Florida

EMERGENCY RESPONSE COMMISSION

for

Hazardous Materials

Guidelines for

Hazardous Materials Training

Florida Division of Emergency Management

2015 Edition

SERC Hazardous Materials Training Guidelines

2015 Edition

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2. Operations Level Personnel (55 pages) 2015
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Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**

Guidelines for Awareness Level Training

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

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Guidelines for Awareness Level Training

Introduction

Awareness level trained personnel shall be trained to meet the requirements for the first responder at the awareness level, as defined in OSHA 29 CFR 1910.120 (q)(i), and meet the competencies in these guidelines taken from NFPA 472, Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 edition.

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who encounter or respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illness, and disabilities to those who accidently or intentionally encounter an incident.

It shall not be the intention of these guidelines to restrict any organization/jurisdiction from exceeding these minimum requirements.

Definition of a Hazardous Materials Awareness Trained Personnel

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.

In addition, Awareness Trained Personnel are required to have:

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify the hazardous substances, if possible.
- An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
- The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

Goal

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 required tasks safely and effectively.

Tasks

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 and response 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.

    a. Initiate protective actions.

    b. Initiate the notification process.

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Hazardous Materials Awareness training can take place as an on-line program, traditional classroom setting, or a combination of both. The training should include specifics of the workplace and/or additional objectives required by the authority having jurisdiction (AHJ). It is recommended that the training include a table top or field activity involving working within an incident command structure.

It is recommended that the individual delivering Awareness Level training possess competency in the level of the planned training program delivery. An Instructor delivering an Awareness Program should be knowledgeable of the needs of those performing at the Operations level or above. The instructor should also be competent in adult instructional techniques.

Acronyms

AHJ – Authority Having Jurisdiction

DOT – Department of Transportation

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Association

UN/NA – United Nations/North America

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of awareness level personnel.

AWARE 1 Analyzing the Incident

AWARE 1.1 Detecting the Presence of Hazardous Materials/WMD

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

1. Definitions of both hazardous material (or dangerous goods, in Canada) and WMD
2. UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division.
3. Determine the hazards associated with each hazard class and division.
4. Difference between hazardous materials/WMD incidents and other emergencies
5. Occupancies and locations in the community where hazardous materials/WMD found
6. Container shapes that can indicate the presence of hazardous materials/WMD
7. Facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
    a. Transportation markings
    b. NFPA 704
    c. Military hazardous materials/WMD markings
    d. Special hazard communication markings
    e. Pipeline markings
    f. Container markings
8. NFPA 704 marking and describe the significance of the colors, numbers, and special symbols
9. U.S. and Canadian placards and labels that indicate hazardous materials/WMD
10. Basic information on material safety data sheets (MSDS) and shipping papers for hazardous materials including the location and sections in each.
11. Other clues to include sight, sound, and odor and the limitations of using the senses in determining the presence or absence of hazardous materials/WMD
12. Four types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD
13. The difference between a chemical and a biological incident
14. Four indicators of possible criminal or terrorist activity involving chemical agents, biological agents, radiologic agents, illicit laboratories (clandestine laboratories, weapons lab, ricin lab) explosives, and secondary devices.

AWARE 1.2 Surveying Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incidents, 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, identify:

1. Difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in transportation
2. Sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation
3. Sources for obtaining the names of hazardous materials/WMD at a facility

AWARE 1.3 Collecting Hazard Information

Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), 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 identify:

1. Methods for determining the guidebook page for a hazardous material/WMD
2. General types of hazards found on each guidebook page

AWARE 2 Implementing the Planned Response

AWARE 2.1 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,* identify the actions to be taken to protect themselves and others and to control access to the scene by completing the following requirements, identify:

1. The location of both the emergency response plan and/or standard operating procedures
2. The role of the awareness level personnel during hazardous materials/WMD incidents, including precautions taken to protect themselves, others, and providing emergency medical care to victims of hazardous materials/WMD incidents.
3. The following basic precautions to be taken to protect themselves and others in hazardous materials/WMD incidents, identify:
    a. The precautions necessary when providing emergency medical care to victims of hazardous materials/WMD incidents
    b. Typical ignition sources found at the scene of hazardous materials/WMD incidents

c. Ways hazardous materials/WMD are harmful to people, the environment, and property
d. 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

AWARE 2.2 Initiating the Notification Process

Given scenarios involving hazardous materials/WMD incidents, identify the initial notifications to be made and how to make them, consistent with the AHJ.

Summary: Awareness Level Training

Audience

These guidelines were developed for persons who could encounter an emergency involving hazardous materials/weapons of mass destruction (WMD) and are expected to recognize the presence of the hazardous materials/WMD, protect themselves, call for trained personnel, and secure the area.

Training

Awareness Level training can take place in a digital (on-line) format, traditional classroom format or a combination of both. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and any additional training to meet applicable governmental occupational health and safety regulations. The competencies found in these guidelines include:

- An understanding of hazardous materials terms, basic hazard and risk assessment, and the role of the Firefighter at a hazardous materials incident.
- The ability to detect an incident and to take appropriate actions to keep both the Awareness trained person and others safe.
- Make appropriate notification with usable and critical information.

Refresher Training

Refresher training is recommended to occur annually.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**

Guidelines for Operations Level Training

(includes mission specific training guidelines)

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

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Guidelines for Operations Level Training

Introduction

The operations level responder shall first be trained to the Awareness Level then be trained to the requirements of the Operational level as defined in OSHA 29 CFR 1910.120, Hazardous Materials Waste Operations and Emergency Response, and NFPA 472, Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 edition.

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who encounter or respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illness, and disabilities to those who accidently or intentionally encounter an incident.

It shall not be the intention of these guidelines to restrict any organization/jurisdiction from exceeding these minimum requirements.

Definition of Hazardous Materials Operations Trained Personnel

Persons who respond to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

In addition, Operations Trained Personnel are required to have:

- Knowledge of the basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment provided to the first responder operational level.
- An understanding of basic hazardous materials terms.
- Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
- Know how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

Goal

The goal of these training guidelines is to make available a format for operations level responder training. Following these guidelines will highlight the knowledge and skills to perform the defined core competencies safely.

Tasks

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

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Hazardous Materials Operations training is recommended to take place in a traditional classroom setting. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and shall include any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, exercises, and a field activity that will include working within an incident command structure.

The individual delivering training should possess technical experience in the subject matter being taught and be well versed in adult instructional techniques.

Acronyms

AFFF – Aqueous Film-forming Foam

AHJ – Authority Having Jurisdiction

APR – Air Purifying Respirator

CHEMTREC – Chemical Transportation Emergency Center

CANUTEC – Canadian Transport Emergency Center

DOT – Department of Transportation

EOD – Explosive Ordinance Disposal

FBI – Federal Bureau of Investigation

HME – Homemade Explosive

ICS – Incident Command System

IED – Improvised Explosive Devices

MC – Motor Carrier

MSDS – Materials Safety Data Sheet (now Safety Data Sheet)

NBSCAB – National Bomb Squad Commander Advisory Board

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Association

PAPR – Powered Air Purifying Respirator

PCP – Pest Control Product

PPE – Personal Protective Equipment

SCBA – Self Contained Breathing Apparatus

SDS – Safety Data Sheet

SETIQ – Sistema de Emergencia para la Transportacion de la Industria Quimca (Transportation for Chemical Industry, Mexico)

UN/NA – United Nations/North America

UN/DOT – United Nations/Department of Transportation

VOC – Volatile Organic Compounds

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of operations level personnel.

OPS 1 Analyzing the Incident.

OPS 1.1 Surveying Hazardous Materials/WMD Incidents

Given scenarios involving hazardous materials/WMD incidents collect information about the incident to identify the containers, the materials involved, the surrounding conditions, and whether hazardous materials/WMD have been released.

OPS 1.1.1 Given three examples each of liquid, gas, and solid hazardous material or WMD, including various hazard classes identify the general shapes of containers in which the hazardous materials/WMD are typically found.

1. Given examples of the following tank cars identify each tank car by type, as follows:
    a. Cryogenic liquid tank cars
    b. Non-pressure tank cars (general service or low pressure cars)
2. Given examples of the following intermodal tanks identify each intermodal tank by type, as follows:
    a. Non-pressure intermodal tanks
    b. Pressure intermodal tanks
    c. Specialized intermodal tanks, including Cryogenic intermodal tanks and Tube modules
3. Given examples of the following cargo tanks identify each cargo tank by type, as follows:
    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 chemical tanks
    g. Non-pressure liquid tanks
4. Given examples of the following storage tanks identify each tank by type, as follows:
    a. Cryogenic liquid tank
    b. Non-pressure tank
    c. Pressure tank
5. Given examples of the following non-bulk packaging identify each package by type, as follows:

a. Bags

b. Carboys

c. Cylinders

d. Drums

e. Dewar flask (cryogenic liquids)

6. Given examples of the following packaging identify the characteristics of each Intermediate bulk container (IBC) and ton container.

7. Given examples of the following radioactive material packages identify the characteristics of each container or package by type, as follows:

   a. Excepted

   b. Industrial

   c. Type A

   d. Type B

   e. Type C

OPS 1.1.2 Given examples of containers identify the markings that differentiate one container from another.

1. Given examples of the following marked transport vehicles and their corresponding shipping papers identify the following vehicle or tank identification marking:

   a. Highway transport vehicles, including cargo tanks

   b. Intermodal equipment, including tank containers

   c. Rail transport vehicles, including tank cars

2. Given examples of facility containers identify the markings indicating container size, product contained, and/or site identification numbers.

OPS 1.1.3 Given examples of hazardous materials incidents identify the name(s) of the hazardous material(s).

1. Identify the following information on a pipeline marker:

   a. Emergency telephone number

   b. Owner

   c. Product

2. Given a pesticide label identify each of the following pieces of information, then match the piece of information to its significance in surveying hazardous materials incidents:

   a. Active ingredient

   b. Hazard statement

   c. Name of pesticide

d. Pest control product (PCP) number (in Canada)

e. Precautionary statement

f. Signal word

3. Given a label for a radioactive material identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable.

OPS 1.1.4 Identify and list the surrounding conditions that should be noted when a hazardous materials/WMD incident is surveyed.

