

## **Summary of NFPA 472 Core Competencies in Relation to the Hazardous Materials Performance Grant**

Based on the US Department of Transportation's rules, all training proposed under the Hazardous Materials Performance Grant (HMEP) must meet the standard within the core competencies of NFPA 472. The standard identifies the minimum levels of competence required by responders to emergencies involving hazardous materials/weapons of mass destruction. Within your HMEP grant proposal you must clearly explain the training and identify which competency it falls under.

This document is a summary of the standards/competencies which typically fall within the training proposals for HMEP. The NFPA 472 does contain additional competencies and you may review those in the original document if necessary.

### **Chapter 4 Competencies for Awareness Level**

#### **Personnel**

##### **4.1 General.**

##### **4.1.1 Introduction.**

**4.1.1.1** Awareness level personnel shall be persons who, in the course of their normal duties, could encounter an emergency involving hazardous materials/weapons of mass destruction (WMD) and who are expected to recognize the presence of the hazardous materials/WMD, protect themselves, call for trained personnel, and secure the area.

**4.1.1.2** Awareness level personnel shall be trained to meet all competencies of this chapter.

**4.1.1.3** Awareness level personnel shall receive additional training to meet applicable governmental occupational health and safety regulations.

##### **4.1.2 Goal.**

**4.1.2.1** The goal of the competencies in this chapter shall be to provide personnel already on the scene of a hazardous materials/WMD incident with the knowledge and skills to perform the tasks in 4.1.2.2 safely and effectively.

**4.1.2.2** When already on the scene of a hazardous materials/WMD incident, the awareness level personnel shall be able to perform the following tasks:

(1) Analyze the incident to determine both the hazardous materials/WMD present and the basic hazard and response information for each hazardous materials/WMD agent by completing the following tasks:

(a) Detect the presence of hazardous materials/WMD.

(b) Survey a hazardous materials/WMD incident from a safe location to identify the name, UN/NA identification number, type of placard, or other distinctive marking applied for the hazardous materials/WMD involved.

(c) Collect hazard information from the current edition of the DOT *Emergency Response Guidebook*.

(2) Implement actions consistent with the authority having jurisdiction (AHJ), and the current edition of the DOT *Emergency Response Guidebook* by completing the following tasks:

(a) Initiate protective actions

(b) Initiate the notification process

##### **4.2 Competencies —Analyzing the Incident.**

##### **4.2.1\* Detecting the Presence of Hazardous Materials/WMD.**

Given examples of various situations, awareness level personnel shall identify those situations where hazardous materials/WMD are present by completing the following requirements:

(1)\*Identify the definitions of both *hazardous material* (or *dangerous goods*, in Canada) and *WMD*

(2) Identify the UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division (3)\*Identify the primary hazards associated with each UN/DOT hazard class and division (4) Identify the difference between hazardous materials/WMD incidents and other emergencies

(5) Identify typical occupancies and locations in the community where hazardous materials/WMD are manufactured, transported, stored, used, or disposed of

(6) Identify typical container shapes that can indicate the presence of hazardous materials/WMD

(7) Identify facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:

(a) Transportation markings, including UN/NA identification number marks, marine pollutant mark, elevated temperature (HOT) mark, commodity marking, and inhalation hazard mark

(b) NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, markings

(c)\*Military hazardous materials/WMD markings

(d) Special hazard communication markings for each hazard class

(e) Pipeline markings

- (f) Container markings
- (8) Given an NFPA704 marking, describe the significance of the colors, numbers, and special symbols
- (9) Identify U.S. and Canadian placards and labels that indicate hazardous materials/WMD
- (10) Identify the following basic information on material safety data sheets (MSDS) and shipping papers for hazardous materials:
  - (a) Identify where to find MSDS
  - (b) Identify major sections of an MSDS
  - (c) Identify the entries on shipping papers that indicate the presence of hazardous materials
  - (d) Match the name of the shipping papers found in transportation (air, highway, rail, and water) with the mode of transportation
  - (e) Identify the person responsible for having the shipping papers in each mode of transportation
  - (f) Identify where the shipping papers are found in each mode of transportation
  - (g) Identify where the papers can be found in an emergency in each mode of transportation
- (11)\*Identify examples of clues (other than occupancy/location, container shape, markings/color, placards/ labels, MSDS, and shipping papers) to include sight, sound, and odor of which indicate hazardous materials/WMD
- (12) Describe the limitations of using the senses in determining the presence or absence of hazardous materials/WMD
- (13)\*Identify at least four types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD
- (14)\*Describe the difference between a chemical and a biological incident
- (15)\*Identify at least four indicators of possible criminal or terrorist activity involving chemical agents
- (16)\*Identify at least four indicators of possible criminal or terrorist activity involving biological agents
- (17) Identify at least four indicators of possible criminal or terrorist activity involving radiological agents
- (18) Identify at least four indicators of possible criminal or terrorist activity involving illicit laboratories (clandestine laboratories, weapons lab, ricin lab)
- (19) Identify at least four indicators of possible criminal or terrorist activity involving explosives
- (20)\*Identify at least four indicators of secondary devices

**4.2.2 Surveying Hazardous Materials/WMD Incidents.** Given examples of hazardous materials/WMD incidents, awareness level personnel shall, from a safe location, identify the hazardous material(s)/WMD involved in each situation by name, UN/NA identification number, or type placard applied by completing the following requirements:

- (1) Identify difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in transportation
- (2) Identify sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation
- (3) Identify sources for obtaining the names of hazardous materials/WMD at a facility

**4.2.3\* Collecting Hazard Information.** Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), awareness level personnel shall identify the fire, explosion, and health hazard information for each material by using the current edition of the DOT *Emergency Response Guidebook* by completing the following requirements:

- (1)\*Identify the three methods for determining the guidebook page for a hazardous material/WMD
- (2) Identify the two general types of hazards found on each guidebook page

**4.3\* Competencies — Planning the Response. (Reserved)**

**4.4 Competencies — Implementing the Planned Response.**

**4.4.1\* Initiating Protective Actions.** Given examples of hazardous materials/WMD incidents, the emergency response plan, the standard operating procedures, and the current edition of the DOT *Emergency Response Guidebook*, awareness level personnel shall be able to identify the actions to be taken to protect themselves and others and to control access to the scene by completing the following requirements:

- (1) Identify the location of both the emergency response plan and/or standard operating procedures
- (2) Identify the role of the awareness level personnel during hazardous materials/WMD incidents
- (3) Identify the following basic precautions to be taken to protect themselves and others in hazardous materials/WMD incidents:

- (a) Identify the precautions necessary when providing emergency medical care to victims of hazardous materials/WMD incidents
- (b) Identify typical ignition sources found at the scene of hazardous materials/WMD incidents
- (c)\*Identify the ways hazardous materials/WMD are harmful to people, the environment, and property
- (d)\*Identify the general routes of entry for human exposure to hazardous materials/WMD

(4)\*Given examples of hazardous materials/WMD and the identity of each hazardous material/WMD (name, UN/NA identification number, or type placard), identify the following response information:

- (a) Emergency action (fire, spill, or leak and first aid)
- (b) Personal protective equipment necessary
- (c) Initial isolation and protective action distances

(5) Given the name of a hazardous material, identify the recommended personal protective equipment from the following list:

- (a) Street clothing and work uniforms
- (b) Structural fire-fighting protective clothing
- (c) Positive pressure self-contained breathing apparatus
- (d) Chemical-protective clothing and equipment
- (6) Identify the definitions for each of the following protective actions:
  - (a) Isolation of the hazard area and denial of entry
  - (b) Evacuation
  - (c)\*Shelter-in-place
- (7) Identify the size and shape of recommended initial isolation and protective action zones
- (8) Describe the difference between small and large spills as found in the Table of Initial Isolation and Protective Action Distances in the DOT *Emergency Response Guidebook*
- (9) Identify the circumstances under which the following distances are used at a hazardous materials/WMD incidents:
  - (a) Table of Initial Isolation and Protective Action Distances
  - (b) Isolation distances in the numbered guides
- (10) Describe the difference between the isolation distances on the orange-bordered guidebook pages and the protective action distances on the green-bordered ERG(*Emergency Response Guidebook*) pages
- (11) Identify the techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials/WMD incidents
- (12)\*Identify at least four specific actions necessary when an incident is suspected to involve criminal or terrorist activity

**4.4.2 Initiating the Notification Process.** Given scenarios involving hazardous materials/WMD incidents, awareness level personnel shall identify the initial notifications to be made and how to make them, consistent with the AHJ.

**4.5\* Competencies — Evaluating Progress. (Reserved)**

**4.6\* Competencies — Terminating the Incident. (Reserved)**

## Chapter 5 Core Competencies for Operations Level Responders

### 5.1 General.

#### 5.1.1 Introduction.

**5.1.1.1\*** The operations level responder shall be that person who responds to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of protecting nearby persons, the environment, or property from the effects of the release.

**5.1.1.2** The operations level responder shall be trained to meet all competencies at the awareness level (*see Chapter 4*) and the competencies of this chapter.

**5.1.1.3\*** The operations level responder shall receive additional training to meet applicable governmental occupational health and safety regulations.

#### 5.1.2 Goal.

**5.1.2.1** The goal of the competencies in this chapter shall be to provide operations level responders with the knowledge and skills to perform the core competencies in 5.1.2.2 safely.

**5.1.2.2** When responding to hazardous materials/WMD incidents, operations level responders shall be able to perform the following tasks:

- (1) Analyze a hazardous materials/WMD incident to determine the scope of the problem and potential outcomes by completing the following tasks:
  - (a) Survey a hazardous materials/WMD incident to identify the containers and materials involved, determine whether hazardous materials/WMD have been released, and evaluate the surrounding conditions
  - (b) Collect hazard and response information from MSDS; CHEMTREC/CANUTEC/SETIQ; local, state, and federal authorities; and shipper/manufacturer contacts
  - (c) Predict the likely behavior of a hazardous material/WMD and its container
  - (d) Estimate the potential harm at a hazardous materials/WMD incident
- (2) Plan an initial response to a hazardous materials/WMD incident within the capabilities and competencies of available personnel and personal protective equipment by completing the following tasks:
  - (a) Describe the response objectives for the hazardous materials/WMD incident
  - (b) Describe the response options available for each objective
  - (c) Determine whether the personal protective equipment provided is appropriate for implementing each option
  - (d) Describe emergency decontamination procedures
  - (e) Develop a plan of action, including safety considerations
- (3) Implement the planned response for a hazardous materials/WMD incident to favorably change the outcomes consistent with the emergency response plan and/or standard operating procedures by completing the following tasks:

- (a) Establish and enforce scene control procedures, including control zones, emergency decontamination, and communications
  - (b) Where criminal or terrorist acts are suspected, establish means of evidence preservation
  - (c) Initiate an incident command system (ICS) for hazardous materials/WMD incidents
  - (d) Perform tasks assigned as identified in the incident action plan
  - (e) Demonstrate emergency decontamination
- (4) Evaluate the progress of the actions taken at a hazardous materials/WMD incident to ensure that the response objectives are being met safely, effectively, and efficiently by completing the following tasks:
- (a) Evaluate the status of the actions taken in accomplishing the response objectives
  - (b) Communicate the status of the planned response

**5.2 Core Competencies —Analyzing the Incident.**

**5.2.1\* Surveying Hazardous Materials/WMD Incidents.** Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall collect information about the incident to identify the containers, the materials involved, the surrounding conditions, and whether hazardous materials/WMD have been released by completing the requirements of 5.2.1.1 through 5.2.1.6.

**5.2.1.1\*** Given three examples each of liquid, gas, and solid hazardous material or WMD, including various hazard classes, operations level personnel shall identify the general shapes of containers in which the hazardous materials/WMD are typically found.

**5.2.1.1.1** Given examples of the following tank cars, the operations level responder shall identify each tank car by type, as follows:

- (1) Cryogenic liquid tank cars
- (2) Non-pressure tank cars (general service or low pressure cars)
- (3) Pressure tank cars

**5.2.1.1.2** Given examples of the following intermodal tanks, the operations level responder shall identify each intermodal tank by type, as follows:

- (1) Non-pressure intermodal tanks
- (2) Pressure intermodal tanks
- (3) Specialized intermodal tanks, including the following:
  - (a) Cryogenic intermodal tanks
  - (b) Tube modules

**5.2.1.1.3** Given examples of the following cargo tanks, the operations level responder shall identify each cargo tank by type, as follows:

- (1) Compressed gas tube trailers
- (2) Corrosive liquid tanks
- (3) Cryogenic liquid tanks
- (4) Dry bulk cargo tanks
- (5) High pressure tanks
- (6) Low pressure chemical tanks
- (7) Non-pressure liquid tanks

**5.2.1.1.4** Given examples of the following storage tanks, the operations level responder shall identify each tank by type, as follows:

- (1) Cryogenic liquid tank
- (2) Non-pressure tank
- (3) Pressure tank

**5.2.1.1.5** Given examples of the following non-bulk packaging, the operations level responder shall identify each package by type, as follows:

- (1) Bags
- (2) Carboys
- (3) Cylinders
- (4) Drums
- (5) Dewar flask (cryogenic liquids)

**5.2.1.1.6** Given examples of the following packaging, the operations level responder shall identify the characteristics of each container or package by type as follows:

- (1) Intermediate bulk container (IBC)
- (2) Ton container

**5.2.1.1.7\*** Given examples of the following radioactive material packages, the operations level responder shall identify the characteristics of each container or package by type, as follows:

- (1) Excepted
- (2) Industrial
- (3) Type A
- (4) Type B

(5) Type C

**5.2.1.2** Given examples of containers, the operations level responder shall identify the markings that differentiate one container from another.

