with a serious illness other than from the chemical exposure, have trauma or burn injuries, and have not been decontaminated but might have a high level of contamination. There might be a risk to the EMS provider from an ongoing exposure to the hazardous substance. In this situation, it might not be safe to render medical care without the appropriate personal protective equipment. The ABCs (airway/breathing/circulation) and threats to life should be managed along with rapid decontamination.
(3) *Priority III — Decontaminate First.* Decontamination should be performed prior to providing medical care. In this situation, it might not be safe to render medical care without the appropriate personal protective equipment.

Patient conditions are categorized as follows:

(1) A = Critical condition: airway compromised, serious signs or symptoms of shock, cardiac arrest, life-threatening trauma or burns
(2) B = Unstable condition: shortness of breath, unstable vital signs, altered level of consciousness after the exposure, significant trauma or burns
(3) C = Stable condition: stable vital signs, no altered level of consciousness, no significant trauma or burns

See Table A.5.4.2.

Table A.5.4.2 Patient Priority Levels

Level of Contamination	Priority Based on Condition		
	Medically Critical (A)	Medically Unstable (B)	Medically Stable (C)
Heavily contaminated with highly toxic substance	II	III	III
Heavily contaminated with low-toxicity substance	I	II	II
Low-level contamination with highly toxic substance	II	III	III
Low-level contamination with low-toxicity substance	I	I	II
Chemical in eyes: Decontaminate eyes immediately and thoroughly.			

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Annex B Informational References

B.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

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

NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, 2008 edition.

B.1.2 Other Publications. (Reserved)

B.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

B.2.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2005 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2008 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2008 edition.

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

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

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

Hazardous Materials Response Handbook, 2008.

B.2.2 Other Publications.

B.2.2.1 ACC Publications. American Chemistry Council (formerly Chemical Manufacturers Association), 1300 Wilson Blvd., Arlington, VA 22209.

Recommended Terms for Personal Protective Equipment, 1985.

B.2.2.2 API Publications. American Petroleum Institute, 1220 L Street, N.W., Washington, DC 20005-4070.

API 2021, *Guide for Fighting Fires in and Around Flammable and Combustible Liquid Atmospheric Petroleum Storage Tanks*, 2001.

API 2510-A, *Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities*, 1996.

B.2.2.3 NFA Publications. National Fire Academy, Federal Emergency Management Agency, Emmitsburg, MD 21727.

Hazardous Materials Incident Analysis, 1984.

B.2.2.4 NRT Publications. National Response Team, National Oil and Hazardous Substances Contingency Plan, Washington, DC 20593.

NRT-1, *Hazardous Materials Emergency Planning Guide*, 2001.

B.2.2.5 U.S. Government Publications. U.S. Government Printing Office, Superintendent of Documents, Washington, DC 20402.

Title 29, Code of Federal Regulations, Parts 1910.119–1910.120.

Title 40, Code of Federal Regulations, Part 261.33.

Title 40, Code of Federal Regulations, Part 302.

Title 40, Code of Federal Regulations, Part 355.

Title 49, Code of Federal Regulations, Parts 170–180.

Emergency Response Guidebook, U.S. Department of Transportation, 2004 edition.

Emergency Response, Command, and Planning Guidelines (various documents) for terrorist incidents involving chemical and biological agents. U. S. Army Research, Development, and Engineering Command (RDECOM), available through the Edgewood Chemical Biological Center, website http://www.ecbc.army.mil/hld.

B.2.2.6 Additional Publications.

EPA, Emergency Response Program publications, Washington, DC: Environmental Protection Agency, www.epa.gov.

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B.3 References for Extracts in Informational Sections. (Reserved)

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Sequence of Events Leading to Issuance of an NFPA Committee Document

Step 1: Call for Proposals

- Proposed new Document or new edition of an existing Document is entered into one of two yearly revision cycles, and a Call for Proposals is published.

Step 2: Report on Proposals (ROP)

- Committee meets to act on Proposals, to develop its own Proposals, and to prepare its Report.
- Committee votes by written ballot on Proposals. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
- Report on Proposals (ROP) is published for public review and comment.

Step 3: Report on Comments (ROC)

- Committee meets to act on Public Comments to develop its own Comments, and to prepare its report.
- Committee votes by written ballot on Comments. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
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Step 4: Technical Report Session

- "*Notices of intent to make a motion"* are filed, are reviewed, and valid motions are certified for presentation at the Technical Report Session. ("Consent Documents" that have no certified motions bypass the Technical Report Session and proceed to the Standards Council for issuance.)
- NFPA membership meets each June at the Annual Meeting Technical Report Session and acts on Technical Committee Reports (ROP and ROC) for Documents with "certified amending motions."
- Committee(s) vote on any amendments to Report approved at NFPA Annual Membership Meeting.

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3.3.78 Effective Ground-Fault Current Path. An intentionally constructed, permanent, low impedance electrically conductive path designed and intended to carry ~~underground~~ electric fault current ~~conditions~~ from the point of a ground fault on a wiring system to the electrical supply source.

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