OPS 1.1.5 Describe ways to verify information obtained from the survey of a hazardous materials/WMD incident.

OPS 1.1.6 Identify at least three additional hazards that could be associated with an incident involving terrorist or criminal activities.

OPS 1.2 Collecting Hazard and Response Information

OPS 1.2.1 Given scenarios involving known hazardous materials/WMD collect hazard and response information using SDS, CHEMTREC/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 a SDS in an emergency
3. Using an SDS 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

OPS 1.3 Predicting the Likely Behavior of a Material and Its Container

OPS 1.3.1 Given scenarios involving hazardous materials/WMD incidents, each with a single hazardous material/WMD 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 range
      v. Flash point
      vi. Particle size
      vii. Persistence
      viii. Physical state
      ix. Specific gravity
      x. Toxic products of combustion
      xi. Vapor density
      xii. Vapor pressure
      xiii. Water solubility
      xiv. (Auto) Ignition temperature
      xv. Radiation (ionizing and non-ionizing)
   b. Identify the differences between the following terms:
      i. Contamination & secondary contamination

ii. Exposure & contamination

iii. Exposure & hazard

iv. Infectious & contagious

v. Acute effects & chronic effects

vi. Acute & 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. Toxic
   i. Sensitizer, allergen
   j. Target organ effects
9. Given the following, identify the corresponding UN/DOT hazard class and division:
   a. Blood agents
   b. Choking agents
   c. Irritants (riot control agents)
   d. Nerve agents
   e. Radiological materials
   f. Vesicants (blister agents)
   g. Biological agents and biological toxins

OPS 1.4 Estimating Potential Harm

OPS 1.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 2 Planning the Response

OPS 2.1 Describing Response Objectives

OPS 2.1.1 Given at least two scenarios involving hazardous materials/WMD incidents 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 protected with 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

OPS 2.2 Identifying Action Options

OPS 2.2.1 Given examples of hazardous materials/WMD incidents (facility and transportation 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

OPS 2.3 Determining Suitability of Personal Protective Equipment

OPS 2.3.1 Given examples of hazardous materials/WMD incidents, including the names of the hazardous materials/WMD involved and the anticipated type of exposure 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

OPS 2.4 Identifying Decontamination Issues

OPS 2.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 3 Implementing the Planned Response

OPS 3.1 Establishing Scene Control

OPS 3.1.1 Given two scenarios involving hazardous materials/WMD incidents explain how to establish and maintain scene control, including control zones and emergency decontamination, 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 either a Hazardous material incidents or a Hazardous materials/WMD incidents involving criminal activities
6. Identify the procedures for ensuring coordinated communication between responders and to the public

OPS 3.2 Preserving Evidence

OPS 3.2.1 Given two scenarios involving hazardous materials/WMD incidents describe the process to preserve evidence as listed in the emergency response plan and/or standard operating procedures.

OPS 3.3 Initiating the Incident Command System.

OPS 3.3.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 3.4 Using Personal Protective Equipment

OPS 3.4.1 Given the personal protective equipment provided by the AHJ 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

OPS 4 Evaluating Progress

OPS 4.1 Evaluating the Status of Planned Response

OPS 4.1.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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

OPS 4.2 Communicating the Status of Planned Response

OPS 4.2.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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.

Training Guidelines for Operations Level Responders Assigned Mission-Specific Responsibilities

Introduction

This section identifies training guidelines for operations level responders assigned mission-specific responsibilities at hazardous materials/WMD incidents by the AHJ beyond the core competencies at the operations level. These include Operational level responders assigned to:

1. Use personal protective equipment
2. Perform mass decontamination
3. Perform technical decontamination
4. Perform evidence preservation and sampling
5. Perform product control
6. Perform air monitoring and sampling
7. Perform victim rescue/recovery
8. Respond to illicit laboratory incidents
9. Perform disablement/disruption of improvised explosives devices (IED), improvised WMD dispersal devices, and operations at improvised explosive laboratories.

Training Requirements

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, all core competencies at the operations, and all competencies for the assigned responsibilities in the applicable section(s) in this chapter.

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.

Goal

The goal of these training guidelines is 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.

Mandating of Competencies

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.

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 training shall be as set out in this chapter.

Mission Specific Training Personal Protective Equipment

Introduction

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.

Training Requirements

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, all core competencies at the operations level, and all competencies in this section.

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

Goal

The goal of training is 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

PPE MS 1 Planning the Response

PPE MS 1.1 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, 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:

PPE MS 1.1.1 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

PPE MS 1.1.2 Describe personal protective equipment options for the following hazards:

1. Thermal
2. Chemical
3. Radiological
4. Etiological/biological
5. Asphyxiating
6. Mechanical

PPE MS 1.1.3 Select personal protective equipment for mission-specific tasks at hazardous materials/WMD incidents based on local procedures

1. Describe the impact and significance of Degradation, Penetration, and Permeation chemical-protective clothing:
2. Identify at least three indications of material degradation of chemical-protective clothing
3. Identify the different designs of vapor-protective and splash-protective clothing and describe the advantages and disadvantages of each type
4. Identify the relative advantages and disadvantages of the following heat exchange units used for the cooling of personnel operating in personal protective equipment:
    a. Air cooled
    b. Ice cooled
    c. Water cooled
    d. Phase change cooling technology
5. Identify the physiological and psychological stresses that can affect users of personal protective equipment
6. Describe local procedures for going through the technical decontamination process

PPE MS 2 Implementing the Planned Response

PPE MS 2.1 Using Protective Clothing and Respiratory Protection

Given the personal protective equipment provided by the AHJ, 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

PPE MS 3 Terminating the Incident

PPE MS 3.1 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.

Mission Specific Training Mass Decontamination

Introduction

The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall be that person, assigned to implement mass decontamination operations at hazardous materials/WMD incidents.

Training Requirements

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, and all competencies in this section.

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.

Goal

The goal of training is 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 safely and effectively. These tasks include:

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

MASS DECON 1 Planning the Response

MASS DECON 1.1 Selecting Personal Protective Equipment

Given an emergency response plan or standard operating procedures and the personal protective equipment provided by the AHJ, select the personal protective equipment required to support mass decontamination at hazardous materials/WMD incidents based on local procedures.

MASS DECON 1.2 Selecting Decontamination Procedures

Given scenarios involving hazardous materials/WMD incidents, 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:

MASS DECON 1.2.1 Identify the advantages and limitations of mass decontamination operations

MASS DECON 1.2.2 Describe the advantages and limitations of each of the following mass decontamination methods:

1. Dilution
2. Isolation
3. Washing

MASS DECON 1.2.3 Identify sources of information for determining the correct mass decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident

MASS DECON 1.2.4 Given resources provided by the AHJ, identify the supplies and equipment required to set up and implement mass decontamination operations

MASS DECON 1.2.5 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

MASS DECON 2 Implementing the Planned Response

MASS DECON 2.1 Performing Incident Management Duties

Given a scenario involving a hazardous materials/WMD incident and the emergency response plan or standard operating procedures, 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.

MASS DECON 2.2 Performing Decontamination Operations Identified in Incident Action Plan

Demonstrate the ability to set up and implement mass decontamination operations for ambulatory and non-ambulatory victims.

MASS DECON 3 Evaluating Progress

MASS DECON 3.1 Evaluating the Effectiveness of the Mass Decontamination Process

Given examples of contaminated items that have undergone the required decontamination, 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.

MASS DECON 4 Terminating the Incident

MASS DECON 4.1 Reporting and Documenting the Incident

Given a scenario involving a hazardous materials/WMD incident, 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

Mission Specific Training Technical Decontamination

Introduction

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.

Training Requirements

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, and all competencies in this guideline.

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.

Goal

The goal of training is 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 safely and effectively. These tasks include:

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

TECH DECON 1 Planning the Response

TECH DECON 1.1 Selecting Personal Protective Equipment

Given an emergency response plan or standard operating procedures and the personal protective equipment provided by the AHJ, select the personal protective equipment required to support technical

decontamination at hazardous materials/WMD incidents based on local procedures.

TECH DECON 1.2 Selecting Decontamination Procedures

Given scenarios involving hazardous materials/WMD incidents 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:

TECH DECON 1.2.1 Identify the advantages and limitations of technical decontamination operations

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

TECH DECON 2 Implementing the Planned Response

TECH DECON 2.1 Performing Incident Management Duties

Given a scenario involving a hazardous materials/WMD incident and the emergency response plan or standard operating procedures, demonstrate the technical decontamination duties assigned in the incident action plan by completing the following requirements:

TECH DECON 2.1.1 Identify the role of the operations level responder assigned to technical decontamination operations during hazardous materials/WMD incidents

TECH DECON 2.1.2 Describe the procedures for implementing technical decontamination operations within the incident command system

TECH DECON 2.2 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:

TECH DECON 2.2.1 Technical decontamination operations in support of entry operations

TECH DECON 2.2.2 Technical decontamination operations for ambulatory and non-ambulatory victims

TECH DECON 3 Evaluating Progress

TECH DECON 3.1 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.

TECH DECON 4 Terminating the Incident

TECH DECON 4.1 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

Mission Specific Training Evidence Preservation and Sampling

Introduction

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.

Training Requirements

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, and all competencies in this guideline.

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.