**5.2.1.2.1** Given examples of the following marked transport vehicles and their corresponding shipping papers, the operations level responder shall identify the following vehicle or tank identification marking:

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

**5.2.1.2.2** Given examples of facility containers, the operations level responder shall identify the markings indicating container size, product contained, and/or site identification numbers.

**5.2.1.3** Given examples of hazardous materials incidents, the operations level responder shall identify the name(s) of the hazardous material(s) in 5.2.1.3.1 through 5.2.1.3.3.

**5.2.1.3.1** The operations level responder shall identify the following information on a pipeline marker:

- (1) Emergency telephone number
- (2) Owner
- (3) Product

**5.2.1.3.2** Given a pesticide label, the operations level responder shall identify each of the following pieces of information, then match the piece of information to its significance in surveying hazardous materials incidents:

- (1) Active ingredient
- (2) Hazard statement
- (3) Name of pesticide
- (4) Pest control product (PCP) number (in Canada)
- (5) Precautionary statement
- (6) Signal word

**5.2.1.3.3** Given a label for a radioactive material, the operations level responder shall identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable.

**5.2.1.4\*** The operations level responder shall identify and list the surrounding conditions that should be noted when a hazardous materials/WMD incident is surveyed.

**5.2.1.5** The operations level responder shall describe ways to verify information obtained from the survey of a hazardous materials/WMD incident.

**5.2.1.6\*** The operations level responder shall identify at least three additional hazards that could be associated with an incident involving terrorist or criminal activities.

**5.2.2 Collecting Hazard and Response Information.** Given scenarios involving known hazardous materials/WMD, the operations level responder shall collect hazard and response information using MSDS, HEMTREC/CANUTEC/SETIQ, governmental authorities, and shippers and manufacturers by completing the following requirements:

(1) Match the definitions associated with the UN/DOT hazard classes and divisions of hazardous materials/WMD, including refrigerated liquefied gases and cryogenic liquids, with the class or division (2) Identify two ways to obtain an MSDS in an emergency

(3) Using an MSDS for a specified material, identify the following hazard and response information:

- (a) Physical and chemical characteristics
- (b) Physical hazards of the material
- (c) Health hazards of the material
- (d) Signs and symptoms of exposure
- (e) Routes of entry
- (f) Permissible exposure limits
- (g) Responsible party contact
- (h) Precautions for safe handling (including hygiene practices, protective measures, and procedures for cleanup of spills and leaks)
- (i) Applicable control measures, including personal protective equipment
- (j) Emergency and first-aid procedures

(4) Identify the following:

- (a) Type of assistance provided by CHEMTREC/CANUTEC/SETIQ and governmental authorities
- (b) Procedure for contacting CHEMTREC/CANUTEC/SETIQ and governmental authorities
- (c) Information to be furnished to CHEMTREC/CANUTEC/SETIQ and governmental authorities

(5) Identify two methods of contacting the manufacturer or shipper to obtain hazard and response information

(6) Identify the type of assistance provided by governmental authorities with respect to criminal or terrorist activities involving the release or potential release of hazardous materials/WMD

(7) Identify the procedure for contacting local, state, and federal authorities as specified in the emergency response plan and/or standard operating procedures

(8)\*Describe the properties and characteristics of the following:

- (a) Alpha radiation
- (b) Beta radiation
- (c) Gamma radiation
- (d) Neutron radiation

**5.2.3\* Predicting the Likely Behavior of a Material and Its Container.** Given scenarios involving hazardous materials/WMD incidents, each with a single hazardous material/WMD, the operations level responder shall describe the likely behavior of the material or agent and its container by completing the following requirements:

(1) Use the hazard and response information obtained from the current edition of the DOT *Emergency Response Guidebook*, MSDS, CHEMTREC/CANUTEC/SETIQ, governmental authorities, and shipper and manufacturer contacts, as follows:

(a) Match the following chemical and physical properties with their significance and impact on the behavior of the container and its contents:

- i. Boiling point
- ii. Chemical reactivity
- iii. Corrosivity (pH)
- iv. Flammable (explosive) range [lower explosive limit (LEL) and upper explosive limit (UEL)]
- v. Flash point
- vi. Ignition (auto-ignition) temperature
- vii. Particle size
- viii. Persistence
- ix. Physical state (solid, liquid, gas)
- x. Radiation (ionizing and non-ionizing)
- xi. Specific gravity
- xii. Toxic products of combustion
- xiii. Vapor density
- xiv. Vapor pressure
- xv. Water solubility

(b) Identify the differences between the following terms:

- i. *Contamination* and *secondary contamination*
- ii. *Exposure* and *contamination*
- iii. *Exposure* and *hazard*
- iv. *Infectious* and *contagious*
- v. *Acute effects* and *chronic effects*
- vi. *Acute exposures* and *chronic exposures*

(2)\*Identify three types of stress that can cause a container system to release its contents

(3)\*Identify five ways in which containers can breach

(4)\*Identify four ways in which containers can release their contents

(5)\*Identify at least four dispersion patterns that can be created upon release of a hazardous material

(6)\*Identify the time frames for estimating the duration that hazardous materials/WMD will present an exposure risk

(7)\*Identify the health and physical hazards that could cause harm

(8)\*Identify the health hazards associated with the following terms:

- (a) Alpha, beta, gamma, and neutron radiation
- (b) Asphyxiant
- (c)\*Carcinogen
- (d) Convulsant
- (e) Corrosive
- (f) Highly toxic
- (g) Irritant
- (h) Sensitizer, allergen
- (i) Target organ effects
- (j) Toxic

(9)\*Given the following, identify the corresponding UN/DOT hazard class and division:

- (a) Blood agents
- (b) Biological agents and biological toxins
- (c) Choking agents
- (d) Irritants (riot control agents)
- (e) Nerve agents
- (f) Radiological materials
- (g) Vesicants (blister agents)

**5.2.4\* Estimating Potential Harm.** Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall describe the potential harm within the endangered area at each incident by completing the following requirements:

- (1)\*Identify a resource for determining the size of an endangered area of a hazardous materials/WMD incident
- (2) Given the dimensions of the endangered area and the surrounding conditions at a hazardous materials/WMD incident, describe the number and type of exposures within that endangered area
- (3) Identify resources available for determining the concentrations of a released hazardous materials/WMD within an endangered area
- (4)\*Given the concentrations of the released material, describe the factors for determining the extent of physical, health, and safety hazards within the endangered area of a hazardous materials/WMD incident
- (5) Describe the impact that time, distance, and shielding have on exposure to radioactive materials specific to the expected dose rate

### **5.3 Core Competencies — Planning the Response.**

**5.3.1 Describing Response Objectives.** Given at least two scenarios involving hazardous materials/WMD incidents, the operations level responder shall describe the response objectives for each example by completing the following requirements:

- (1) Given an analysis of a hazardous materials/WMD incident and the exposures, describe the number of exposures that could be saved with the resources provided by the AHJ
- (2) Given an analysis of a hazardous materials/WMD incident, describe the steps for determining response objectives
- (3) Describe how to assess the risk to a responder for each hazard class in rescuing injured persons at a hazardous materials/WMD incident
- (4)\*Describe the potential for secondary attacks and devices at criminal or terrorist events

**5.3.2 Identifying Action Options.** Given examples of hazardous materials/WMD incidents (facility and transportation), the operations level responder shall identify the options for each response objective and shall meet the following requirements:

- (1) Identify the options to accomplish a given response objective
- (2) Describe the prioritization of emergency medical care and removal of victims from the hazard area relative to exposure and contamination concerns

**5.3.3 Determining Suitability of Personal Protective Equipment.** Given examples of hazardous materials/WMD incidents, including the names of the hazardous materials/WMD involved and the anticipated type of exposure, the operations level responder shall determine whether available personal protective equipment is applicable to performing assigned tasks by completing the following requirements:

- (1)\*Identify the respiratory protection required for a given response option and the following:
  - (a) Describe the advantages, limitations, uses, and operational components of the following types of respiratory protection at hazardous materials/WMD incidents:
    - i. Positive pressure self-contained breathing apparatus (SCBA)
    - ii. Positive pressure air-line respirator with required escape unit
    - iii. Closed-circuit SCBA
    - iv. Powered air-purifying respirator (PAPR)
    - v. Air-purifying respirator (APR)
    - vi. Particulate respirator
  - (b) Identify the required physical capabilities and limitations of personnel working in respiratory protection
- (2) Identify the personal protective clothing required for a given option and the following:
  - (a) Identify skin contact hazards encountered at hazardous materials/WMD incidents
  - (b) Identify the purpose, advantages, and limitations of the following types of protective clothing at hazardous materials/WMD incidents:
    - i. Chemical-protective clothing such as liquid splash-protective clothing and vapor-protective clothing
    - ii. High temperature-protective clothing such as proximity suit and entry suits
    - iii. Structural fire-fighting protective clothing

**5.3.4\* Identifying Decontamination Issues.** Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall identify when decontamination is needed by completing the following requirements:

- (1) Identify ways that people, personal protective equipment, apparatus, tools, and equipment become contaminated
- (2) Describe how the potential for secondary contamination determines the need for decontamination
- (3) Explain the importance and limitations of decontamination procedures at hazardous materials incidents
- (4) Identify the purpose of emergency decontamination procedures at hazardous materials incidents
- (5) Identify the methods, advantages, and limitations of emergency decontamination procedures

### **5.4 Core Competencies — Implementing the Planned Response.**

**5.4.1 Establishing Scene Control.** Given two scenarios involving hazardous materials/WMD incidents, the operations level responder shall explain how to establish and maintain scene control, including control zones and emergency contamination, and communications between responders and to the public by completing 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) Shelter-in-place
- (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 material incidents
  - (b)\*Hazardous materials/WMD incidents involving criminal activities
- (6) Identify the procedures for ensuring coordinated communication between responders and to the public

**5.4.2\* Preserving Evidence.** Given two scenarios involving hazardous materials/WMD incidents, the operations level responder shall describe the process to preserve evidence as listed in the emergency response plan and/or standard operating procedures.

**5.4.3\* Initiating the Incident Command System.** Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall implement the incident command system as required by the AHJ by completing the following requirements:

- (1) Identify the role of the operations level responder during hazardous materials/WMD incidents as specified in the emergency response plan and/or standard operating procedures
- (2) Identify the levels of hazardous materials/WMD incidents as defined in the emergency response plan
- (3) Identify the purpose, need, benefits, and elements of the incident command system for hazardous materials/WMD incidents
- (4) Identify the duties and responsibilities of the following functions within the incident management system:
  - (a) Incident safety officer
  - (b) Hazardous materials branch or group
- (5) Identify the considerations for determining the location of the incident command post for a hazardous materials/WMD incident
- (6) Identify the procedures for requesting additional resources at a hazardous materials/WMD incident
- (7) Describe the role and response objectives of other agencies that respond to hazardous materials/WMD incidents

**5.4.4 Using Personal Protective Equipment.** Given the personal protective equipment provided by the AHJ, the operations level responder shall describe considerations for the use of personal protective equipment provided by the AHJ by completing the following requirements:

- (1) Identify the importance of the buddy system
- (2) Identify the importance of the backup personnel
- (3) Identify the safety precautions to be observed when approaching and working at hazardous materials/WMD incidents
- (4) Identify the signs and symptoms of heat and cold stress and procedures for their control
- (5) Identify the capabilities and limitations of personnel working in the personal protective equipment provided by the AHJ
- (6) Identify the procedures for cleaning, disinfecting, and inspecting personal protective equipment provided by the AHJ
- (7) Describe the maintenance, testing, inspection, and storage procedures for personal protective equipment provided by the AHJ according to the manufacturer's specifications and recommendations

## **5.5 Core Competencies — Evaluating Progress.**

**5.5.1 Evaluating the Status of Planned Response.** Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan, the operations level responder shall determine the effectiveness of the actions taken in accomplishing the response objectives and shall meet the following requirements:

- (1) Identify the considerations for evaluating whether actions taken were effective in accomplishing the objectives
- (2) Describe the circumstances under which it would be prudent to withdraw from a hazardous materials/WMD incident

**5.5.2 Communicating the Status of Planned Response.** Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan, the operations level responder shall report the status of the planned response through the normal chain of command by completing the following requirements:

- (1) Identify the procedures for reporting the status of the planned response through the normal chain of command
- (2) Identify the methods for immediate notification of the incident commander and other response personnel about critical emergency conditions at the incident.

## **5.6\* Competencies — Terminating the Incident. (Reserved)**

# **Chapter 6 Competencies for Operations Level Responders Assigned Mission-Specific Responsibilities**

## **6.1 General.**

### **6.1.1 Introduction.**



**6.1.1.1\*** This chapter shall address competencies for the following operations level responders assigned mission-specific responsibilities at hazardous materials/WMD incidents by the AHJ beyond the core competencies at the operations level (*see Chapter 5*):

- (1) Operations level responders assigned to use personal protective equipment (*see Section 6.2*)
- (2) Operations level responders assigned to perform mass decontamination (*see Section 6.3*)
- (3) Operations level responders assigned to perform technical decontamination (*see Section 6.4*)
- (4) Operations level responders assigned to perform evidence preservation and sampling (*see Section 6.5*)
- (5) Operations level responders assigned to perform product control (*see Section 6.6*)
- (6) Operations level responders assigned to perform air monitoring and sampling (*see Section 6.7*)
- (7) Operations level responders assigned to perform victim rescue/recovery (*see Section 6.8*)
- (8) Operations level responders assigned to respond to illicit laboratory incidents (*see Section 6.9*)
- (9) Operational level responders assigned to perform disablement/disruption of improvised explosives devices (IED), improvised WMD dispersal devices, and operations at improvised explosive laboratories. (*see Section 6.10*)

**6.1.1.2** The operations level responder who is assigned mission specific responsibilities at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), and all competencies for the assigned responsibilities in the applicable section(s) in this chapter.

**6.1.1.3\*** The operations level responder who is assigned mission specific responsibilities at hazardous materials/WMD incidents shall receive additional training to meet applicable governmental occupational health and safety regulations.

**6.1.1.4** The operations level responder who is assigned mission specific responsibilities at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, an emergency response plan, or standard operating procedures.

**6.1.1.5** The development of assigned mission-specific knowledge and skills shall be based on the tools, equipment, and procedures provided by the AHJ for the mission-specific responsibilities assigned.

**6.1.2 Goal.** The goal of the competencies in this chapter shall be to provide the operations level responder assigned mission specific responsibilities at hazardous materials/WMD incidents by the AHJ with the knowledge and skills to perform the assigned mission specific responsibilities safely and effectively.

**6.1.3 Mandating of Competencies.** This standard shall not mandate that the response organizations perform mission specific responsibilities.

**6.1.3.1** Operations level responders assigned mission-specific responsibilities at hazardous materials/WMD incidents, operating within the scope of their training in this chapter, shall be able to perform their assigned mission-specific responsibilities.

**6.1.3.2** If a response organization desires to train some or all of its operations level responders to perform mission specific responsibilities at hazardous materials/WMD incidents, the minimum required competencies shall be as set out in this chapter.

## **6.2 Mission-Specific Competencies: Personal Protective Equipment.**

### **6.2.1 General.**

#### **6.2.1.1 Introduction.**

**6.2.1.1.1** The operations level responder assigned to use personal protective equipment shall be that person, competent at the operations level, who is assigned to use personal protective equipment at hazardous materials/WMD incidents.

**6.2.1.1.2** The operations level responder assigned to use personal protective equipment at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), and all competencies in this section.

**6.2.1.1.3** The operations level responder assigned to use personal protective equipment at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.2.1.1.4\*** The operations level responder assigned to use personal protective equipment shall receive the additional training necessary to meet specific needs of the jurisdiction.

**6.2.1.2 Goal.** The goal of the competencies in this section shall be to provide the operations level responder assigned to use personal protective equipment with the knowledge and skills to perform the following tasks safely and effectively:

- (1) Plan a response within the capabilities of personal protective equipment provided by the AHJ in order to perform Mission specific tasks assigned
- (2) Implement the planned response consistent with the standard operating procedures and site safety and control plan by donning, working in, and doffing personal protective equipment provided by the AHJ
- (3) Terminate the incident by completing the reports and documentation pertaining to personal protective equipment

#### **6.2.2 Competencies — Analyzing the Incident. (Reserved)**

#### **6.2.3 Competencies — Planning the Response.**

**6.2.3.1 Selecting Personal Protective Equipment.** Given scenarios involving hazardous materials/WMD incidents with known and unknown hazardous materials/WMD and the personal protective equipment provided by the AHJ, the operations level responder assigned to use personal protective equipment shall select the personal protective equipment required to support mission-specific tasks at hazardous materials/WMD incidents based on local procedures by completing the following requirements:

- (1)\*Describe the types of personal protective equipment that are available for response based on NFPA standards and how these items relate to EPA levels of protection
- (2) Describe personal protective equipment options for the following hazards:
  - (a) Thermal
  - (b) Radiological
  - (c) Asphyxiating
  - (d) Chemical
  - (e) Etiological/biological
  - (f) Mechanical
- (3) Select personal protective equipment for mission specific tasks at hazardous materials/WMD incidents based on local procedures
  - (a) Describe the following terms and explain their impact and significance on the selection of chemical protective clothing:
    - i. Degradation
    - ii. Penetration
    - iii. Permeation
  - (b) Identify at least three indications of material degradation of chemical-protective clothing
  - (c) Identify the different designs of vapor-protective and splash-protective clothing and describe the advantages and disadvantages of each type
  - (d)\*Identify the relative advantages and disadvantages of the following heat exchange units used for the cooling of personnel operating in personal protective equipment:
    - i. Air cooled
    - ii. Ice cooled
    - iii. Water cooled
    - iv. Phase change cooling technology
  - (e) Identify the physiological and psychological stresses that can affect users of personal protective equipment
  - (f) Describe local procedures for going through the technical decontamination process

#### **6.2.4 Competencies — Implementing the Planned Response.**

**6.2.4.1 Using Protective Clothing and Respiratory Protection.** Given the personal protective equipment provided by the AHJ, the operations level responder assigned to use personal protective equipment shall demonstrate the ability to don, work in, and doff the equipment provided to support mission specific tasks by completing the following requirements:

- (1) Describe at least three safety procedures for personnel wearing protective clothing
- (2) Describe at least three emergency procedures for personnel wearing protective clothing
- (3) Demonstrate the ability to don, work in, and doff personal protective equipment provided by the AHJ
- (4) Demonstrate local procedures for responders undergoing the technical decontamination process
- (5) Describe the maintenance, testing, inspection, storage, and documentation procedures for personal protective equipment provided by the AHJ according to the manufacturer's specifications and recommendations

#### **6.2.5 Competencies — Terminating the Incident.**

**6.2.5.1 Reporting and Documenting the Incident.** Given a scenario involving a hazardous materials/WMD incident, the operations level responder assigned to use personal protective equipment shall document use of the personal protective equipment by completing the documentation requirements of the emergency response plan or standard operating procedures regarding personal protective equipment.

### **6.3 Mission-Specific Competencies: Mass Decontamination.**

#### **6.3.1 General.**

##### **6.3.1.1 Introduction.**

**6.3.1.1.1** The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall be that person, competent at the operations level, who is assigned to implement mass decontamination operations at hazardous materials/WMD incidents.

**6.3.1.1.2** The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), and all competencies in this section.

**6.3.1.1.3** The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.3.1.1.4\*** The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

##### **6.3.1.2 Goal.**

**6.3.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.3.1.2.2 safely and effectively.

**6.3.1.2.2** When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform mass decontamination shall be able to perform the following tasks:

- (1) Plan a response within the capabilities of available personnel, personal protective equipment, and control equipment by selecting a mass decontamination process to minimize the hazard
- (2) Implement the planned response to favorably change the outcomes consistent with standard operating procedures and the site safety and control plan by completing the following tasks:
  - (a) Perform the decontamination duties as assigned
  - (b) Perform the mass decontamination functions identified in the incident action plan
- (3) Evaluate the progress of the planned response by evaluating the effectiveness of the mass decontamination process
- (4) Terminate the incident by providing reports and documentation of decontamination operations

### **6.3.2 Competencies — Analyzing the Incident. (Reserved)**

#### **6.3.3 Competencies — Planning the Response.**

**6.3.3.1 Selecting Personal Protective Equipment.** Given an emergency response plan or standard operating procedures and the personal protective equipment provided by the AHJ, the operations level responder assigned to mass decontamination shall select the personal protective equipment required to support mass decontamination at hazardous materials/WMD incidents based on local procedures (*see Section 6.2*).

**6.3.3.2 Selecting Decontamination Procedures.** Given scenarios involving hazardous materials/WMD incidents, the operations level responder assigned to mass decontamination operations shall select a mass decontamination procedure that will minimize the hazard and spread of contamination, determine the equipment required to implement that procedure, and meet the following requirements:

- (1) Identify the advantages and limitations of mass decontamination operations
- (2) Describe the advantages and limitations of each of the following mass decontamination methods:
  - (a) Dilution
  - (b) Isolation
  - (c) Washing
- (3) Identify sources of information for determining the correct mass decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident
- (4) Given resources provided by the AHJ, identify the supplies and equipment required to set up and implement mass decontamination operations
- (5) Identify procedures, equipment, and safety precautions for communicating with crowds and crowd management techniques that can be used at incidents where a large number of people might be contaminated

#### **6.3.4 Competencies — Implementing the Planned Response.**

**6.3.4.1 Performing Incident Management Duties.** Given a scenario involving a hazardous materials/WMD incident and the emergency response plan or standard operating procedures, the operations level responder assigned to mass decontamination operations shall demonstrate the mass decontamination duties assigned in the incident action plan by describing the local procedures for the implementation of the mass decontamination function within the incident command system.

**6.3.4.2 Performing Decontamination Operations Identified in Incident Action Plan.** The operations level responder assigned to mass decontamination operations shall demonstrate the ability to set up and implement mass decontamination operations for ambulatory and non-ambulatory victims.

#### **6.3.5 Competencies — Evaluating Progress.**

**6.3.5.1 Evaluating the Effectiveness of the Mass Decontamination Process.** Given examples of contaminated items that have undergone the required decontamination, the operations level responder assigned to mass decontamination operations shall identify procedures for determining whether the items have been fully decontaminated according to the standard operating procedures of the AHJ or the incident action plan.

#### **6.3.6 Competencies — Terminating the Incident.**

**6.3.6.1 Reporting and Documenting the Incident.** Given a scenario involving a hazardous materials/WMD incident, the operations level responder assigned to mass decontamination operations shall document the mass decontamination activities as required by the AHJ by completing the following:

- (1) Identify the reports and supporting documentation required by the emergency response plan or standard operating procedures
- (2) Describe the importance of personnel exposure records
- (3) Identify the steps in keeping an activity log and exposure records
- (4) Identify the requirements for filing documents and maintaining records

### **6.4 Mission-Specific Competencies: Technical Decontamination.**

#### **6.4.1 General.**

##### **6.4.1.1 Introduction.**

**6.4.1.1.1** The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall be that person, competent at the operations level, who is assigned to implement technical decontamination operations at hazardous materials/WMD incidents.

**6.4.1.1.2** The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), and all competencies in this section.

**6.4.1.1.3** The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.4.1.1.4\*** The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

**6.4.1.2 Goal.**

**6.4.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.4.1.2.2 safely and effectively.

**6.4.1.2.2** When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform technical decontamination shall be able to perform the following tasks:

- (1) Plan a response within the capabilities of available personnel, personal protective equipment, and control equipment by selecting a technical decontamination process to minimize the hazard
- (2) Implement the planned response to favorably change the outcomes consistent with standard operating procedures and the site safety and control plan by completing the following tasks:
  - (a) Perform the technical decontamination duties as assigned
  - (b) Perform the technical decontamination functions identified in the incident action plan
- (3) Evaluate the progress of the planned response by evaluating the effectiveness of the technical decontamination process
- (4) Terminate the incident by completing the reports and documentation of decontamination operations

**6.4.2 Competencies — Analyzing the Incident. (Reserved)**

**6.4.3 Competencies — Planning the Response.**

**6.4.3.1 Selecting Personal Protective Equipment.** Given an emergency response plan or standard operating procedures and the personal protective equipment provided by the AHJ, the operations level responder assigned to technical decontamination operations shall select the personal protective equipment required to support technical decontamination at hazardous materials/WMD incidents based on local procedures (*see Section 6.2*).

**6.4.3.2 Selecting Decontamination Procedures.** Given scenarios involving hazardous materials/WMD incidents, the operations level responder assigned to technical decontamination operations shall select a technical decontamination procedure that will minimize the hazard and spread of contamination and determine the equipment required to implement that procedure by completing the following requirements:

- (1) Identify the advantages and limitations of technical decontamination operations
- (2) Describe the advantages and limitations of each of the following technical decontamination methods:
  - (a) Absorption
  - (b) Adsorption
  - (c) Chemical degradation
  - (d) Dilution
  - (e) Disinfection
  - (f) Evaporation
  - (g) Isolation and disposal
  - (h) Neutralization
  - (i) Solidification
  - (j) Sterilization
  - (k) Vacuuming
  - (l) Washing
- (3) Identify sources of information for determining the correct technical decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident
- (4) Given resources provided by the AHJ, identify the supplies and equipment required to set up and implement technical decontamination operations
- (5) Identify the procedures, equipment, and safety precautions for processing evidence during technical decontamination operations at hazardous materials/WMD incidents
- (6) Identify procedures, equipment, and safety precautions for handling tools, equipment, weapons, criminal suspects, and law enforcement/search canines brought to the decontamination corridor at hazardous materials/WMD incidents

**6.4.4 Competencies — Implementing the Planned Response.**

**6.4.4.1 Performing Incident Management Duties.** Given a scenario involving a hazardous materials/WMD incident and the emergency response plan or standard operating procedures, the operations level responder assigned to technical

decontamination operations shall demonstrate the technical decontamination duties assigned in the incident action plan by completing the following requirements:

- (1) Identify the role of the operations level responder assigned to technical decontamination operations during hazardous materials/WMD incidents
- (2) Describe the procedures for implementing technical decontamination operations within the incident command system

**6.4.4.2 Performing Decontamination Operations Identified in Incident Action Plan.** The responder assigned to technical decontamination operations shall demonstrate the ability to set up and implement the following types of decontamination operations:

- (1) Technical decontamination operations in support of entry operations
- (2) Technical decontamination operations for ambulatory and non-ambulatory victims

**6.4.5 Competencies — Evaluating Progress.**

**6.4.5.1 Evaluating the Effectiveness of the Technical Decontamination Process.** Given examples of contaminated items that have undergone the required decontamination, the operations level responder assigned to technical decontamination operations shall identify procedures for determining whether the items have been fully decontaminated according to the standard operating procedures of the AHJ or the incident action plan.