Goal

The goal of the training is 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 safely and effectively.\

Tasks

When responding to Hazardous Materials/WMD incidents, the operation 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 authority 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

EVI PRE 1 Analyzing the Incident

EVI PRE 1.1 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, describe the potential criminal violation and identify the law enforcement agency having investigative jurisdiction by completing the following requirements:

EVI PRE 1.1.1 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:

1. Suspicious letter
2. Suspicious package
3. Illicit laboratory
4. Release/attack with a WMD agent
5. Environmental crimes

EVI PRE 1.1.2 Given examples of the following hazardous materials/WMD incidents, the operations level responder shall identify the agency with investigative authority and the incident response considerations associated with each situation:

1. Suspicious letter
2. Suspicious package
3. Environmental crimes
4. Release/attack with a WMD agent
5. Hazardous materials/WMD illicit laboratory

EVI PRE 2 Planning the Response

EVI PRE 2.1 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:

EVI PRE 2.1.1 Given an incident involving illicit laboratories, a hazardous materials/WMD incident, or an environmental crime, perform the following tasks:

1. Describe the procedure for securing the scene and characterizing and preserving evidence at the scene
2. Describe the procedure to document personnel and scene activities associated with the incident
3. Describe the procedure to determine whether the operations level responders are within their legal authority to perform evidence preservation and sampling tasks
4. Describe the procedure to notify the agency with investigative authority
5. Describe the procedure to notify the explosive ordnance disposal (EOD) personnel
6. Identify potential sample/evidence
7. Identify the applicable sampling equipment
8. Describe the procedures to protect samples and evidence from secondary contamination
9. Describe documentation procedures
10. Describe evidentiary sampling techniques
11. Describe field screening protocols for collected samples and evidence
12. Describe evidence labeling and packaging procedures
13. Describe evidence decontamination procedures
14. Describe evidence packaging procedures for evidence transportation
15. Describe chain-of-custody procedures

EVI PRE 2.1.2 Given an example of an illicit laboratory, perform the following tasks:

1. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
2. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
3. Describe the sampling options associated with liquid and solid sample and evidence collection
4. Describe the field screening protocols for collected samples and evidence

EVI PRE 2.1.3 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:

1. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
2. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
3. Describe the sampling options associated with the collection of liquid and solid samples and evidence
4. Describe the field screening protocols for collected samples and evidence

EVI PRE 2.1.4 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:

1. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
2. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
3. Describe the sampling options associated with the collection of liquid and solid samples and evidence
4. Describe the field screening protocols for collected samples and evidence

EVI PRE 2.1.5 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:

1. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident
2. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
3. Describe the sampling options associated with liquid and solid sample/evidence collection
4. Describe the field screening protocols for collected samples and evidence

EVI PRE 2.1.6 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:

1. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident

2. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers
3. Describe the sampling options associated with the collection of liquid and solid samples and evidence
4. Describe the field screening protocols for collected samples and evidence

EVI PRE 2.1.7 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:

1. Corrosivity
2. Flammability
3. Oxidation
4. Radioactivity
5. Volatile organic compounds (VOC)

EVI PRE 2.1.8 Describe the potential adverse impact of using destructive field screening techniques

EVI PRE 2.1.9 Describe the procedures for maintaining the evidentiary integrity of any item removed from the crime scene

EVI PRE 2.2 Selecting Personal Protective Equipment

Given the personal protective equipment provided by the AHJ, select the personal protective equipment required to support evidence preservation and sampling at hazardous materials/WMD incidents based on local procedures.

EVI PRE 3 Implementing the Planned Response

EVI PRE 3.1 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
16. Describe local procedures for the technical decontamination process.

Mission Specific Training Product Control

Introduction

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.

Training Requirements

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, all competencies within air monitoring and sampling, and all competencies in this section.

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.

Goal

The goal of these training guidelines is to provide the operations level responder assigned to product control at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks safely and effectively.

Tasks

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

PROD 1 Planning the Response

PROD 1.1 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:

PROD 1.1.1 Identify the options to accomplish a given response objective

PROD 1.1.2 Identify the purpose for and the procedures, equipment, and safety precautions associated with each of the following control techniques:

1. Absorption
2. Adsorption
3. Damming
4. Diking
5. Dilution
6. Diversion
7. Remote valve shutoff
8. Retention
9. Vapor dispersion
10. Vapor suppression

PROD 1.2 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.

PROD 2 Implementing the Planned Response

PROD 2.1 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:

PROD 2.1.1 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

PROD 2.1.2 Identify the characteristics and applicability of the following Class B foams if supplied by the AHJ:

1. Aqueous film-forming foam (AFFF)
2. Alcohol-resistant concentrates
3. Fluoroprotein
4. High-expansion foam

PROD 2.1.3 Given the required tools and equipment, demonstrate how to perform the following control activities:

1. Absorption
2. Adsorption
3. Damming
4. Diking
5. Dilution
6. Diversion
7. Remote valve shutoff
8. Retention
9. Vapor dispersion
10. Vapor suppression

PROD 2.1.4 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

PROD 2.1.5 Describe the use of emergency remote shutoff devices at fixed facilities

PROD 2.2 Describe local procedures for going through the technical decontamination process.

Mission Specific Training Air Monitoring and Sampling

Introduction

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.

Training Requirements

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, and all competencies in this section.

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.

Goal

The goal of this training guideline is 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 safely and effectively.

Tasks

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

AIR MON 1 Planning the Response

AIR MON 1.1 Given the air monitoring and sampling equipment provided by the AHJ, select the detection or monitoring equipment suitable for detecting or monitoring solid, liquid, or gaseous hazardous materials/WMD.

AIR MON 1.2 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.

AIR MON 1.3 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.

AIR MON 2 Implementing the Planned Response.

AIR MON 2.1 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.

AIR MON 2.2 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.

Mission Specific Training Victim Rescue and Recovery

Introduction

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.

Training Requirements

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, all competencies within air monitoring and sampling, and all competencies in this section.

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.

Goal

The goal of these training guidelines is 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 safely and effectively.

Tasks

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

VIC RES 1 **Planning the Response**

VIC RES 1.1 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:

VIC RES 1.1.1 Determine the feasibility of conducting rescue and recovery operations

VIC RES 1.1.2 Describe the safety procedures, tactical guidelines, and incident response considerations to effect a rescue associated with each of the following situations:

1. Line-of-sight with ambulatory victims
2. Line-of-sight with non-ambulatory victims
3. Non-line-of-sight with ambulatory victims
4. Non-line-of-sight with non-ambulatory victims
5. Victim rescue operations versus victim recovery operations

VIC RES 1.1.3 Determine if the options are within the capabilities of available personnel and personal protective equipment

VIC RES 1.1.4 Describe the procedures for implementing victim rescue and recovery operations within the incident command system

VIC RES 1.2 **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.

VIC RES 2 **Implementing the Planned Response**

VIC RES 2.1 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

Mission Specific Training Response to Illicit Laboratory Incidents

Introduction

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.

Training Requirements

The operations level responder who responds to illicit laboratory incidents shall be trained to meet all competencies at the awareness level, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, all competencies within air monitoring and sampling, and all competencies in this section.

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

Goal

The goal of these training guidelines is to provide the operations level responder assigned to respond to illicit laboratory incidents with the knowledge and skills to perform the tasks safely and effectively.

Tasks

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

LAB 1 Analyzing the Incident

LAB 1.1 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

LAB 2 Planning the Response

LAB 2.1 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.

LAB 2.2 Identifying Unique Aspects of Criminal Hazardous Materials/WMD Incidents

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.
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:
    a. Law enforcement securing and preserving the scene
    b. Joint hazardous materials and EOD personnel site reconnaissance and hazard identification
    c. Determining atmospheric hazards through air monitoring and detection
    d. Mitigation of immediate hazards while preserving evidence

e. Coordinated crime scene operation with the law enforcement agency having investigative authority

f. Documenting personnel and scene activities associated with incident

LAB 2.2.3 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:

LAB 2.2.3.1 Given scenarios involving illicit drug manufacturing or illicit WMD manufacturing, identify the law enforcement agency with investigative authority for the following situations:

1. Illicit drug manufacturing
2. Illicit WMD manufacturing
3. Environmental crimes resulting from illicit laboratory operations

LAB 2.2.4 Identifying Unique Tasks and Operations at Sites Involving Illicit Laboratories

LAB 2.2.4.1 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.

LAB 2.2.4.2 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

LAB 2.2.5 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.

LAB 3 Implementing the Planned Response

LAB 3.1 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.

LAB 3.2 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:

LAB 3.2.1 Describe safe and effective methods for law enforcement to secure the scene

LAB 3.2.2 Demonstrate decontamination procedures for tactical law enforcement personnel (SWAT or K-9) securing an illicit laboratory

LAB 3.2.3 Describe methods to identify and avoid potential unique safety hazards found at illicit laboratories such as booby traps and releases of hazardous materials

LAB 3.2.4 Describe methods to conduct joint hazardous materials/EOD operations to identify safety hazards and implement control procedures

LAB 3.3 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:

LAB 3.3.1 Potential manufacture of illicit drugs

LAB 3.3.2 Potential manufacture of illicit WMD materials

LAB 3.3.3 Potential environmental crimes associated with the manufacture of illicit drugs/WMD materials

LAB 3.4 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.

LAB 3.4.1 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.

LAB 3.4.2 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.

Mission Specific Training Disablement/Disruption of Improvised Explosives Devices (IEDs), Improvised WMD Dispersal Devices, and Operations at Improvised Explosives Laboratories

Introduction

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.

Training Requirements

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.

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, mission-specific competencies for response to illicit laboratories, and all competencies in this section.

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.

EOC Teams are encouraged to coordinate an integrated response effort with a regional Type I Hazardous Materials WMD/CBRNE Response Team for deployment of specialized chemical/biological detection technologies in support of their overall mission.

Goal

The goal of these training guidelines is 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 safely and effectively.

Tasks

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:

    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

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

IED 1 Analyzing the Incident

IED 1.1 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:

IED 1.2 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:

1. Letter/package-based improvised dispersal device
2. Briefcase/backpack-based improvised dispersal device
3. Transportation-borne WMD dispersal device
4. Fixed location hazards where an IED has been placed to cause the deliberate release of a material

IED 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:

IED 2.1 Given examples of improvised explosives manufacturing methods, describe the operational considerations, hazards, and products involved in the process

IED 2.2 Given examples of improvised explosives laboratory operations, describe the potential booby traps that have been encountered by response personnel

IED 2.3 Given examples of improvised explosives laboratory operations, describe the agencies that have investigative authority and operational responsibility to support the response

IED 3 Planning the Response.

IED 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:

IED 3.1.1 Given an incident involving a nonvehicle based WMD dispersal device, shall be able to perform the following tasks:

1. Describe the hazards, safety procedures, and tactical guidelines for this type of incident
2. Describe the factors to be evaluated in selecting the personal protective equipment
3. Describe the procedure for identifying and obtaining the appropriate emergency response elements to support disablement/disruption activities

IED 3.1.2 Given an incident involving a vehicle-borne WMD dispersal device, shall be able to perform the following tasks:

1. Describe the hazards, safety procedures, and tactical guidelines for this type of incident
2. Describe the factors to be evaluated in selecting the personal protective equipment
3. Describe the procedure for identifying and obtaining the appropriate emergency response elements to support disablement/disruption activities

IED 3.1.3 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:

1. Gamma and neutron radiation
2. Explosive materials [commercial and homemade explosives (HME)]

IED 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:

IED 3.2.1 Given a scenario involving an improvised explosive laboratory and detection devices provided by the AHJ, complete the following:

1. Describe the hazards, safety procedures, and tactical guidelines for this type of incident

2. Describe the factors to be evaluated in selecting the personal protective equipment
3. 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. Radioactive materials that emit alpha, beta, gamma, or neutron radiation, including radionuclide identification of gamma emitting radioactive materials
    b. Explosive materials (commercial and HME)
4. Demonstrate the field test and operation of each detection device and interpret the readings based on local procedures
5. Describe local procedures for decontamination of themselves and their detection devices upon completion of the material detection mission
6. Describe the procedure for identifying and obtaining the appropriate emergency response elements to support disablement/disruption or mitigation activities

IED 3.3 Identifying Potential Response Options

IED 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.

IED 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.

IED 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).

IED 4 Implementing the Planned Response

IED 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:

IED 4.1.1 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

IED 4.1.2 Perform diagnostics based on procedures instructed by a nationally accredited hazardous devices school or program

IED 4.1.3 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

IED 4.1.4 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

IED 4.1.5 Given the air monitoring and sampling equipment provided by the AHJ, shall complete the following:

1. Select the detection or monitoring equipment suitable for detecting or monitoring of the IED or improvised WMD dispersal device
2. Describe the operation, capabilities, limitations, local monitoring procedures, field-testing, and maintenance procedures associated with each device provided by the AHJ
3. Describe local procedures for decontamination of the detection and monitoring devices upon completion of the mission

IED 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:

IED 4.2.1 Describe the safe and effective methods for law enforcement to secure the scene

IED 4.2.2 Demonstrate methods to identify and avoid unique safety hazards at improvised explosives laboratories such as booby traps, releases of hazardous materials, and initiating components

IED 4.2.3 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

IED 4.2.4 Describe the methods that could be utilized to mitigate the hazards identified

IED 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.

IED 4.3.1 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.

Summary: Operations Training Guidelines

Audience

These guidelines were developed for persons who respond to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

Prerequisites

Awareness level training is required prior to the completion of the Operations level.

Training

Operations Level training is recommended to take place in a traditional classroom setting and include opportunities for field study and application. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, large and small exercise groups, and a field activity that will include working within an incident command structure.

Mission Specific Training

The operations level responder assigned to perform mission specific functions at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level, all core competencies at the operations level, and all mission-specific competencies.

The operations level responder assigned to perform mission specific functions at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

Competencies

The competencies found in these guidelines include:

- An understanding of hazardous materials terms, basic hazard and risk assessment, and the role of the Firefighter at a hazardous materials incident.
- The ability to perform basic control. Containment and/or confinement techniques with proper use of personal protective equipment and following standard operating procedures.
- The ability to implement basic decontamination procedures.

Refresher Training

Refresher training is recommended to occur on an annual basis.

Florida

EMERGENCY RESPONSE COMMISSION

for Hazardous Materials

Guidelines for Technician Level Training

(includes Specialist training guidelines)

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

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Guidelines for Hazardous Materials Technicians Training

Introduction

The technician level responder shall first be trained to the Operations Level then be trained to the requirements of the Technician level as defined in OSHA 29 CFR 1910.120, Hazardous Materials Waste Operations and Emergency Response, and NFPA 472, Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 edition.

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illness, and disabilities to those who accidently or intentionally encounter an incident.

It shall not be the intention of these guidelines to restrict any organization/jurisdiction from exceeding these minimum requirements.

Definition of Hazardous Materials Technicians Trained Personnel

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

In addition, Operations Trained Personnel are required to have:

- Knowledge of the basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment provided to the first responder operational level.
- An understanding of basic hazardous materials terms.
- Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
- Know how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

Goal

The goal of these training guidelines is to make available a format for operations level responder training. Following these guidelines will provide knowledge and skills to perform the defined core competencies safely.

Technician Level Tasks

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

    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 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

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Hazardous Materials Technician training is recommended to take place in a classroom/field live practice setting. Technician training is very comprehensive including both knowledge based skills and technical hands-on training. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and shall include any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, exercises, and a field activity that will include working within an incident command structure.

The individual delivering training should possess technical experience in the subject matter being taught and be well versed in adult instructional techniques.

Acronyms

AFFF – Aqueous Film-forming Foam

AHJ – Authority Having Jurisdiction

APR – Air Purifying Respirator

CHEMTREC – Chemical Transportation Emergency Center

CANUTEC – Canadian Transport Emergency Center

DOT – Department of Transportation

EOD – Explosive Ordinance Disposal

FBI – Federal Bureau of Investigation

HME – Homemade Explosive

ICS – Incident Command System

IED – Improvised Explosive Devices

MC – Motor Carrier

MSDS – Materials Safety Data Sheet (now Safety Data Sheets)

NBSCAB – National Bomb Squad Commander Advisory Board

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Association

PAPR – Powered Air Purifying Respirator

PCP – Pest Control Product

PPE – Personal Protective Equipment

SCBA – Self Contained Breathing Apparatus

SDS – Safety Data Sheets

SETIQ – Sistema de Emergencia para la Transportacion de la Industria Quimca (Transportation for Chemical Industry, Mexico)

UN/NA – United Nations/North America

UN/DOT – United Nations/Department of Transportation

VOC – Volatile Organic Compounds

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of technician level personnel.

HM TECH 1 Analyzing the Incident

HM TECH 1.1 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.

HM TECH 1.1.1 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.

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

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

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

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

Given examples of the following ***nonbulk 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

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

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

HM TECH 1.1.2 Given examples of three facility and three transportation containers, the hazardous materials technician shall identify the approximate capacity of each container.

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

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

HM TECH 1.1.3 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.

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

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

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

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

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

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.

HM TECH 1.1.4 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.

HM TECH 1.1.5 The hazardous materials technician shall demonstrate methods for collecting samples of the following:

1. Gas
2. Liquid
3. Solid

HM TECH 1.2 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.

HM TECH 1.2.1 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

HM TECH 1.2.2 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. 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

HM TECH 1.2.3 The hazardous materials technician shall describe the heat transfer processes that occur as a result of a cryogenic liquid spill.

HM TECH 1.2.4 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.

HM TECH 1.2.5 The hazardous materials technician shall identify two methods for determining the pressure in bulk packaging or facility containers.

HM TECH 1.2.6 The hazardous materials technician shall identify one method for determining the amount of lading remaining in damaged bulk packaging or facility containers.

HM TECH 1.3 Describing the Condition of the Container Involved in the Incident

Given examples of container damage, the hazardous materials technician shall describe the damage.

HM TECH 1.3.1 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.

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

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

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
2. Type C

HM TECH 1.3.2 The hazardous materials technician shall describe how a liquid petroleum product pipeline can carry different products.

HM TECH 1.3.3 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

HM TECH 1.3.4 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.

HM TECH 1.3.5 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.

HM TECH 1.4 **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.

HM TECH 1.4.1 The hazardous materials technician shall identify at least three resources available that indicate the effects of mixing various hazardous materials.

HM TECH 1.4.2 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

HM TECH 1.4.3 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

HM TECH 1.5 **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.

HM TECH 1.5.1 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.

HM TECH 1.5.2 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.

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 (LC50)
6. Lethal dose (LD50)
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 (TLV-STEL)
14. Threshold limit value time-weighted average (TLV-TWA)

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.

HM TECH 1.5.3 The hazardous materials technician shall identify the steps for estimating the outcomes within an endangered area of a hazardous materials/WMD incident.

HM TECH 1.5.4 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.

HM TECH 2 Planning the Response

HM TECH 2.1 Identifying Response Objectives

HM TECH 2.1.1 Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall describe the response objectives for each problem.

HM TECH 2.1.2 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).

HM TECH 2.2 Identifying the Potential Response Options

HM TECH 2.2.1 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.

HM TECH 2.2.2 The hazardous materials technician shall be able to identify the possible response options to accomplish a given response objective.

HM TECH 2.3 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.

HM TECH 2.3.1 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.

HM TECH 2.3.2 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)

HM TECH 2.3.3 The hazardous materials technician shall identify the process to be considered in selecting respiratory protection for a specified action option.

HM TECH 2.3.4 The hazardous materials technician shall identify the factors to be considered in selecting chemical-protective clothing for a specified action option.

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

a. Degradation

b. Penetration

c. Permeation

2. The hazardous materials technician shall identify at least three indications of material degradation of chemical-protective clothing.
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.
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:

   a. Air cooled

   b. Ice cooled

   c. Water cooled

   d. Phase change cooling technology

5. The hazardous materials technician shall identify the process for selecting protective clothing at hazardous materials/WMD incidents.
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. The hazardous materials technician shall identify the physiological and psychological stresses that can affect users of personal protective equipment.
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.

HM TECH 2.4 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

HM TECH 2.5 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.

HM TECH 2.5.1 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. Over packing
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)

HM TECH 2.5.2 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.