**6.4.6 Competencies — Terminating the Incident.**

**6.4.6.1 Reporting and Documenting the Incident.** Given a scenario involving a hazardous materials/WMD incident, the operations level responder assigned to technical decontamination operations shall document the mass decontamination activities as required by the AHJ by completing the following:

- (1) Identify the reports and supporting technical documentation required by the emergency response plan or standard operating procedures
- (2) Describe the importance of personnel exposure records
- (3) Identify the steps in keeping an activity log and exposure records
- (4) Identify the requirements for filing documents and maintaining records

**6.5 Mission-Specific Competencies: Evidence Preservation and Sampling.**

**6.5.1 General.**

**6.5.1.1 Introduction.**

**6.5.1.1.1** The operations level responder assigned to perform evidence preservation and sampling shall be that person, competent at the operations level, who is assigned to preserve forensic evidence, take samples, and/or seize evidence at hazardous materials/WMD incidents involving potential violations of criminal statutes or governmental regulations.

**6.5.1.1.2** The operations level responder assigned to perform evidence preservation and sampling at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), and all competencies in this section.

**6.5.1.1.3** The operations level responder assigned to perform evidence preservation and sampling at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.5.1.1.4\*** The operations level responder assigned to perform evidence preservation and sampling at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

**6.5.1.2 Goal.**

**6.5.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned to evidence preservation and sampling at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.5.1.2.2 safely and effectively.

**6.5.1.2.2** When responding to hazardous materials/WMD incidents involving potential violations of criminal statutes or governmental regulations, the operations level responder assigned to perform evidence preservation and sampling shall be able to perform the following tasks:

- (1) Analyze a hazardous materials/WMD incident to determine the complexity of the problem and potential outcomes by completing the following tasks:
  - (a) Determine if the incident is potentially criminal in nature and identify the law enforcement agency having investigative jurisdiction
  - (b) Identify unique aspects of criminal hazardous materials/WMD incidents
- (2) Plan a response for an incident where there is potential criminal intent involving hazardous materials/WMD within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:
  - (a) Determine the response options to conduct sampling and evidence preservation operations
  - (b) Describe how the options are within the legal authorities, capabilities, and competencies of available personnel, personal protective equipment, and control equipment
- (3) Implement the planned response to a hazardous materials/WMD incident involving potential violations of criminal statutes or governmental regulations by completing the following tasks under the guidance of law enforcement:
  - (a) Preserve forensic evidence
  - (b) Take samples

- (c) Seize evidence

### **6.5.2 Competencies —Analyzing the Incident.**

**6.5.2.1 Determining If the Incident Is Potentially Criminal in Nature and Identifying the Law Enforcement Agency That Has Investigative Jurisdiction.** Given examples of hazardous materials/WMD incidents involving potential criminal intent, the operations level responder assigned to evidence preservation and sampling shall describe the potential criminal violation and identify the law enforcement agency having investigative jurisdiction by completing the following requirements:

(1) Given examples of the following hazardous materials/WMD incidents, the operations level responder shall describe products that might be encountered in the incident associated with each situation:

- (a) Hazardous materials/WMD suspicious letter
- (b) Hazardous materials/WMD suspicious package
- (c) Hazardous materials/WMD illicit laboratory
- (d) Release/attack with a WMD agent
- (e) Environmental crimes

(2) Given examples of the following hazardous materials/WMD incidents, the operations level responder shall identify the agency(cies) with investigative authority and the incident response considerations associated with each situation:

- (a) Hazardous materials/WMD suspicious letter
- (b) Hazardous materials/WMD suspicious package
- (c) Hazardous materials/WMD illicit laboratory
- (d) Release/attack with a WMD agent
- (e) Environmental crimes

### **6.5.3 Competencies — Planning the Response.**

**6.5.3.1 Identifying Unique Aspects of Criminal Hazardous Materials/WMD Incidents.** The operations level responder assigned to evidence preservation and sampling shall describe the unique aspects associated with illicit laboratories, hazardous materials/WMD incidents, and environmental crimes by completing the following requirements:

(1) Given an incident involving illicit laboratories, a hazardous materials/WMD incident, or an environmental crime, the operations level responder shall perform the following tasks:

- (a) Describe the procedure for securing the scene and characterizing and preserving evidence at the scene
- (b) Describe the procedure to document personnel and scene activities associated with the incident
- (c) Describe the procedure to determine whether the operations level responders are within their legal authority to perform evidence preservation and sampling tasks
- (d) Describe the procedure to notify the agency with investigative authority
- (e) Describe the procedure to notify the explosive ordnance disposal (EOD) personnel
- (f) Identify potential sample/evidence
- (g) Identify the applicable sampling equipment
- (h) Describe the procedures to protect samples and evidence from secondary contamination
- (i) Describe documentation procedures
- (j) Describe evidentiary sampling techniques
- (k) Describe field screening protocols for collected samples and evidence
- (l) Describe evidence labeling and packaging procedures
- (m) Describe evidence decontamination procedures
- (n) Describe evidence packaging procedures for evidence transportation
- (o) Describe chain-of-custody procedures

(2) Given an example of an illicit laboratory, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:

- (a) Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
- (b) Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
- (c) Describe the sampling options associated with liquid and solid sample and evidence collection
- (d) Describe the field screening protocols for collected samples and evidence

(3) Given an example of an environmental crime, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:

- (a) Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
- (b) Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
- (c) Describe the sampling options associated with the collection of liquid and solid samples and evidence
- (d) Describe the field screening protocols for collected samples and evidence

(4) Given an example of a hazardous materials/WMD suspicious letter, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:

- (a) Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident

- (b) Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
  - (c) Describe the sampling options associated with the collection of liquid and solid samples and evidence
  - (d) Describe the field screening protocols for collected samples and evidence
- (5) Given an example of a hazardous materials/WMD suspicious package, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:
- (a) Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
  - (b) Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
  - (c) Describe the sampling options associated with liquid and solid sample/evidence collection
  - (d) Describe the field screening protocols for collected samples and evidence
- (6) Given an example of a release/attack involving a hazardous materials/WMD agent, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:
- (a) Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
  - (b) Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
  - (c) Describe the sampling options associated with the collection of liquid and solid samples and evidence
  - (d) Describe the field screening protocols for collected samples and evidence
- (7) Given examples of different types of potential criminal hazardous materials/WMD incidents, the operations level responder shall identify and describe the application, use, and limitations of the various types field screening tools that can be utilized for screening the following:
- (a) Corrosivity
  - (b) Flammability
  - (c) Oxidation
  - (d) Radioactivity
  - (e) Volatile organic compounds (VOC)

(8) Describe the potential adverse impact of using destructive field screening techniques

(9) Describe the procedures for maintaining the evidentiary integrity of any item removed from the crime scene

**6.5.3.2 Selecting Personal Protective Equipment.** Given the personal protective equipment provided by the AHJ, the operations level responder assigned to evidence preservation and sampling shall select the personal protective equipment required to support evidence preservation and sampling at hazardous materials/WMD incidents based on local procedures (*see Section 6.2*).

#### **6.5.4 Competencies — Implementing the Planned Response.**

**6.5.4.1 Implementing the Planned Response.** Given the incident action plan for a criminal incident involving hazardous materials/WMD, the operations level responder assigned to evidence preservation and sampling shall implement selected response actions consistent with the emergency response plan or standard operating procedures by completing the following requirements:

- (1) Demonstrate how to secure the scene and characterize and preserve evidence at the scene
- (2) Document personnel and scene activities associated with the incident
- (3) Determine whether responders are within their legal authority to perform evidence collection and sampling tasks
- (4) Describe the procedure to notify the agency with investigative authority
- (5) Notify the EOD personnel
- (6) Identify potential samples and evidence to be collected
- (7) Demonstrate procedures to protect samples and evidence from secondary contamination
- (8) Demonstrate correct techniques to collect samples utilizing the equipment provided
- (9) Demonstrate documentation procedures
- (10) Demonstrate sampling protocols
- (11) Demonstrate field screening protocols for samples and evidence collected
- (12) Demonstrate evidence/sample labeling and packaging procedures
- (13) Demonstrate evidence/sample decontamination procedures
- (14) Demonstrate evidence/sample packaging procedures for evidence transportation
- (15) Describe chain of custody procedures for evidence/sample preservation

**6.5.4.2** The operations level responder assigned to evidence preservation and sampling shall describe local procedures for the technical decontamination process.

#### **6.5.5 Competencies — Implementing the Planned Response. (Reserved)**

#### **6.5.6 Competencies — Terminating the Incident. (Reserved)**

### **6.6 Mission-Specific Competencies: Product Control.**

#### **6.6.1 General.**

##### **6.6.1.1 Introduction.**

**6.6.1.1.1** The operations level responder assigned to perform product control shall be that person, competent at the operations level, who is assigned to implement product control measures at hazardous materials/WMD incidents.

**6.6.1.1.2** The operations level responder assigned to perform product control at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), and all competencies in this section.

**6.6.1.1.3** The operations level responder assigned to perform product control at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.6.1.1.4\*** The operations level responder assigned to perform product control at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

**6.6.1.2 Goal.**

**6.6.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned to product control at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.6.1.2.2 safely and effectively.

**6.6.1.2.2** When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform product control shall be able to perform the following tasks:

(1) Plan an initial response within the capabilities and competencies of available personnel, personal protective equipment, and control equipment and in accordance with the emergency response plan or standard operating procedures by completing the following tasks:

- (a) Describe the control options available to the operations level responder
- (b) Describe the control options available for flammable liquid and flammable gas incidents

(2) Implement the planned response to a hazardous materials/WMD incident

**6.6.2 Competencies — Analyzing the Incident. (Reserved)**

**6.6.3 Competencies — Planning the Response.**

**6.6.3.1 Identifying Control Options.** Given examples of hazardous materials/WMD incidents, the operations level responder assigned to perform product control shall identify the options for each response objective by completing the following requirements as prescribed by the AHJ:

(1) Identify the options to accomplish a given response objective

(2) Identify the purpose for and the procedures, equipment, and safety precautions associated with each of the following control techniques:

- (a) Absorption
- (b) Adsorption
- (c) Damming
- (d) Diking
- (e) Dilution
- (f) Diversion
- (g) Remote valve shutoff
- (h) Retention
- (i) Vapor dispersion
- (j) Vapor suppression

**6.6.3.2 Selecting Personal Protective Equipment.** Given the personal protective equipment provided by the AHJ, the operations level responder assigned to perform product control shall select the personal protective equipment required to support product control at hazardous materials/WMD incidents based on local procedures (*see Section 6.2*).

**6.6.4 Competencies — Implementing the Planned Response.**

**6.6.4.1 Performing Control Options.** Given an incident action plan for a hazardous materials/WMD incident, within the capabilities and equipment provided by the AHJ, the operations level responder assigned to perform product control shall demonstrate control functions set out in the plan by completing the following requirements as prescribed by the AHJ:

(1) Using the type of special purpose or hazard suppressing foams or agents and foam equipment furnished by the AHJ, demonstrate the application of the foam(s) or agent(s) on a spill or fire involving hazardous materials/WMD

(2) Identify the characteristics and applicability of the following Class B foams if supplied by the AHJ:

- (a) Aqueous film-forming foam (AFFF)
- (b) Alcohol-resistant concentrates
- (c) Fluoroprotein
- (d) High-expansion foam

(3) Given the required tools and equipment, demonstrate how to perform the following control activities:

- (a) Absorption
- (b) Adsorption
- (c) Damming
- (d) Diking
- (e) Dilution
- (f) Diversion
- (g) Retention



- (h) Remote valve shutoff
- (i) Vapor dispersion
- (j) Vapor suppression

(4) Identify the location and describe the use of emergency remote shutoff devices on MC/DOT-306/406, MC/DOT-307/407, and MC-331 cargo tanks containing flammable liquids or gases

(5) Describe the use of emergency remote shutoff devices at fixed facilities

**6.6.4.2** The operations level responder assigned to perform product control shall describe local procedures for going through the technical decontamination process.

**6.6.5 Competencies — Evaluating Progress. (Reserved)**

**6.6.6 Competencies — Terminating the Incident. (Reserved)**

**6.7 Mission-Specific Competencies: Air Monitoring and Sampling.**

**6.7.1 General.**

**6.7.1.1 Introduction.**

**6.7.1.1.1** The operations level responder assigned to perform air monitoring and sampling shall be that person, competent at the operations level, who is assigned to implement air monitoring and sampling operations at hazardous materials/WMD incidents.

**6.7.1.1.2** The operations level responder assigned to perform air monitoring and sampling at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), and all competencies in this section.

**6.7.1.1.3** The operations level responder assigned to perform air monitoring and sampling at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.7.1.1.4\*** The operations level responder assigned to perform air monitoring and sampling at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

**6.7.1.2 Goal.**

**6.7.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned to air monitoring and sampling at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.7.1.2.2 safely and effectively.

**6.7.1.2.2** When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform air monitoring and sampling shall be able to perform the following tasks:

- (1) Plan the air monitoring and sampling activities within the capabilities and competencies of available personnel, personal protective equipment, and control equipment and in accordance with the emergency response plan or standard operating procedures describe the air monitoring and sampling options available to the operations level responder
- (2) Implement the air monitoring and sampling activities as specified in the incident action plan

**6.7.2 Competencies — Analyzing the Incident. (Reserved)**

**6.7.3 Competencies — Planning the Response.**

**6.7.3.1** Given the air monitoring and sampling equipment provided by the AHJ, the operations level responder assigned to perform air monitoring and sampling shall select the detection or monitoring equipment suitable for detecting or monitoring solid, liquid, or gaseous hazardous materials/WMD.

**6.7.3.2** Given detection and monitoring device(s) provided by the AHJ, the operations level responder assigned to perform air monitoring and sampling shall describe the operation, capabilities and limitations, local monitoring procedures, field testing, and maintenance procedures associated with each device.

**6.7.3.3 Selecting Personal Protective Equipment (PPE).** Given the PPE provided by the AHJ, the operations level responder assigned to perform air monitoring and sampling shall select the personal protective equipment required to support air monitoring and sampling at hazardous materials/WMD incidents based on local procedures (*see Section 6.2*).

**6.7.4 Competencies — Implementing the Planned Response.**

**6.7.4.1** Given a scenario involving hazardous materials/WMD and detection and monitoring devices provided by the AHJ, the operations level responder assigned to perform air monitoring and sampling shall demonstrate the field test and operation of each device and interpret the readings based on local procedures.

**6.7.4.2** The operations level responder assigned to perform air monitoring and sampling shall describe local procedures for decontamination of themselves and their detection and monitoring devices upon completion of the air monitoring mission.

**6.7.5 Competencies — Evaluating Progress. (Reserved)**

**6.7.6 Competencies — Terminating the Incident. (Reserved)**

**6.8 Mission-Specific Competencies: Victim Rescue and Recovery.**

**6.8.1 General.**

**6.8.1.1 Introduction.**

**6.8.1.1.1** The operations level responder assigned to perform victim rescue and recovery shall be that person, competent at the operations level, who is assigned to rescue and recover exposed and contaminated victims at hazardous materials/WMD incidents.

**6.8.1.1.2** The operations level responder assigned to perform victim rescue and recovery at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), and all competencies in this section.

**6.8.1.1.3** The operations level responder assigned to perform victim rescue and recovery at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.8.1.1.4\*** The operations level responder assigned to perform victim rescue and recovery at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

#### **6.8.1.2 Goal.**

**6.8.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned victim rescue and recovery at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in

6.8.1.2.2 safely and effectively.

**6.8.1.2.2** When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform victim rescue and recovery shall be able to perform the following tasks:

(1) Plan a response for victim rescue and recovery operations involving the release of hazardous materials/WMD agent within the capabilities of available personnel and personal protective equipment

(2) Implement the planned response to accomplish victim rescue and recovery operations within the capabilities of available personnel and personal protective equipment

#### **6.8.2 Competencies — Analyzing the Incident. (Reserved)**

#### **6.8.3 Competencies — Planning the Response.**

**6.8.3.1** Given scenarios involving hazardous materials/WMD incidents, the operations level responder assigned to victim rescue and recovery shall determine the feasibility of conducting victim rescue and recovery operations at an incident involving hazardous materials/WMD and shall be able to perform the following tasks:

(1) Determine the feasibility of conducting rescue and recovery operations

(2) Describe the safety procedures, tactical guidelines, and incident response considerations to effect a rescue associated with each of the following situations:

(a) Line-of-sight with ambulatory victims

(b) Line-of-sight with non-ambulatory victims

(c) Non-line-of-sight with ambulatory victims

(d) Non-line-of-sight with non-ambulatory victims

(e) Victim rescue operations versus victim recovery operations

(3) Determine if the options are within the capabilities of available personnel and personal protective equipment

(4) Describe the procedures for implementing victim rescue and recovery operations within the incident command system

**6.8.3.2 Selecting Personal Protective Equipment (PPE).** Given the PPE provided by the AHJ, the operations level responder assigned to perform victim rescue and recovery shall select the personal protective equipment required to support victim rescue and recovery at hazardous materials/WMD incidents based on local procedures (*see Section 6.2*).

#### **6.8.4 Competencies — Implementing the Planned Response.**

**6.8.4.1** Given a scenario involving hazardous materials/WMD, the operations level responder assigned to victim rescue and recovery shall perform the following tasks:

(1) Identify the different team positions and describe their main functions

(2) Select and use specialized rescue equipment and procedures provided by the AHJ to support victim rescue and recovery operations

(3) Demonstrate safe and effective methods for victim rescue and recovery

(4) Demonstrate the ability to triage victims

(5) Describe local procedures for performing decontamination upon completion of the victim rescue and removal mission

#### **6.8.5 Competencies — Evaluating Progress. (Reserved)**

#### **6.8.6 Competencies — Terminating the Incident. (Reserved)**

### **6.9 Mission-Specific Competencies: Response to Illicit Laboratory Incidents.**

#### **6.9.1 General.**

##### **6.9.1.1 Introduction.**

**6.9.1.1.1** The operations level responder assigned to respond to illicit laboratory incidents shall be that person, competent at the operations level, who, at hazardous materials/WMD incidents involving potential violations of criminal statutes specific to the illegal manufacture of methamphetamines, other drugs, or WMD, is assigned to secure the scene, identify the laboratory or process, and preserve evidence at hazardous materials/WMD incidents involving potential violations of criminal statutes specific to the illegal manufacture of methamphetamines, other drugs, or WMD.

**6.9.1.1.2** The operations level responder who responds to illicit laboratory incidents shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), and all competencies in this section.

**6.9.1.1.3** The operations level responder who responds to illicit laboratory incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

**6.9.1.1.4\*** The operations level responder who responds to illicit laboratory incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

**6.9.1.2 Goal.**

**6.9.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned to respond to illicit laboratory incidents with the knowledge and skills to perform the tasks in 6.9.1.2.2 safely and effectively.

**6.9.1.2.2** When responding to hazardous materials/WMD incidents, the operations level responder assigned to respond to illicit laboratory incidents shall be able to perform the following tasks:

- (1) Analyze a hazardous materials/WMD incident to determine the complexity of the problem and potential outcomes and whether the incident is potentially a criminal illicit laboratory operation
- (2) Plan a response for a hazardous materials/WMD incident involving potential illicit laboratory operations in compliance with evidence preservation operations within the capabilities and competencies of available personnel, personal protective equipment, and control equipment after notifying the responsible law enforcement agencies of the problem
- (3) Implement the planned response to a hazardous materials/WMD incident involving potential illicit laboratory operations utilizing applicable evidence preservation guidelines

**6.9.2 Competencies — Analyzing the Incident.**

**6.9.2.1 Determining If a Hazardous Materials/WMD Incident Is an Illicit Laboratory Operation.** Given examples of hazardous materials/WMD incidents involving illicit laboratory operations, the operations level responder assigned to respond to illicit laboratory incidents shall identify the potential drugs/WMD being manufactured by completing 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

**6.9.3 Competencies — Planning the Response.**

**6.9.3.1 Determining the Response Options.** Given an analysis of hazardous materials/WMD incidents involving illicit laboratories, the operations level responder assigned to respond to illicit laboratory incidents shall identify possible response options.

**6.9.3.2 Identifying Unique Aspects of Criminal Hazardous Materials/WMD Incidents.**

**6.9.3.2.1** The operations level responder assigned to respond to illicit laboratory incidents shall identify the unique operational aspects associated with illicit drug manufacturing and illicit WMD manufacturing.

**6.9.3.2.2** Given an incident involving illicit drug manufacturing or illicit WMD manufacturing, the operations level responder assigned to illicit laboratory incidents shall describe the following tasks:

- (1) Law enforcement securing and preserving the scene
- (2) Joint hazardous materials and EOD personnel site reconnaissance and hazard identification
- (3) Determining atmospheric hazards through air monitoring and detection
- (4) Mitigation of immediate hazards while preserving evidence
- (5) Coordinated crime scene operation with the law enforcement agency having investigative authority
- (6) Documenting personnel and scene activities associated with incident

**6.9.3.3 Identifying the Law Enforcement Agency That Has Investigative Jurisdiction.** The operations level responder assigned to respond to illicit laboratory incidents shall identify the law enforcement agency having investigative jurisdiction by completing the following:

- (1) Given scenarios involving illicit drug manufacturing or illicit WMD manufacturing, identify the law enforcement agency(s) with investigative authority for the following situations:
  - (a) Illicit drug manufacturing
  - (b) Illicit WMD manufacturing
  - (c) Environmental crimes resulting from illicit laboratory operations

**6.9.3.4 Identifying Unique Tasks and Operations at Sites Involving Illicit Laboratories.**

**6.9.3.4.1** The operations level responder assigned to respond to illicit laboratory incidents shall identify and describe the unique tasks and operations encountered at illicit laboratory scenes.

**6.9.3.4.2** Given scenarios involving illicit drug manufacturing or illicit WMD manufacturing, describe the following:

- (1) Hazards, safety procedures, and tactical guidelines for this type of emergency
- (2) Factors to be evaluated in selection of the appropriate personal protective equipment for each type of tactical operation
- (3) Factors to be considered in selection of appropriate decontamination procedures
- (4) Factors to be evaluated in the selection of detection devices
- (5) Factors to be considered in the development of a remediation plan

**6.9.3.5 Selecting Personal Protective Equipment (PPE).** Given the PPE provided by the AHJ, the operations level responder assigned to respond to illicit laboratory incidents shall select the personal protective equipment required to respond to illicit laboratory incidents based on local procedures. (*See Section 6.2.*)

**6.9.4 Competencies — Implementing the Planned Response.**

**6.9.4.1 Implementing the Planned Response.** Given scenarios involving an illicit drug/WMD laboratory operation involving hazardous materials/WMD, the operations level responder assigned to respond to illicit laboratory incidents shall implement or oversee the implementation of the selected response options safely and effectively.

**6.9.4.1.1** Given a simulated illicit drug/WMD laboratory incident, the operations level responder assigned to respond to illicit laboratory incidents shall be able to perform the following tasks:

- (1) Describe safe and effective methods for law enforcement to secure the scene
- (2) Demonstrate decontamination procedures for tactical law enforcement personnel (SWAT or K-9) securing an illicit laboratory
- (3) Describe methods to identify and avoid potential unique safety hazards found at illicit laboratories such as booby traps and releases of hazardous materials
- (4) Describe methods to conduct joint hazardous materials/EOD operations to identify safety hazards and implement control procedures

**6.9.4.1.2** Given a simulated illicit drug/WMD laboratory entry operation, the operations level responder assigned to respond to illicit laboratory incidents shall describe methods for identifying the following during reconnaissance operations:

- (1) Potential manufacture of illicit drugs
- (2) Potential manufacture of illicit WMD materials
- (3) Potential environmental crimes associated with the manufacture of illicit drugs/WMD materials

**6.9.4.1.3** Given a simulated illicit drug/WMD laboratory incident, the operations level responder assigned to respond to illicit laboratory incidents shall describe joint agency crime scene operations, including support to forensic crime scene processing teams.

**6.9.4.1.4** Given a simulated illicit drug/WMD laboratory incident, the operations level responder assigned to respond to illicit laboratory incidents shall describe the policy and procedures for post-crime scene processing and site remediation operations.

**6.9.4.1.5** The operations level responder assigned to respond to illicit laboratory incidents shall describe local procedures for performing decontamination upon completion of the illicit laboratory mission.

**6.9.5 Competencies — Evaluating Progress. (Reserved)**

**6.9.6 Competencies — Terminating the Incident. (Reserved)**

**6.10 Mission-Specific Competencies: Disablement/Disruption of Improvised Explosives Devices (IEDs), Improvised WMD Dispersal Devices, and Operations at Improvised Explosives Laboratories.**

**6.10.1 General.**

**6.10.1.1 Introduction.**

**6.10.1.1.1** The operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall be that person, competent at the operations level, who is assigned to interrupt the functioning of an IED or an improvised WMD dispersal device or conduct operations at improvised explosives laboratories.

**6.10.1.1.2** The operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall possess current certification as a Hazardous Device Technician from the FBI Hazardous Devices School, Department of Defense, or equivalent certifying agency as determined by the AHJ and be functioning as a member of a bomb squad or recognized military unit.

**6.10.1.1.3** The operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), all mission-specific competencies for personal protective equipment (*see Section 6.2*), mission specific competencies for response to illicit laboratories (*see Section 6.9*), and all competencies in this section.