1. The hazardous materials technician shall list and describe the safety considerations to be included.
2. The hazardous materials technician shall identify the points that should be made in a safety briefing prior to working at the scene.
3. The hazardous materials technician shall identify the atmospheric and physical safety hazards associated with hazardous materials/WMD incidents involving confined spaces.
4. The hazardous materials technician shall identify the pre-entry activities to be performed.
5. The hazardous materials technician shall identify the procedures, equipment, and safety precautions for preserving and collecting legal evidence at hazardous materials /WMD incidents.

HM TECH 3 Implementing the Planned Response

HM TECH 3.1 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.

HM TECH 3.1.1 Describe the duties of an assigned function in the hazardous materials branch or group within the incident command system.

HM TECH 3.1.3 Identify the role of the hazardous materials technician during hazardous materials/WMD incidents.

HM TECH 3.2 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

HM TECH 3.3 **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 over-pack drum, demonstrate the ability to place the 55 gal (208 L) drum into the over-pack 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

HM TECH 3.4 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.

HM TECH 3.5 **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

HM TECH 4 **Evaluating Progress**

HM TECH 4.1 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.

HM TECH 4.2 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.

HM TECH 5 Terminating the Incident

HM TECH 5.1 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

HM TECH 5.2 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

HM TECH 5.3 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

Training Guidelines for Hazardous Materials Technicians with a Tank Car Specialty

Introduction

The hazardous materials technician with a tank car specialty shall be that person who provides technical support pertaining to tank cars, provides oversight for product removal and movement of damaged tank cars, and acts as a liaison between technicians and outside resources.

Training Requirements

The hazardous materials technician with a tank car specialty shall be trained at the technician level and meet all of the competencies of this section.

Hazardous materials technicians with a tank car specialty shall also receive training to meet governmental response and occupational health and safety regulations.

Goal

The goal of these training guidelines is to provide the hazardous materials technician with a tank car specialty with a minimum set of knowledge and skills to perform the tasks safely.

Tasks

When responding to hazardous materials/WMD incidents, the hazardous materials technician with a tank car specialty shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident involving tank cars to determine the complexity of the problem and potential outcomes by completing the following tasks:
    a. Determine the type and extent of damage to tank cars
    b. Predict the likely behavior of tank cars and their contents in an emergency
2. Plan a response to an emergency involving tank cars within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by determining the response options (offensive, defensive, and nonintervention) for a hazardous materials/WMD incident involving tank cars
3. Implement or oversee the implementation of the planned response to a hazardous materials/WMD incident involving tank cars

Mandating of Competencies

These guidelines shall not mandate that hazardous materials response teams performing offensive operations on tank cars have technicians with a tank car specialty. Hazardous materials technicians operating within the bounds of their training shall be able to intervene in railroad incidents.

If a hazardous materials response team decides to train some or all its technicians to have in depth knowledge of tank cars, this chapter shall set out the required competencies.

TECH TC 1 Analyzing the Incident

TECH TC 1.1 Determining the Type and Extent of Damage to Tank Cars

Given examples of damaged tank cars, technicians with a tank car specialty shall describe the type and extent of damage to each tank car and its fittings and shall complete the following tasks:

1. Given the specification mark for a tank car and the reference materials, describe the car's basic construction and features
2. Point out the “B” end of the car
3. Given examples of various tank cars, identify and describe the design and purpose of each of the following tank car components, when present:
    a. Body bolster
    b. Head shield
    c. Heater coils
    d. Jacket
    e. Lining and cladding
    f. Shelf couplers
    g. Tank
    h. Trucks (pin and bowl)
    i. Underframe — continuous or stub sill
4. Given examples of tank cars (jacketed and not jacketed), identify the jacketed tank cars
5. Describe the difference between insulation and thermal protection on tank cars
6. Describe the difference between jacketed and sprayed-on thermal protection on tank cars
7. Describe the difference between interior and exterior heater coils on tank cars
8. Given examples of various fittings arrangements for pressure, non-pressure, cryogenic, and carbon dioxide tank cars (including examples of each of the following fittings), identify and describe the design, construction, and operation of each of the following fittings, when present:
    a. Fittings for loading and unloading tank cars, including the following:
        i. Air value
        ii. Bottom outlet nozzle
        iii. Bottom outlet valves (top operated with stuffing box, bottom operated — internal or external ball, wafersphere, plug)

iv. Quick-fill hole cover

v. Carbon dioxide tank car fittings

vi. Cryogenic liquid tank car fittings

vii. Excess flow valve

viii. Flange for manway, valves, and so forth

ix. Liquid valve and vapor valve (ball versus plug type)

b. Fittings for pressure relief, including the following:

i. Pressure regulators on carbon dioxide cars and liquefied atmospheric gases in cryogenic liquid tank cars

ii. Pressure relief devices (pressure relief valve, safety vent, combination pressure relief valve)

iii. Staged pressure relief system for a carbon dioxide car

iv. Vacuum relief valve (negative pressure or vacuum)

v. Breather vent (continuous vent)

c. Fittings for gauging, including the following:

i. Closed gauging devices (e.g., magnetic)

ii. Open gauging devices (e.g., slip tube)

iii. Other gauging devices (T-bar, long pole, short pole)

d. Miscellaneous fittings, including the following:

i. Manway, manway cover plate, hinged and bolted manway cover, protective housing

ii. Sample line

iii. Sump

iv. Thermometer well

v. Washout

vi. GPS transponders

9. Given examples of various fitting arrangements on tank cars (including carbon dioxide and cryogenic liquid tank cars) with the following fittings included, identify the location(s) where each fitting is likely to leak and a reason for the leak:

a. Air valve

b. Bottom outlet nozzle

c. Bottom outlet valve and top operated bottom outlet valve (with stuffing box)

d. Closed gauging devices (e.g., magnetic)

e. Combination pressure relief valve

f. Flange

g. Liquid valve and vapor valve (ball versus plug type)
h. Manway, manway cover plate, hinged and bolted manway cover, protective housing
i. Open gauging devices (e.g., slip tube)
j. Pressure regulators on carbon dioxide cars and liquefied atmospheric gases in cryogenic liquid tank cars
k. Quick-fill hole cover
l. Combination pressure relief valve
m. Pressure relief valve
n. Safety vent disk
o. Sample line
p. Thermometer well
q. Vacuum relief valve (negative pressure or vacuum)
r. Washout

10. Given examples of each of the following types of tank car damage, identify the type of damage in each example:
    a. Corrosion
    b. Crack
    c. Dent
    d. Flame impingement
    e. Puncture
    f. Score, gouge, wheel burn, rail burn
11. Given examples (actual or simulated) of scores, gouges, wheel burns, and rail burns, perform each of the following tasks:
    a. Use a depth gauge to measure the depth of each score, gouge, wheel burn, and rail burn
    b. Point out where each score, gouge, wheel burn, and rail burn crosses a weld, if that condition exists
    c. Measure the depth of the weld metal removed at any point where the score, gouge, wheel burn, and rail burn crosses a weld
    d. Given examples (actual or simulated) of where a score, gouge, wheel burn, and rail burn crosses a weld, determine if the heat-affected zone has been damaged
12. Given examples (actual or simulated) of dents and rail burns, perform each of the following tasks:
    a. Use a dent gauge to determine if the radius of curvature for each dent or rail burn is critical

b. Recognize those examples that include cracks at the point of minimum curvature

13. Given examples of damaged tank car fittings, describe the extent of damage to those fittings
14. Given examples of tank car tank damage, describe the extent of damage to the tank car tank
15. Given a tank car, its contents, and the applicable equipment and reference material, determine the pressure in the tank, using either of the following methods:
    a. Pressure gauge
    b. Temperature of the contents
16. Given a tank car, use the tank car's gauging device to determine the outage in the tank

TECH TC1.2 Predicting the Likely Behavior of the Tank Car and Its Contents

Technicians with a tank car specialty shall predict the likely behavior of the tank car and its contents and shall complete the following tasks:

1. Given the following types of tank cars, describe the likely breach and release mechanisms associated with each type:
    a. Cryogenic liquid tank cars
    b. Non-pressure tank cars
    c. Pneumatically unloaded covered hopper cars
    d. Pressure tank cars
2. Describe the difference in the following types of construction materials used in tank cars and their significance in assessing tank damage:
    a. Alloy steel
    b. Aluminum
    c. Carbon steel
3. Describe the significance of selection of lading for compatibility with tank car construction material
4. Describe the significance of lining and cladding on tank cars in assessing tank damage
5. Describe the significance of the jacket on tank cars in assessing tank damage
6. Describe the significance of insulation and thermal protection on tank cars in assessing tank damage
7. Describe the significance of jacketed and sprayed-on thermal protection on tank cars in assessing tank damage
8. Describe the significance of interior and exterior heater coils on tank cars in assessing tank damage

9. Describe the significance of each of the following types of tank car damage on different types of tank cars in assessing tank damage:
    a. Corrosion
    b. Crack
    c. Dent
    d. Flame impingement
    e. Puncture
    f. Score, gouge, wheel burn, and rail burn
10. Describe the significance of the depth of scores, gouges, wheel burns, and rail burns on tank cars in assessing tank damage
11. Describe the significance of damage to the heat-affected zone of a weld on a tank car in assessing tank damage
12. Describe the significance of a critical dent on a tank car in assessing tank damage, including scores, gouges, wheel burns, and rail burns
13. Given various types of tank cars, describe the significance of pressure increases in assessing tank damage
14. Given various types of tank cars, describe the significance of the amount of lading in the tank in assessing tank damage
15. Describe the significance of flame impingement on the vapor space and liquid space as it relates to a tank car

TECH TC 2 Planning the Response

TECH TC 2.1 Determining the Response Options

Given the analysis of an emergency involving tank cars, technicians with a tank car specialty shall determine the response options for each tank car involved and shall complete the following tasks:

1. Describe the purpose of, potential risks associated with, procedures for, equipment required to implement, and safety precautions for the following product removal techniques for tank cars:
    a. Flaring liquids and vapors
    b. Hot and cold tapping
    c. Transferring liquids and vapors
    d. Vent and burn
    e. Venting
2. Describe the inherent risks associated with, procedures for, equipment required to implement, and safety precautions for leak control techniques on various tank car fittings