**6.10.1.1.4** The operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall operate under the guidance of an allied professional or standard operating procedures.

**6.10.1.1.5** The operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall receive the additional training necessary to meet the specific needs of the jurisdiction and/or agency.

**6.10.1.2 Goal.**

**6.10.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories with the knowledge and skills to perform the tasks in 6.10.1.2.2 and 6.10.1.2.3 safely and effectively.

**6.10.1.2.2** When responding to hazardous materials/WMD incidents involving a potential IED or improvised WMD dispersal device, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall be able to perform the following tasks:

- (1) Analyze a hazardous materials/WMD incident involving an improvised WMD dispersal device to determine the complexity of the problem and potential outcomes by completing the following tasks:
  - (a) Determine if an IED or WMD dispersal device is potentially present
  - (b) Categorize the device by its delivery method
- (2) Plan a response for a hazardous materials/WMD incident where there is a potential improvised WMD dispersal device within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks
  - (a) Determine if response options can be effectively employed to conduct a disablement/disruption of the device
  - (b) Describe the actions to be taken and the resources to be requested if the incident exceeds the available capabilities
- (3) Implement the planned response to a hazardous materials/WMD incident involving an IED or WMD dispersal device by completing the following tasks under the guidance of the senior hazardous devices technician (HDT) present:
  - (a) Employ disablement/disruption techniques in accordance with the FBI Hazardous Devices School “logic tree,” the current edition of the National Bomb Squad Commanders Advisory Board (NBSCAB) “A Model for Bomb Squad Standard Operating Procedures,” established protocol of military units, or the AHJ

**6.10.1.2.3** When responding to hazardous materials/WMD incidents involving potential improvised explosives laboratories, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall be able to perform the following tasks:

- (1) Analyze a hazardous materials/WMD incident involving a potential improvised explosives laboratory to determine the complexity of the problem and potential outcomes and whether the incident is potentially an improvised explosives laboratory operation
- (2) Plan a response to a hazardous materials/WMD incident involving a potential improvised explosives laboratory in compliance with mitigation techniques and evidence recovery within the capabilities and competencies of available personnel, personal protective equipment, and control equipment, after notifying the responsible investigative agencies of the problem
- (3) Implement the planned response to a hazardous materials/WMD incident involving a potential improvised explosives laboratory utilizing applicable standard operating procedures and/or technical advice from qualified allied professionals

**6.10.2 Competencies —Analyzing the Incident.**

**6.10.2.1 Determining If the Incident Involves the Potential**

**Presence of an Improvised WMD Dispersal Device.** Given examples of hazardous materials/WMD incidents involving an IED or improvised WMD dispersal device, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall identify and/or categorize the hazard by completing the following:

- (1) Given examples of the following hazardous materials/WMD incidents involving an IED or improvised WMD dispersal device, describe products that might be encountered in the incident associated with each situation:
  - (a) Letter/package-based improvised dispersal device
  - (b) Briefcase/backpack-based improvised dispersal device
  - (c) Transportation-borne WMD dispersal device
  - (d) Fixed location hazards where an IED has been placed to cause the deliberate release of a material

**6.10.2.2 Determining If the Hazardous Materials/WMD Incident Involves an Improvised Explosives Laboratory Operation.**

Given examples of hazardous materials/WMD incidents involving improvised explosives laboratories, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall identify the potential explosives/WMD being manufactured by completing the following related requirements:

- (1) Given examples of improvised explosives manufacturing methods, describe the operational considerations, hazards, and products involved in the process
- (2) Given examples of improvised explosives laboratory operations, describe the potential booby traps that have been encountered by response personnel
- (3) Given examples of improvised explosives laboratory operations, describe the agencies that have investigative authority and operational responsibility to support the response

### **6.10.3 Competencies — Planning the Response.**

**6.10.3.1 Identifying Unique Aspects of Improvised WMD Dispersal Device Related Hazardous Materials/WMD Incidents.** When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratory incidents shall be capable of identifying the unique aspects associated with such incidents by completing the following requirements:

- (1) Given an incident involving a nonvehicle based WMD dispersal device, shall be able to perform the following tasks:
  - (a) Describe the hazards, safety procedures, and tactical guidelines for this type of incident
  - (b) Describe the factors to be evaluated in selecting the personal protective equipment
  - (c) Describe the procedure for identifying and obtaining the appropriate emergency response elements to support disablement/disruption activities
- (2) Given an incident involving a vehicle-borne WMD dispersal device, shall be able to perform the following tasks:
  - (a) Describe the hazards, safety procedures, and tactical guidelines for this type of incident
  - (b) Describe the factors to be evaluated in selecting the personal protective equipment
  - (c) Describe the procedure for identifying and obtaining the appropriate emergency response elements to support disablement/disruption activities
- (3) Given examples of different types of incidents involving an improvised WMD dispersal device, shall identify and describe the application use and limitations of various types of field screening tools that can be utilized for determining the presence of the following materials:
  - (a) Gamma and neutron radiation
  - (b) Explosive materials [commercial and homemade explosives (HME)]

**6.10.3.2 Identifying Unique Aspects of Improvised Explosives Laboratory Related Hazardous Materials/WMD Incidents.** When responding to conduct mitigation procedures on energetic materials at an improvised explosive laboratory, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives shall be capable of identifying the unique aspects associated with such incidents by completing the following requirements:

- (1) Given a scenario involving an improvised explosive laboratory and detection devices provided by the AHJ, complete the following:
  - (a) Describe the hazards, safety procedures, and tactical guidelines for this type of incident
  - (b) Describe the factors to be evaluated in selecting the personal protective equipment
  - (c) Describe the application, use, and limitations of various types of field screening tools that can be utilized for determining the presence of the following materials:
    - i. Radioactive materials that emit alpha, beta, gamma, or neutron radiation, including radionuclide identification of gamma emitting radioactive materials
    - ii. Explosive materials (commercial and HME)
  - (d) Demonstrate the field test and operation of each detection device and interpret the readings based on local procedures
  - (e) Describe local procedures for decontamination of themselves and their detection devices upon completion of the material detection mission
  - (f) Describe the procedure for identifying and obtaining the appropriate emergency response elements to support disablement/disruption or mitigation activities

### **6.10.3.3 Identifying Potential Response Options.**

**6.10.3.3.1** Given scenarios involving a potential IED or improvised WMD materials dispersal device, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories incident shall identify possible response options.

**6.10.3.3.2** Given scenarios involving a potential improvised explosives laboratories, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories incident shall identify possible response options.

**6.10.3.4 Selecting Personal Protective Equipment.** Given the personal protective equipment provided by the AHJ, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories incident, shall select the personal protective equipment required to support such operations at hazardous materials/WMD incidents based on the National Guidelines for Bomb Technicians adopted by the National Bomb Squad Commanders Advisory Board (NBSCAB) (*see Section 6.2*).

### **6.10.4 Competencies — Implementing the Planned Response.**

**6.10.4.1** Given scenarios involving a potential IED or improvised WMD dispersal device, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratory incident shall be able to complete the following tasks:

- (1) Using detection and monitoring devices provided by the AHJ, demonstrate the field test and operation of each device and interpret the readings based on local or agency procedures
- (2) Perform diagnostics based on procedures instructed by a nationally accredited hazardous devices school or program

(3) Perform disablement/disruption techniques in accordance with the FBI Hazardous Devices School “logic tree,” the NBSCAB *A Model for Bomb Squad Standard Operating Procedures*, established protocol for military units, or established protocol of the AHJ

(4) Assist in planning the air monitoring and sampling activities within the capabilities and competencies of available personnel, personal protective equipment, and control equipment; and in accordance with the AHJ, describe the air monitoring and sampling options available

(5) Given the air monitoring and sampling equipment provided by the AHJ, shall complete the following:

(a) Select the detection or monitoring equipment suitable for detecting or monitoring of the IED or improvised WMD dispersal device

(b) Describe the operation, capabilities, limitations, local monitoring procedures, field-testing, and maintenance procedures associated with each device provided by the AHJ

(c) Describe local procedures for decontamination of the detection and monitoring devices upon completion of the mission

**6.10.4.2** Given a simulated improvised explosives laboratory incident, the operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratory incident shall be able to perform the following tasks:

(1) Describe the safe and effective methods for law enforcement to secure the scene

(2) Demonstrate methods to identify and avoid unique safety hazards at improvised explosives laboratories such as booby traps, releases of hazardous materials, and initiating components

(3) Using detection and monitoring devices provided by the AHJ, demonstrate the field test and operation of each device and interpret the readings based on local or agency procedures

(4) Describe the methods that could be utilized to mitigate the hazards identified

**6.10.4.3** The operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall demonstrate the ability to wear an appropriate combination of chemical protective clothing, respiratory protection, and ballistic protection for the hazards identified in 6.10.2.1 and 6.10.2.2.

**6.10.4.4** The operations level responder assigned to perform disablement/disruption of IEDs, improvised WMD dispersal devices, and operations at improvised explosives laboratories shall describe the local procedures for the technical decontamination process.

**6.10.5 Competencies — Evaluating Progress. (Reserved)**

**6.10.6 Competencies—Terminating the Incident (Reserved)**

## **Chapter 7 Competencies for Hazardous Materials Technicians**

### **7.1 General.**

#### **7.1.1 Introduction.**

**7.1.1.1** The hazardous materials technician shall be that person who responds to hazardous materials/WMD incidents using a risk-based response process by which he or she analyzes a problem involving hazardous materials/WMD, selects applicable decontamination procedures, and controls a release using specialized protective clothing and control equipment (*see 7.1.2.2*).

**7.1.1.2** The hazardous materials technician shall be trained to meet all competencies at the awareness level (*see Chapter 4*), all core competencies at the operations level (*see Chapter 5*), and all competencies of this chapter.

**7.1.1.3\*** The hazardous materials technician shall receive additional training to meet applicable governmental occupational health and safety regulations.

**7.1.1.4** The hazardous materials technician shall be permitted to have additional competencies that are specific to the response mission, expected tasks, equipment, and training as determined by the AHJ.

#### **7.1.2 Goal.**

**7.1.2.1** The goal of the competencies in this chapter shall be to provide the hazardous materials technician with the knowledge and skills to perform the tasks in 7.1.2.2 safely.

**7.1.2.2** In addition to being competent at both the awareness and the operations levels, the hazardous materials technician shall be able to perform the following tasks:

(1) Analyze a hazardous materials/WMD incident to determine the complexity of the problem and potential outcomes by completing the following tasks:

(a) Survey the hazardous materials/WMD incident to identify special containers involved, to identify or classify unknown materials, and to verify the presence and concentrations of hazardous materials through the use of monitoring equipment

(b) Collect and interpret hazard and response information from printed and technical resources, computer databases, and monitoring equipment

(c) Describe the type and extent of damage to containers

(d) Predict the likely behavior of released materials and their containers when multiple materials are involved

(e) Estimate the size of an endangered area using computer modeling, monitoring equipment, or specialists

in this field

(2) Plan a response within the capabilities of available personnel, personal protective equipment, and control equipment by completing the following tasks:

- (a) Describe the response objectives for hazardous materials/WMD incidents
- (b) Describe the potential response options available by response objective
- (c) Select the personal protective equipment required for a given action option
- (d) Select a technical decontamination process to minimize the hazard
- (e) Develop an incident action plan for a hazardous materials/WMD incident, including a site safety and control plan, consistent with the emergency response plan or standard operating procedures and within the capability of the available personnel, personal protective equipment, and control equipment

(3)\*Implement the planned response to favorably change the outcomes consistent with the standard operating procedures and site safety and control plan by completing the following tasks:

- (a) Perform the duties of an assigned hazardous materials branch or group position within the local incident management system (IMS)
- (b) Don, work in, and doff personal protective clothing, including, but not limited to, both liquid splash- and vapor-protective clothing with correct respiratory protection
- (c) Perform the control functions identified in the incident action plan
- (d) Perform the decontamination functions identified in the incident action plan

(4) Evaluate the progress of the planned response by completing the following tasks:

- (a) Evaluate the effectiveness of the control functions
- (b) Evaluate the effectiveness of the decontamination process

(5) Terminate the incident by completing the following tasks:

- (a) Assist in the incident debriefing
- (b) Assist in the incident critique
- (c) Provide reports and documentation of the incident

## **7.2 Competencies —Analyzing the Incident.**

**7.2.1 Surveying Hazardous Materials/WMD Incidents.** Given examples of hazardous materials/WMD incidents, the hazardous materials technician shall identify containers involved and, given the necessary equipment, identify or classify unknown materials involved, verify the identity of the hazardous materials/WMD involved, and determine the concentration of hazardous materials, by completing the requirements of 7.2.1.1 through 7.2.1.5.

**7.2.1.1** Given examples of various containers for hazardous materials/WMD, the hazardous materials technician shall identify each container by name and specification and identify the typical contents by name and hazard class.

**7.2.1.1.1** Given examples of the following railroad cars, the hazardous materials technician shall identify the container by name and specification and identify the typical contents by name and hazard class:

- (1) Cryogenic liquid tank cars
- (2) Non-pressure tank cars
- (3) Pneumatically unloaded hopper cars
- (4) Pressure tank cars

**7.2.1.1.2** Given examples of the following intermodal tanks, the hazardous materials technician shall identify the container by name and specification and identify the typical contents by name and hazard class:

- (1) Non-pressure intermodal tanks
  - (a) IM-101 portable tanks (IMO Type 1 internationally)
  - (b) IM-102 portable tanks (IMO Type 2 internationally)
- (2) Pressure intermodal tank (DOT Specification 51; IMO Type 5 internationally)
- (3) Specialized intermodal tanks
  - (a) Cryogenic intermodal tanks (IMO Type 7 internationally)
  - (b) Tube modules

**7.2.1.1.3** Given examples of the following cargo tanks, the hazardous materials technician shall identify the container by name and specification and identify the typical contents by name and hazard class:

- (1) Compressed gas tube trailers
- (2) Corrosive liquid tanks
- (3) Cryogenic liquid tanks
- (4) Dry bulk cargo tanks
- (5) High-pressure tanks
- (6) Low-pressure chemical tanks
- (7) Non-pressure liquid tanks

**7.2.1.1.4** Given examples of the following facility storage tanks, the hazardous materials technician shall identify the container by name and identify the typical contents by name and hazard class:

- (1) Cryogenic liquid tank
- (2) Non-pressure tank
- (3) Pressure tank



**7.2.1.1.5** Given examples of the following non-bulk packaging, the hazardous materials technician shall identify the package by name and identify the typical contents by name and hazard class:

- (1) Bags
- (2) Carboys
- (3) Cylinders
- (4) Drums

**7.2.1.1.6** Given examples of the following radioactive materials packages, the hazardous materials technician shall identify the container/package by name and identify the typical contents by name:

- (1) Excepted
- (2) Industrial
- (3) Type A
- (4) Type B
- (5) Type C

**7.2.1.1.7** Given examples of the following packaging, the hazardous materials technician shall identify the package by name and identify the typical contents by name and hazard class:

- (1) Intermediate bulk container (IBC)
- (2) Ton container

**7.2.1.2** Given examples of three facility and three transportation containers, the hazardous materials technician shall identify the approximate capacity of each container.

**7.2.1.2.1** Using the markings on the container, the hazardous materials technician shall identify the capacity (by weight or volume) of the following examples of transportation vehicles:

- (1) Cargo tanks
- (2) Tank cars
- (3) Tank containers

**7.2.1.2.2** Using the markings on the container and other available resources, the hazardous materials technician shall identify the capacity (by weight or volume) of each of the following facility containers:

- (1) Cryogenic liquid tank
- (2) Non-pressure tank (general service or low-pressure tank)
- (3) Pressure tank

**7.2.1.3\*** Given at least three unknown hazardous materials/WMD, one of which is a solid, one a liquid, and one a gas, the hazardous materials technician shall identify or classify by hazard each unknown material.

**7.2.1.3.1** The hazardous materials technician shall identify the steps in an analysis process for identifying unknown solid and liquid materials.

**7.2.1.3.2** The hazardous materials technician shall identify the steps in an analysis process for identifying an unknown atmosphere.

**7.2.1.3.3** The hazardous materials technician shall identify the type(s) of monitoring technology used to determine the following hazards:

- (1) Corrosivity
- (2) Flammability
- (3) Oxidation potential
- (4) Oxygen deficiency
- (5) Pathogenicity
- (6) Radioactivity
- (7) Toxicity

**7.2.1.3.4\*** The hazardous materials technician shall identify the capabilities and limiting factors associated with the selection and use of the following monitoring equipment, test strips, and reagents:

- (1) Biological immunoassay indicators
- (2) Chemical agent monitors (CAMs)
- (3) Colorimetric indicators [colorimetric detector tubes, indicating papers (pH paper and meters), reagents, test strips]
- (4) Combustible gas indicator
- (5) DNA fluoroscopy
- (6) Electrochemical cells (carbon monoxide meter, oxygen meter)
- (7) Flame ionization detector
- (8) Gas chromatograph/mass spectrometer (GC/MS)
- (9) Infrared spectroscopy
- (10) Ion mobility spectroscopy
- (11) Gamma spectrometer [radioisotope identification device (RIID)]
- (12) Metal oxide sensor
- (13) Photoionization detectors
- (14) Polymerase chain reaction (PCR)
- (15) Radiation detection and measurement instruments

- (16) Raman spectroscopy
- (17) Surface acoustical wave (SAW)
- (18) Wet chemistry

**7.2.1.3.5\*** Given three hazardous materials/WMD, one of which is a solid, one a liquid, and one a gas, and using equipment, test strips, and reagents, provided by the AHJ as applicable, the hazardous materials technician shall select from the following equipment and demonstrate the correct techniques to identify the hazards (corrosivity, flammability, oxidation potential, oxygen deficiency, radioactivity, toxicity, and pathogenicity):

- (1) Carbon monoxide meter
- (2) Colorimetric tubes
- (3) Combustible gas indicator
- (4) Oxygen meter
- (5) Passive dosimeters
- (6) pH indicators and/or pH meters
- (7) Photoionization and flame ionization detectors
- (8) Radiation detection instruments
- (9) Reagents
- (10) Test strips
- (11) WMD detectors (chemical and biological)
- (12) Other equipment provided by the AHJ

**7.2.1.3.6** Given monitoring equipment, test strips, and reagents provided by the AHJ, the hazardous materials technician shall demonstrate the field maintenance and testing procedures for those items.

**7.2.1.4\*** Given a label for a radioactive material, the hazardous materials technician shall identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable, then describe the radiation dose rates associated with each label.

**7.2.1.5** The hazardous materials technician shall demonstrate methods for collecting samples of the following:

- (1) Gas
- (2) Liquid
- (3) Solid

**7.2.2 Collecting and Interpreting Hazard and Response Information.** Given access to printed and technical resources, computer databases, and monitoring equipment, the hazardous materials technician shall collect and interpret hazard and response information not available from the current edition of the DOT *Emergency Response Guidebook* or an MSDS and shall meet the requirements of 7.2.2.1 through 7.2.2.6.

**7.2.2.1\*** The hazardous materials technician shall identify and interpret the types of hazard and response information available from each of the following resources and explain the advantages and disadvantages of each resource:

- (1) Hazardous materials databases
- (2) Monitoring equipment
- (3) Reference manuals
- (4) Technical information centers (i.e., CHEMTREC/ CANUTEC/SETIQ and local, state, and federal authorities)
- (5) Technical information specialists

**7.2.2.2** The hazardous materials technician shall describe the following terms and explain their significance in the analysis process:

- (1) Corrosive (acids and bases/alkaline)
- (2) Air reactivity
- (3) Auto-refrigeration
- (4) Biological agents and biological toxins
- (5) Blood agents
- (6) Boiling point
- (7) Catalyst
- (8) Chemical change
- (9) Chemical interactions
- (10) Compound, mixture
- (11) Concentration
- (12) Critical temperature and pressure
- (13) Dissociation (acid/base)
- (14) Dose
- (15) Dose response
- (16) Expansion ratio
- (17) Fire point
- (18) Flammable (explosive) range (LEL and UEL)
- (19) Flashpoint
- (20) Half-life

- (21) Halogenated hydrocarbon
- (22) Ignition (auto-ignition) temperature
- (23) Inhibitor
- (24) Instability
- (25) Ionic and covalent compounds
- (26) Irritants (riot control agents)
- (27) Maximum safe storage temperature (MSST)
- (28) Melting point and freezing point
- (29) Miscibility
- (30) Nerve agents
- (31) Organic and inorganic
- (32) Oxidation potential
- (33) Persistence
- (34) pH
- (35) Physical change
- (36) Physical state (solid, liquid, gas)
- (37) Polymerization
- (38) Radioactivity
- (39) Reactivity
- (40) Riot control agents
- (41) Saturated, unsaturated (straight and branched), and aromatic hydrocarbons
- (42) Self-accelerating decomposition temperature (SADT)
- (43) Solubility
- (44) Solution and slurry
- (45) Specific gravity
- (46) Strength
- (47) Sublimation
- (48) Temperature of product
- (49) Toxic products of combustion
- (50) Vapor density
- (51) Vapor pressure
- (52) Vesicants (blister agents)
- (53) Viscosity
- (54) Volatility

**7.2.2.3** The hazardous materials technician shall describe the heat transfer processes that occur as a result of a cryogenic liquid spill.

**7.2.2.4\*** Given five hazardous materials/WMD scenarios and the associated reference materials, the hazardous materials technician shall identify the signs and symptoms of exposure to each material and the target organ effects of exposure to that material.

**7.2.2.5** The hazardous materials technician shall identify two methods for determining the pressure in bulk packaging or facility containers.

**7.2.2.6** The hazardous materials technician shall identify one method for determining the amount of lading remaining in damaged bulk packaging or facility containers.

**7.2.3\* Describing the Condition of the Container Involved in the Incident.** Given examples of container damage, the hazardous materials technician shall describe the damage by completing the related requirements of 7.2.3.1 through 7.2.3.5.

**7.2.3.1\*** Given examples of containers, including the DOT specification markings for non-bulk and bulk packaging, and associated reference guides, the hazardous materials technician shall identify the basic design and construction features of each container.

**7.2.3.1.1** The hazardous materials technician shall identify the basic design and construction features, including closures, of the following bulk containers:

- (1) Cargo tanks
  - (a) Compressed gas tube trailers
  - (b) Corrosive liquid tanks
  - (c) Cryogenic liquid tanks
  - (d) Dry bulk cargo tanks
  - (e) High-pressure tanks
  - (f) Low-pressure liquid tanks
  - (g) Non-pressure liquid tanks
- (2) Fixed facility tanks
  - (a) Cryogenic liquid tanks
  - (b) Non-pressure tanks

- (c) Pressure tanks
- (3) Intermediate bulk containers (also known as tote tanks)
- (4) Intermodal tanks
  - (a) Non-pressure intermodal tanks
    - i. IM-101 portable tank (IMO Type 1 internationally)
    - ii. IM-102 portable tank (IMO Type 2 internationally)
  - (b) Pressure intermodal tanks (DOT Specification 51; IMO Type 5 internationally)
  - (c) Specialized intermodal tanks
    - i. Cryogenic intermodal tanks (IMO Type 7 internationally)
    - ii. Tube modules
- (5) One-ton containers (pressure drums)
- (6) Pipelines
- (7) Railroad cars
  - (a) Cryogenic liquid tank cars
  - (b) Non-pressure tank cars
  - (c) Pneumatically unloaded hopper cars
  - (d) Pressure tank cars

**7.2.3.1.2** The hazardous materials technician shall identify the basic design and construction features, including closures of the following non-bulk containers:

- (1) Bags
- (2) Carboys
- (3) Drums
- (4) Cylinders

**7.2.3.1.3** The hazardous materials technician shall identify the basic design features and testing requirements on the following radioactive materials packages:

- (1) Excepted
- (2) Industrial
- (3) Type A
- (4) Type B
- (5) Type C

**7.2.3.2** The hazardous materials technician shall describe how a liquid petroleum product pipeline can carry different products.

**7.2.3.3** Given an example of a pipeline, the hazardous materials technician shall identify the following:

- (1) Ownership of the line
- (2) Procedures for checking for gas migration
- (3) Procedure for shutting down the line or controlling the leak
- (4) Type of product in the line

**7.2.3.4\*** Given examples of container stress or damage, the hazardous materials technician shall identify the type of damage in each example and assess the level of risk associated with the damage.

**7.2.3.5** Given a scenario involving radioactive materials, the hazardous materials technician, using available survey and monitoring equipment, shall determine if the integrity of any container has been breached.

**7.2.4 Predicting Likely Behavior of Materials and Their Containers Where Multiple Materials Are Involved.**

Given examples of hazardous materials/WMD incidents involving multiple hazardous materials or WMD, the hazardous materials technician shall predict the likely behavior of the material in each case and meet the requirements of 7.2.4.1 through 7.2.4.3.

**7.2.4.1** The hazardous materials technician shall identify at least three resources available that indicate the effects of mixing various hazardous materials.

**7.2.4.2** The hazardous materials technician shall identify the impact of the following fire and safety features on the behavior of the products during an incident at a bulk liquid facility and explain their significance in the analysis process:

- (1) Fire protection systems
- (2) Monitoring and detection systems
- (3) Pressure relief and vacuum relief protection
- (4) Product spillage and control (impoundment and diking)
- (5) Tank spacing
- (6) Transfer operations

**7.2.4.3** The hazardous materials technician shall identify the impact of the following fire and safety features on the behavior of the products during an incident at a bulk gas facility and explain their significance in the analysis process:

- (1) Fire protection systems
- (2) Monitoring and detection systems
- (3) Pressure relief protection
- (4) Transfer operations

**7.2.5 Estimating the Likely Size of an Endangered Area.** Given examples of hazardous materials/WMD incidents, the hazardous materials technician shall estimate the likely size, shape, and concentrations associated with the release of materials involved in an incident by using computer modeling, monitoring equipment, or specialists in this field by completing the requirements of 7.2.5.1 through 7.2.5.4.

**7.2.5.1** Given the emergency response plan, the hazardous materials technician shall identify resources for dispersion pattern prediction and modeling, including computers, monitoring equipment, or specialists in the field.

**7.2.5.2** Given the quantity, concentration, and release rate of a material, the hazardous materials technician shall identify the steps for determining the likely extent of the physical, safety, and health hazards within the endangered area of a hazardous materials/WMD incident.