3. Describe the effect flaring or venting gas or liquid has on the pressure in the tank
4. Describe the inherent risks associated with, procedures for, equipment required to implement, and safety precautions for movement of damaged tank cars
5. Describe the inherent risks associated with, procedures for, and safety precautions for the following operations:
    a. Setting and releasing brakes on rail cars
    b. Shutting off locomotives using the fuel shutoff and the battery disconnect
    c. Uncoupling rail cars
6. Describe the hazards associated with working on railroad property during emergencies

TECH TC 3 Implementing the Planned Response

TECH TC 3.1 Implementing the Planned Response

Given an analysis of an emergency involving tank cars and the planned response, technicians with a tank car specialty shall implement or oversee the implementation of the selected response options safely and effectively and shall complete the following tasks:

1. Given a leaking manway cover plate (loose bolts), control the leak
2. Given leaking packing on the following tank car fittings, control the leak:
    a. Gauging device packing nut
    b. Liquid or vapor valve packing nut
    c. Top-operated bottom outlet valve packing gland
3. Given an open bottom outlet valve with a defective gasket in the cap, control the leak
4. Given a leaking top-operated bottom outlet valve, close valve completely to control leak
5. Given leaking fittings on a pressure tank car, use an applicable capping kit to control the leak
6. Given the following types of leaks on various types of tank cars, plug or patch those leaks:
    a. Cracks, splits, or tears
    b. Puncture
7. Given the applicable equipment and resources, demonstrate the following:
    a. Flaring of liquids and vapors
    b. Transferring of liquids and vapors
    c. Venting

8. Given the applicable resources, perform the following tasks:
    a. Set and release the hand brake on rail cars
    b. Shut off locomotives using the fuel shutoff and the battery disconnect
    c. Uncouple rail cars
9. Demonstrate grounding and bonding procedures for product transfer from tank cars, including the following:
    a. Selection of equipment
    b. Establishment of ground field
    c. Sequence of grounding and bonding connections
    d. Testing of ground field and grounding and bonding connections

Training Guidelines for Hazardous Materials Technicians with a Cargo Tank Specialty

Introduction

The hazardous materials technician with a cargo tank specialty shall be that person who provides technical support pertaining to cargo tanks, provides oversight for product removal and movement of damaged cargo tanks, and acts as a liaison between technicians and outside resources.

Training Requirements

The hazardous materials technician with a cargo tank specialty shall be trained at the technician level and meet all competencies of this chapter.

Hazardous materials technicians with a cargo tank specialty shall also receive training to meet governmental response and occupational health and safety regulations.

Goal

The goal of competencies in this chapter shall be to provide the technician with a cargo tank specialty with a minimum set of knowledge and skills to perform the tasks safely.

Tasks

When responding to hazardous materials/WMD incidents, the hazardous materials technician with a cargo tank specialty shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident involving cargo tanks to determine the complexity of the problem and potential outcomes by completing the following tasks:

    a. Determine the type and extent of damage to cargo tanks

    b. Predict the likely behavior of cargo tanks and their contents in an emergency

2. Plan a response for an emergency involving cargo tanks within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by determining the response options (offensive, defensive, and nonintervention) for a hazardous materials/WMD incident involving cargo tanks

3. Implement or oversee the implementation of the planned response to a hazardous materials/WMD incident involving cargo tanks

Mandating of Competencies

This training guideline does not mandate that hazardous materials response teams performing offensive operations on cargo tanks have technicians with a cargo tank specialty.

If a hazardous materials response team elects to train some or all of its hazardous materials technicians to have in-depth knowledge of cargo tanks, this chapter shall set out the required competencies.

TECH CT 1 Analyzing the Incident

TECH CT1.1 Determining the Type and Extent of Damage to Cargo Tanks

Given examples of damaged cargo tanks, technicians with a cargo tank specialty shall describe the type and extent of damage to each cargo tank and its fittings and shall complete the following tasks:

1. Given the specification mark for a cargo tank and the reference materials, describe the tank's basic construction and features
2. Given examples of cargo tanks (jacketed and not jacketed), identify the jacketed cargo tanks
3. Given examples of the following types of cargo tank damage, identify the type of damage in each example:
    a. Corrosion (internal and external)
    b. Crack
    c. Dent
    d. Flame impingement
    e. Puncture
    f. Scrape, score, gouge, or loss of metal
4. Given examples of damage to an MC-331 cargo tank, determine the extent of damage to the heat-affected zone
5. Given an MC-331 cargo tank containing a compressed liquefied gas, determine the amount of liquid in the tank
6. Given MC-306/DOT-406, MC-307/DOT-407, and MC-312/DOT-412 cargo tanks, identify and describe the design, construction, and operation of each of the following safety devices:
    a. Dome cover design
    b. Emergency remote shutoff device
    c. Internal stop valve or external valve with accident protection, including method of activation (pneumatic, mechanical, hydraulic)
    d. Pressure and vacuum relief protection devices
    e. Shear-type breakaway piping
    f. Fusible caps, plugs, links, and nuts
7. Given MC-331 and MC-338 cargo tanks, point out and explain the design, construction, and operation of each of the following safety devices:

a. Emergency remote shutoff device
b. Excess flow valve
c. Fusible link and nut assemblies
d. Internal self-closing stop valve or external valve with accident protection, including method of activation (pneumatic, cable, hydraulic)
e. Pressure relief protection devices

8. Given an MC-306/DOT-406 cargo tank, identify and describe the following normal methods of loading and unloading:
   a. Bottom loading
   b. Top loading
   c. Vapor recovery system
9. Given the following types of cargo tank and tube trailers, identify and describe the normal methods of loading and unloading:
   a. MC-307/DOT-407
   b. MC-312/DOT-412
   c. MC-331
   d. MC-338
   e. Compressed gas tube trailer
10. Describe the normal and emergency methods of activation for the following types of cargo tank valve systems:
    a. Pneumatic
    b. Mechanical
    c. Hydraulic
11. Given a cargo tank involved in an emergency, identify the factors to be evaluated as part of the cargo tank damage assessment process, including the following:
    a. Amount of product released and amount remaining in the cargo tank
    b. Stress applied to the cargo tank
    c. Nature of the emergency (e.g., rollover, vehicle accident, struck by object)
    d. Number of compartments
    e. Pressurized or non-pressurized
    f. Type and nature of tank damage (e.g., puncture, dome cover leak, valve failure)
    g. Type of cargo tank (MC or DOT specification)
    h. Material of construction (e.g., aluminum, steel, composites)

TECH CT 1.2 Predicting the Likely Behavior of the Cargo Tank and Its Contents

Technicians with a cargo tank specialty shall predict the likely behavior of the cargo tank and its contents and shall complete the following tasks:

1. Given the following types of cargo tanks, describe the likely breach and release mechanisms:
   a. MC-306/DOT-406 cargo tanks
   b. MC-307/DOT-407 cargo tanks
   c. MC-312/DOT-412 cargo tanks
   d. MC-331 cargo tanks
   e. MC-338 cargo tanks
   f. Compressed gas tube trailer
2. Describe the difference in types of construction materials used in cargo tanks and their significance in assessing tank damage
3. Describe the significance of the cargo tank jacket in assessing tank damage
4. Describe the significance of each of the following types of damage on cargo tanks during damage assessment:
   a. Corrosion (internal and external)
   b. Crack
   c. Dent
   d. Flame impingement
   e. Puncture
   f. Scrape, score, gouge, or other reduction in tank shell thickness
5. Given examples of damage to the heat-affected zone on an MC-331 cargo tank, describe its significance

TECH CT 2 Planning the Response

TECH CT 2.1 Determining the Response Options

Given the analysis of an emergency involving cargo tanks, technicians with a cargo tank specialty shall determine the response options for each cargo tank involved and shall complete the following tasks:

1. Given an emergency involving a cargo tank, describe the methods, procedures, risks, safety precautions, and equipment required to implement spill and leak control procedures
2. Given an overturned cargo tank, describe the factors to be evaluated for up-righting the overturned tank, including the following:
   a. Condition and weight of the cargo tank
   b. Lifting capabilities of wreckers and cranes
   c. Preferred lifting points

d. Selection of lifting straps and air bags

e. Site safety precautions

f. Type and nature of stress applied to the cargo tank

g. Type of cargo tank and material of construction

TECH CT 3 Implementing the Planned Response

TECH CT 3.1 Implementing the Planned Response

Given an analysis of an emergency involving a cargo tank and the planned response, technicians with a cargo tank specialty shall implement or oversee the implementation of the selected response safely and effectively and shall complete the following tasks:

1. Demonstrate the methods for containing the following leaks on liquid cargo tanks (e.g., MC-306/DOT-406, MC-307/ DOT-407, and MC-312/DOT-412):
   a. Dome cover leak
   b. Pressure relief devices (e.g., vents, rupture disc)
   c. Puncture
   d. Split or tear
   e. Valves and piping
2. Describe the methods for containing the following leaks in MC-331 and MC-338 cargo tanks:
   a. Crack
   b. Failure of pressure relief device (e.g., relief valve, rupture disc)
   c. Valves and piping
   d. Puncture
   e. Split or tear
3. Demonstrate grounding and bonding procedures for product transfer from cargo tanks, including the following:
   a. Selection of equipment
   b. Establishment of ground field
   c. Sequence of grounding and bonding connections
   d. Testing of ground field and grounding and bonding connections
4. Given the following product transfer and recovery equipment, demonstrate the safe application and use of each:
   a. Portable pumps (air, electrical, gasoline, and diesel)
   b. Compressors or compressed gas

c. Vacuum trucks

d. Vehicles with power-takeoff (PTO) driven pumps

5. Given a scenario involving an overturned MC-306/DOT-406 cargo tank, demonstrate the safe procedures for the following methods of product removal and transfer:

   a. Drilling

   b. Internal self-closing stop valve

   c. Unloading lines

   d. Vapor recovery lines

6. Given a scenario involving an overturned MC-307/DOT-407 cargo tank, demonstrate the safe procedures for the following methods of product removal and transfer:

   a. Cleanout cap

   b. Product loading and unloading outlet

   c. Product lines

7. Given a scenario involving an overturned MC-331 cargo tank, demonstrate the safe procedures for product removal and transfer:

   a. Vapor line

   b. Liquid line

   c. Hot tap

8. Given the necessary resources, demonstrate the flaring of an MC-331 flammable gas cargo tank

Training Guidelines for Hazardous Materials Technicians with an Intermodal Tank Specialty

Introduction

The hazardous materials technician with an intermodal tank specialty shall be that person who provides technical support pertaining to intermodal tanks, provides oversight for product removal and movement of damaged intermodal tanks, and acts as a liaison between the technicians and outside resources.

Training Requirements

The hazardous materials technician with an intermodal tank specialty shall be trained at the technician level and meet all competencies of this chapter.

Hazardous materials technicians with an intermodal tank specialty shall also receive training to meet governmental response and occupational health and safety regulations.

Goal

The goal of these training guidelines is to provide the technician with an intermodal tank specialty with a minimum set of knowledge and skills to perform the tasks safely.

Tasks

When responding to a hazardous materials/WMD incident, the hazardous materials technician with an intermodal tank specialty shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident involving an intermodal tank to determine the complexity of the problem and potential outcomes by completing the following tasks:

    a. Determine the type and extent of damage to an intermodal tank

    b. Predict the likely behavior of an intermodal tank and its contents in an emergency

2. Plan a response for an emergency involving an intermodal tank within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by determining the response options (offensive, defensive, and nonintervention) for a hazardous materials emergency involving intermodal tanks

3. Implement or oversee the implementation of the planned response to a hazardous materials/WMD incident involving intermodal tanks

Mandating of Competencies

These training guidelines do not mandate that hazardous materials response teams performing offensive operations on intermodal tanks have technicians with an intermodal tank specialty.

If a hazardous materials response team elects to train some or all its hazardous materials technicians to have in-depth knowledge of intermodal tanks, this guideline will set out the minimum required competencies.

TECH IM 1 Analyzing the Incident

TECH IM 1.1 Determining the Type and Extent of Damage to Intermodal Tanks

Given examples of damaged intermodal tanks, the hazardous materials technician with an intermodal tank specialty shall describe the type and extent of damage to each intermodal tank and its fittings and shall complete the following tasks:

1. Given the specification mark for an intermodal tank and the reference materials, describe the tank's basic construction and features
2. Given examples of intermodal tanks (jacketed and not jacketed), identify the jacketed intermodal tanks
3. Given examples of various intermodal tanks, identify and describe the design and purpose of each of the following intermodal tank components, when present:
    a. Corner casting
    b. Data plate
    c. Heater coils (steam and electric)
    d. Insulation
    e. Jacket
    f. Refrigeration unit
    g. Supporting frame
4. Given examples of various fittings arrangements for pressure, non-pressure, and cryogenic intermodal tanks, point out and explain the design, construction, and operation of each of the following fittings, where present:
    a. Air line connection
    b. Bottom outlet valve
    c. Gauging device
    d. Liquid or vapor valve
    e. Thermometer
    f. Manhole cover
    g. Pressure gauge
    h. Sample valve
    i. Spill box

j. Thermometer well

k. Top outlet

5. Given examples of various safety devices for pressure, non-pressure, and cryogenic intermodal tanks, point out and explain the design, construction, and operation of each of the following safety devices, where present:

   a. Emergency remote shutoff device

   b. Excess flow valve

   c. Fusible link/nut assemblies

   d. Regulator valve

   e. Rupture disc

   f. Pressure relief valve

6. Given the following types of intermodal tank damage, identify the type of damage in each example and explain its significance:

   a. Corrosion (internal and external)

   b. Crack

   c. Dent

   d. Flame impingement

   e. Metal loss (gouge and score)

   f. Puncture

7. Given three examples of damage to the framework of intermodal tanks, describe the damage in each example and explain its significance in the analysis process

8. Given an intermodal tank involved in an emergency, identify the factors to be evaluated as part of the intermodal tank damage assessment process, including the following:

   a. Amount of product released and amount remaining in the intermodal tank

   b. Container stress applied to the intermodal tank

   c. Nature of the emergency

   d. Number of compartments

   e. Pressurized or non-pressurized

   f. Type and nature of tank damage

   g. Type of intermodal tank

   h. Type of tank metal

9. Given a pressurized intermodal tank containing a liquefied gas, determine the amount of liquid in the tank

10. Given examples of damage to a pressurized intermodal tank, determine the extent of damage to the heat-affected zone

TECH IM 1.2 Predicting the Likely Behavior of the Intermodal Tank and Its Contents

Technicians with an intermodal tank specialty shall predict the likely behavior of the intermodal tank and its contents and shall complete the following tasks:

1. Given the following types of intermodal tanks, describe the likely breach/release mechanisms:
   a. IMO Type 1/IM-101
   b. IMO Type 2/IM-102
   c. IMO Type 5/DOT-51
   d. DOT-56
   e. DOT-57
   f. DOT-60
   g. Cryogenic (IMO Type 7)
2. Describe the difference in types of construction materials used in intermodal tanks relative to assessing tank damage

TECH IM 2 Planning the Response

TECH IM 2.1 Determining the Response Options

Given the analysis of an emergency involving intermodal tanks, technicians with an intermodal tank specialty shall determine the response options for each intermodal tank involved and shall complete the following tasks:

1. Describe the purpose of, potential risks associated with, procedures for, equipment required to implement, and safety precautions for the following product removal techniques for intermodal tanks:
   a. Flaring liquids and vapors
   b. Hot tapping
   c. Transferring liquids and vapors (pressure and pump)
2. Describe the purpose of, procedures for, and risks associated with controlling leaks from various fittings on intermodal tanks, including equipment needed and safety precautions

TECH IM 3 **Implementing the Planned Response**

Given an analysis of an emergency involving intermodal tanks and the planned response, technicians with an intermodal tank specialty shall implement or oversee the implementation of the selected response options safely and effectively and shall complete the following tasks:

1. Given leaks from the following fittings on intermodal tanks, control the leaks using approved methods and procedures:
    a. Bottom outlet
    b. Liquid/vapor valve
    c. Manway cover
    d. Pressure relief device
    e. Tank
2. Given the applicable equipment and resources, demonstrate the following:
    a. Flaring of liquids and vapors
    b. Transferring of liquids and vapors
    c. Venting
3. Demonstrate approved procedures for the following types of emergency product removal:
    a. Gas and liquid transfer (pressure and pump)
    b. Flaring
    c. Venting
4. Demonstrate grounding and bonding procedures for the product transfer from intermodal tanks, including the following:
    a. Selection of equipment
    b. Establishment of ground field
    c. Sequence of grounding and bonding connections
    d. Testing of ground field and grounding and bonding connections
5. Demonstrate the methods for containing the following leaks on liquid intermodal tanks (e.g., IM-101 and IM-102):
    a. Dome cover leak
    b. Irregular-shaped hole
    c. Pressure relief devices (e.g., vents, rupture disc)
    d. Puncture
    e. Split or tear
    f. Valves and piping

6. Describe the methods for containing the following leaks in pressure intermodal tanks:
    a. Crack
    b. Failure of pressure relief device (e.g., relief valve, rupture disc)
    c. Valves and piping
7. Given the following product transfer and recovery equipment, demonstrate the safe and correct application and use of the following:
    a. Portable pumps (air, electrical, gasoline, and diesel)
    b. Pressure transfers
    c. Vacuum trucks
    d. Vehicles with power-takeoff driven pumps
8. Given a scenario involving an overturned liquid intermodal tank, demonstrate the safe procedures for product removal and transfer
9. Given a scenario involving an overturned pressure intermodal tank, demonstrate the safe procedures for product removal and transfer`

Training Guidelines for Hazardous Materials Technicians with a Marine Tank and Non-Tank Vessel Specialty

Introduction

Technicians with a marine tank and non-tank vessel specialty shall be trained at the hazardous materials technician level and meet all guidelines found in this section

Training Requirements

The technician with a marine tank and non-tank vessel specialty also shall possess training to meet applicable USCG, DOT, EPA, OSHA, and other state, local, or provincial occupational health and safety regulatory requirements.

Hazardous materials technicians with an intermodal tank specialty shall also receive training to meet governmental response and occupational health and safety regulations.

Goal

The goal of these training guidelines shall be to provide the hazardous materials technician with a marine tank and non-tank vessel specialty with a minimum set of knowledge and skills to perform the tasks safely.

Tasks

In addition to being competent at the hazardous materials technician level, the technician with a marine tank and non-tank vessel specialty shall be able to perform the following tasks:

1. Analyze a hazardous materials incident involving marine tank and non-tank vessels to determine the magnitude of the problem in terms of outcomes by completing the following tasks:
    a. Determine the type and extent of damage to marine tank and non-tank vessels and its cargo systems
    b. Predict the likely behavior of marine tank and non-tank vessels and its contents in an emergency
    c. Establish initial appropriate controls
2. Plan a response for an emergency involving marine tank vessels within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:
    a. Determine the response options (offensive, defensive, and nonintervention) for a hazardous materials emergency involving marine tank vessels
    b. Ensure that the options are within the capabilities and competencies of available personnel, personal protective equipment, and control equipment

3. Implement the planned response to a hazardous materials incident involving marine tank vessels

Mandating of Competencies

These guidelines do not mandate that hazardous materials response teams performing offensive operations on marine tank vessels have technicians with a marine tank and non-tank vessel specialty.

Hazardous materials technicians operating within the bounds of their training shall be able to respond to marine vessel incidents.

If a hazardous materials response team desires to train some or all its technicians to have in-depth knowledge of marine tank and non-tank vessels, these guidelines identify the minimum required competencies.