**7.2.5.2.1** The hazardous materials technician shall describe the following terms and exposure values and explain their significance in the analysis process:

- (1) Counts per minute (cpm) and kilocounts per minute (kcpm)
- (2) Immediately dangerous to life and health (IDLH) value
- (3) Incubation period
- (4) Infectious dose
- (5) Lethal concentrations (LC<sub>50</sub>)
- (6) Lethal dose (LD<sub>50</sub>)
- (7) Parts per billion (ppb)
- (8) Parts per million (ppm)
- (9) Permissible exposure limit (PEL)
- (10) Radiation absorbed dose (rad)
- (11) Roentgen equivalent man (rem), millirem (mrem), microrem (µrem)
- (12) Threshold limit value ceiling (TLV-C)
- (13) Threshold limit value short-term exposure limit (TLVSTEL)
- (14) Threshold limit value time-weighted average (TLV-TWA)

**7.2.5.2.2** The hazardous materials technician shall identify two methods for predicting the areas of potential harm within the endangered area of a hazardous materials/WMD incident.

**7.2.5.3\*** The hazardous materials technician shall identify the steps for estimating the outcomes within an endangered area of a hazardous materials/WMD incident.

**7.2.5.4** Given three examples involving a hazardous materials/WMD release and the corresponding instrument monitoring readings, the hazardous materials technician shall determine the applicable public protective response options and the areas to be protected.

### **7.3 Competencies — Planning the Response.**

#### **7.3.1 Identifying Response Objectives.**

**7.3.1.1** Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall describe the response objectives for each problem.

**7.3.1.2** Given an analysis of a hazardous materials/WMD incident, the hazardous materials technician shall be able to describe the steps for determining response objectives (defensive, offensive, and nonintervention).

#### **7.3.2 Identifying the Potential Response Options.**

**7.3.2.1** Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall identify the possible response options (defensive, offensive, and nonintervention) by response objective for each problem.

**7.3.2.2** The hazardous materials technician shall be able to identify the possible response options to accomplish a given response objective.

**7.3.3 Selecting Personal Protective Equipment.** Given scenarios of hazardous materials/WMD incidents with known and unknown hazardous materials/WMD, the hazardous materials technician shall determine the personal protective equipment for the response options specified in the incident action plan in each situation by completing the requirements of 7.3.3.1 through 7.3.3.4.8.

**7.3.3.1** The hazardous materials technician shall describe types of personal protective equipment that are available for response based on NFPA standards and how these items relate to EPA levels of protection.

**7.3.3.2** The hazardous materials technician shall identify and describe personal protective equipment options available for the following hazards:

- (1) Thermal
- (2) Radiological
- (3) Asphyxiating
- (4) Chemical (liquids and vapors)
- (5) Etiological (biological)
- (6) Mechanical (explosives)

**7.3.3.3** The hazardous materials technician shall identify the process to be considered in selecting respiratory protection for a specified action option.

**7.3.3.4** The hazardous materials technician shall identify the factors to be considered in selecting chemical-protective clothing for a specified action option.

**7.3.3.4.1** The hazardous materials technician shall describe the following terms and explain their impact and significance on the selection of chemical-protective clothing:

- (1) Degradation
- (2) Penetration
- (3) Permeation

**7.3.3.4.2** The hazardous materials technician shall identify at least three indications of material degradation of chemical protective clothing.

**7.3.3.4.3\*** The hazardous materials technician shall identify the different designs of vapor-protective and splash-protective clothing and describe the advantages and disadvantages of each type.

**7.3.3.4.4** The hazardous materials technician shall identify the relative advantages and disadvantages of the following heat exchange units used for the cooling of personnel in personal protective equipment:

- (1) Air cooled
- (2) Ice cooled
- (3) Water cooled
- (4) Phase change cooling technology

**7.3.3.4.5** The hazardous materials technician shall identify the process for selecting protective clothing at hazardous materials/WMD incidents.

**7.3.3.4.6** Given three examples of various hazardous materials, the hazardous materials technician shall determine the protective clothing construction materials for a given action option using chemical compatibility charts.

**7.3.3.4.7** The hazardous materials technician shall identify the physiological and psychological stresses that can affect users of personal protective equipment.

**7.3.3.4.8** Given the personal protective equipment provided by the AHJ, the hazardous materials technician shall identify the process for inspecting, testing, and maintenance of personal protective equipment.

**7.3.4 Selecting Decontamination Procedures.** Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall select a decontamination procedure that will minimize the hazard, shall determine the equipment required to implement that procedure, and shall complete the following tasks:

(1) Describe the advantages and limitations of each of the following decontamination methods:

- (a) Absorption
- (b) Adsorption
- (c) Chemical degradation
- (d) Dilution
- (e) Disinfecting
- (f) Evaporation
- (g) Isolation and disposal
- (h) Neutralization
- (i) Solidification
- (j) Sterilization
- (k) Vacuuming

(l) Washing

(2) Identify three sources of information for determining the applicable decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident

**7.3.5 Developing a Plan of Action.** Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall develop a plan of action, including site safety and a control plan, that is consistent with the emergency response plan and standard operating procedures and within the capability of available personnel, personal protective equipment, and control equipment for that incident by completing the requirements of 7.3.5.1 through 7.3.5.5.

**7.3.5.1** The hazardous materials technician shall describe the purpose of, procedures for, equipment required for, and safety precautions used with the following techniques for hazardous materials/WMD control:

- (1) Absorption
- (2) Adsorption
- (3) Blanketing
- (4) Covering
- (5) Damming
- (6) Diking
- (7) Dilution
- (8) Dispersion
- (9) Diversion
- (10) Fire suppression
- (11) Neutralization
- (12) Overpacking
- (13) Patching
- (14) Plugging

- (15) Pressure isolation and reduction (flaring; venting; vent and burn; isolation of valves, pumps, or energy sources)
- (16) Retention
- (17) Solidification
- (18) Transfer
- (19) Vapor control (dispersion, suppression)

**7.3.5.2** Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall develop the site safety and control plan that must be included as part of the incident action plan.

**7.3.5.2.1** The hazardous materials technician shall list and describe the safety considerations to be included.

**7.3.5.2.2** The hazardous materials technician shall identify the points that should be made in a safety briefing prior to working at the scene.

**7.3.5.3\*** The hazardous materials technician shall identify the atmospheric and physical safety hazards associated with hazardous materials/WMD incidents involving confined spaces.

**7.3.5.4** The hazardous materials technician shall identify the pre-entry activities to be performed.

**7.3.5.5** The hazardous materials technician shall identify the procedures, equipment, and safety precautions for preserving and collecting legal evidence at hazardous materials /WMD incidents.

#### **7.4 Competencies — Implementing the Planned Response.**

**7.4.1\* Performing Incident Command Duties.** Given the emergency response plan or standard operating procedures and a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall demonstrate the duties of an assigned function in the hazardous materials branch or group within the incident command system and shall identify the role of the hazardous materials technician during hazardous materials/WMD incidents.

**7.4.1.1** Describe the duties of an assigned function in the hazardous materials branch or group within the incident command system.

**7.4.1.2** Identify the role of the hazardous materials technician during hazardous materials/WMD incidents.

**7.4.2 Using Protective Clothing and Respiratory Protection.** The hazardous materials technician shall demonstrate the ability to don, work in, and doff liquid splash-protective, vapor-protective, and chemical-protective clothing and any other specialized personal protective equipment provided by the AHJ, including respiratory protection, and shall complete the following tasks:

- (1) Describe three safety procedures for personnel working in chemical-protective clothing
- (2)\*Describe three emergency procedures for personnel working in chemical-protective clothing
- (3) Demonstrate the ability to don, work in, and doff self-contained breathing apparatus in addition to any other respiratory protection provided by the AHJ
- (4) Demonstrate the ability to don, work in, and doff liquid splash-protective, vapor-protective, and chemical-protective clothing in addition to any other specialized protective equipment provided by the AHJ

**7.4.3 Performing Control Functions Identified in Incident Action Plan.** Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall select the tools, equipment, and materials for the control of hazardous materials/WMD incidents and identify the precautions for controlling releases from the packaging/containers and shall complete the following tasks:

(1)\*Given a pressure vessel, select the material or equipment and demonstrate a method(s) to contain leaks from the following locations:

- (a) Fusible plug
- (b) Fusible plug threads
- (c) Side wall of cylinder
- (d) Valve blowout
- (e) Valve gland
- (f) Valve inlet threads
- (g) Valve seat
- (h) Valve stem assembly blowout

(2)\*Given the fittings on a pressure container, demonstrate the ability to perform the following:

- (a) Close valves that are open
- (b) Replace missing plugs
- (c) Tighten loose plugs

(3) Given a 55 gal (208 L) drum and applicable tools and materials, demonstrate the ability to contain the following types of leaks:

- (a) Bung leak
- (b) Chime leak
- (c) Forklift puncture
- (d) Nail puncture

(4) Given a 55 gal (208 L) drum and an overpack drum, demonstrate the ability to place the 55 gal (208 L) drum into the overpack drum using the following methods:

- (a) Rolling slide-in
- (b) Slide-in
- (c) Slip-over

- (5) Identify the maintenance and inspection procedures for the tools and equipment provided for the control of hazardous materials releases according to the manufacturer's specifications and recommendations
- (6) Identify three considerations for assessing a leak or spill inside a confined space without entering the area
- (7)\*Identify three safety considerations for product transfer operations
- (8) Given an MC-306/DOT-406 cargo tank and a dome cover clamp, demonstrate the ability to install the clamp on the dome
- (9) Identify the methods and precautions used to control a fire involving an MC-306/DOT-406 aluminum shell cargo tank
- (10) Describe at least one method for containing each of the following types of leaks in MC-306/DOT-406, MC-307/DOT-407, and MC-312/DOT-412 cargo tanks:
  - a) Dome cover leak
  - (b) Irregular-shaped hole
  - (c) Puncture
  - (d) Split or tear

(11)\*Describe three product removal and transfer considerations for overturned MC-306/DOT-406, MC-307/DOT-407, MC-312/DOT-412, MC-331, and MC-338 cargo tanks

**7.4.4** Given MC-306/DOT-406, MC-307/DOT-407, MC-312/DOT-412, MC-331, and MC-338 cargo tanks, the hazardous materials technician shall identify the common methods for product transfer from each type of cargo tank.

**7.4.5\* Performing Decontamination Operations Identified in the Incident Action Plan.** The hazardous materials technician shall demonstrate the ability to set up and implement the following types of decontamination operations:

- (1) Technical decontamination operations in support of entry operations
- (2) Technical decontamination operations involving ambulatory and non-ambulatory victims
- (3) Mass decontamination operations involving ambulatory and non-ambulatory victims

#### **7.5 Competencies — Evaluating Progress.**

**7.5.1 Evaluating the Effectiveness of the Control Functions.** Given scenarios involving hazardous materials/WMD incidents and the incident action plan, the hazardous materials technician shall evaluate the effectiveness of any control functions identified in the incident action plan.

**7.5.2 Evaluating the Effectiveness of the Decontamination Process.** Given an incident action plan for a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall evaluate the effectiveness of any decontamination procedures identified in the incident action plan.

#### **7.6 Competencies — Terminating the Incident.**

**7.6.1 Assisting in the Debriefing.** Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall participate in the debriefing of the incident by completing the following requirements:

- (1) Describe three components of an effective debriefing
- (2) Describe the key topics of an effective debriefing
- (3) Describe when a debriefing should take place
- (4) Describe who should be involved in a debriefing

**7.6.2 Assisting in the Incident Critique.** Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall provide operational observations of the activities that were performed in the hot and warm zones during the incident and shall complete the following tasks:

- (1) Describe three components of an effective critique
- (2) Describe who should be involved in a critique
- (3) Describe why an effective critique is necessary after a hazardous materials/WMD incident
- (4) Describe which written documents should be prepared as a result of the critique

**7.6.3 Reporting and Documenting the Incident.** Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall complete reporting and documentation as required by the AHJ by completing the following requirements:

- (1) Identify the reports and supporting documentation required by the emergency response plan or standard operating procedures
- (2) Demonstrate completion of the reports and supporting documentation
- (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 hot zone entry and exit logs
- (9) Identify the requirements for compiling personal protective equipment logs
- (10) Identify the requirements for filing documents and maintaining records



Additional standards/competencies within NFPA 472 included:

- Competencies for Incident Commanders
- Competencies for Specialist Employees
- Competencies for Hazardous Materials Officers
- Competencies for Hazardous Materials Safety Officers
- Competencies for Hazardous Materials Technicians with a Tank Car Specialty
- Competencies for Hazardous Materials Technicians with a Cargo Tank Specialty
- Competencies for Hazardous Materials Technicians with an Intermodal Tank Specialty
- Competencies for Hazardous Materials Technicians with a Marine Tank and Non-Tank Vessel Specialty
- Competencies for Hazardous Materials Technicians with a Flammable Liquids Bulk Storage Specialty
- Competencies for Hazardous Materials Technicians with a Flammable Gases Bulk Storage Specialty
- Competencies for Hazardous Materials Technicians with a Radioactive Material Specialty

A full version of the NFPA 472 Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents may be obtained at [www.nfpa.org](http://www.nfpa.org)