TECH MV 1 Analyzing the Incident

TECH MV 1.1 Determining the Type and Extent of Damage to Marine Vessels, Tank and Non-Tank

Given examples of damaged marine vessels, the technician with a marine tank and non-tank vessel specialty shall describe the type and extent of damage to each marine vessel and its cargo ballast systems and shall meet the following related requirements:

1. Given examples of marine vessels, describe a marine vessel's basic construction and arrangement features, for marine tank and non-tank vessels
2. Given examples of various marine vessels, point out and explain the design and purpose of each of the various types of marine vessel cargo/ballast compartment design, structure, and components, when present
3. Given examples of various fittings arrangements for marine tank and non-tank vessels, point out and explain the design, construction, and operation of each
4. Given a marine tank and non-tank vessel, identify and describe the normal methods of cargo transfer
5. Given a marine non-tank vessel, describe the following systems processes used in conjunction with cargo transfer:
    a. Cargo transfer system (including liquid and vent piping arrangements)
    b. Mechanical systems (cranes, booms, belts, etc.)
    c. Pressure systems
    d. Vacuum systems

e. Cargo securing system components (tie-downs, lashings, twist-locks, etc.)

6. Given a marine tank vessel, describe the following systems/processes used in conjunction with cargo transfer:
   a. Cargo transfer system (including liquid and vent piping arrangements)
   b. Vapor recovery system
   c. Vapor balancing
   d. Pressuring cargo
   e. Vacuum systems
   f. Purging with an inert medium prior to transfer
   g. Padding tanks
   h. Inert gas system (tank vessel only)
   i. Cargo monitoring systems (tank levels/alarms, tank pressures, pump controls, cargo line pressures, and cargo temperatures)
7. Given the following types of cargo compartment damage on marine vessels, identify the type of damage in each example and explain its significance:
   a. Crack, puncture, slit, or tear
   b. Dent
   c. Flame impingement
   d. Over- or under pressurization
   e. Brittle fracture
   f. Pinhole or corrosion
   g. Damage to a heat-affected zone (i.e., welded areas)
8. Given examples of the types of emergency situations a marine vessel may experience that may result in damage to the vessel or its cargo transfer system, describe the following types of marine vessel emergencies and explain their significance related to the vessel's seaworthiness and cargo containment:
   a. Grounding
   b. Stranding
   c. Allision/collision
   d. Foundering
   e. Heavy weather damage
   f. Fire
   g. Explosion/BLEVE

h. Polymerization and/or chemical reaction

i. Cargo shifting or fluidization/liquefaction

9. Given a marine vessel involved in an emergency, identify the factors to be evaluated as part of the marine vessel damage assessment process, including the following:

   a. Type of marine vessel

   b. Type and location of damage

   c. Fire control, stability, and ventilation plans/documentation

   d. Dangerous cargo manifest

   e. Stowage plan

   f. Ingress and egress and potential restrictions due to security arrangements

   g. Bilge and ballast arrangements

   h. Pressurized or non-pressurized systems

   i. Cargo pumping arrangements (tank vessels only)

   j. Number and location of cargo compartments

   k. Cargo transfer and monitoring control system/location

   l. Location/arrangement of void spaces in cargo area

   m. Type/characteristics of cargoes in the damaged cargo system

   n. Type/characteristics of other cargoes on the marine non-tank vessel (outside the damaged area)

   o. Cargo compatibility

   p. Stability and stresses applied to the marine non-tank vessel

   q. Type and nature of cargo system damage

   r. Amount of product both released and remaining in the cargo compartment

10. Given a cargo system containing a bulk liquid, determine the amount of liquid in the cargo tank

TECH MV 1.2 Predicting the Likely Behavior of the Marine Vessel and Its Contents

The hazardous materials technician with a marine tank and non-tank vessel specialty shall understand the likely behavior of both marine tank vessels and marine non-tank vessels, as well as the vessel's contents, and meet the following related requirements:

1. Given the following types of marine vessels, provide examples of probable causes of releases:

   a. Certain bulk dangerous cargo ships (46 CFR Subchapter O, Parts 150–153)

i. Chemical tank ships
ii. Sophisticated parcel chemical tank ships
iii. Specialized chemical tank ships
iv. Chemical tank barges

b. Liquefied gas tank ships (46 CFR Subchapter O, Parts 151 or 154)
i. Fully pressurized tank ships
ii. Semi-pressurized tank ships
iii. Ethylene (LPG and chemical gas) ships
iv. Fully refrigerated tank ships
v. Liquefied natural gas (LNG) ships
vi. Liquefied gas barges

c. Tank ships (46 CFR Subchapter D, Parts 30–39)
i. Oil tank barges
ii. Oil tank ships

d. Cargo and miscellaneous vessels (46 CFR Subchapter I, Parts 90–105)
i. Container vessels
ii. Break bulk
iii. Roll on/roll off (RoRo) vessels
iv. Dry bulk cargo ships or barges

e. Offshore supply vessels (46 CFR Subchapter L, Parts 125–134)

f. Passenger vessels (46 CFR Subchapter H, Parts 70–79)
i. Cruise ship
ii. Ferries

g. Other vessels
i. Tug boats (46 CFR Subchapter C, Parts 24–27)
ii. Fishing vessels (46 CFR Subchapter C, Parts 24–28)
iii. Crew boat (46 CFR Subchapter T, Parts 175–185)
iv. Mobile offshore drilling unit (46 CFR Subchapter I-A, Parts 107–109)

2. Describe the significance of internal and external forces on a marine vessel's stress and stability in assessing marine vessel damage

3. Given examples of the resulting damages to the cargo compartments and cargo transfer systems on marine vessels, describe the significance in the risk analysis process:
    a. Cargo spills or releases
    b. Tank leakage within the vessel
    c. Overpressure/vacuum damage
    d. Shifting cargo
    e. Cargo/container securing systems
4. Describe the significance of the following when assessing marine tank vessel damage:
    a. Lining and cladding on cargo compartments
    b. Coated and uncoated cargo compartments
    c. Insulation or thermal protection
    d. Heating or refrigeration coils in cargo compartments

TECH MV 2 Planning the Response

TECH MV 2.1 Determining the Response Options

Given the analysis of an emergency involving marine vessels, the technician with a marine tank and non-tank vessel specialty shall determine the response options for each marine vessel involved and shall meet the following related requirements:

1. Describe the methods, procedures, risks, safety precautions, and equipment that are required to implement hazardous cargo incident control procedures for various types of incidents and marine vessels
2. Describe the purpose of, potential risks associated with, procedures for, equipment required to implement, and safety precautions for the following product removal techniques for hazardous materials in all forms, including bulk, non-bulk, solids, liquids, and gases:
    a. Vessel to/from shore transfer
    b. Vessel-to-vessel transfer
    c. Vessel to/from tank truck transfer
    d. Vessel to/from rail car transfer
    e. Internal transfer within the vessel
    f. Jettisoning of cargo
    g. Other types of transfers (e.g., frac/portable tanks)
3. Describe the purpose of, procedures for, and risks associated with controlling leaks from various fittings on marine vessel cargo systems, including equipment needed and safety precautions

4. Describe the hazards associated with working with vessels and marine property during emergencies

TECH MV 3 Implementing the Planned Response

TECH MV 3.1 Implementing the Planned Response

Given an analysis of an emergency involving marine vessels and the planned response, the technician with a marine tank and non-tank vessel specialty shall implement or oversee the implementation of the selected response options safely and effectively and shall meet the following related requirements:

1. Given a release from the following fittings on marine tank vessels, describe appropriate methods and procedures for controlling the release:
    a. Tank hatch/expansion trunk
    b. Valve or fitting
    c. Cargo compartment vent/access hatch/door
    d. Pressure/relief device (pressure and vacuum)
    e. Manifold or pipeline
    f. Transfer hoses and connections
    g. Other deck penetrations
    h. Bulk and non-bulk packaging
2. Describe approved procedures for the following types of emergency cargo removal on board marine tank vessels:
    a. Gas/liquid transfer (pressure/pump)
    b. Flaring
    c. Venting
    d. Jettisoning of cargo
3. Describe appropriate procedures for the following types of emergency cargo removal on board marine non-tank vessels:
    a. Cranes and other lifting equipment
    b. Unloading systems
    c. Ramps and other vehicular methods
    d. Gas/liquid transfer (pressure/pump)
    e. Venting
    f. Jettisoning of cargo
4. Describe the importance of bonding, grounding, or isolation procedures for the transfer of flammable and combustible cargoes, or

other products that can give off flammable gases or vapors when heated or contaminated

5. Demonstrate the methods for containing the following leaks on marine vessels:
    a. Puncture
    b. Irregular-shaped hole
    c. Split or tear
    d. Dome/hatch cover leak
    e. Valves and piping failure
    f. Pressure relief devices (e.g., vents, burst/rupture disc)
6. Given the following product transfer and recovery equipment, describe the safe and correct application and use of the following:
    a. Portable pumps (air, electrical, hydraulic, gasoline/diesel)
    b. Vehicles with power-take-off driven pumps
    c. Vehicles, such as fork lifts
    d. Pressure liquid transfer equipment
    e. Vacuum trucks
    f. Cranes
    g. Ramps
    h. Conveyors
7. Given the necessary resources, describe the flaring of a pressure flammable gas from a liquefied gas tank vessel (ship or barge, as applicable)
8. Given a scenario involving flammable liquid spill from a marine tank vessel, describe the procedures for site safety and fire control during cleanup and removal operations

Training Guidelines for Hazardous Materials Technicians with a Flammable Liquids Bulk Storage Specialty

Introduction

The hazardous material technician with a flammable liquids bulk storage specialty shall be that person who, in incidents involving bulk flammable liquid storage tanks and related facilities, provides support to the hazardous materials technician and other personnel, provides strategic and tactical recommendations to the on-scene incident commander, provides oversight for fire control and product removal operations, and acts as a liaison between technicians, response personnel, and outside resources. For the purposes of this section, flammable liquid bulk storage tanks also include the related pipelines, piping, transfer pumps, additive tanks, and loading racks commonly found in a flammable liquid bulk storage tank facility.

Training Requirements

The hazardous materials technician with a flammable liquids bulk storage specialty shall be trained at the technician level and meet all competencies of this chapter.

Hazardous materials technicians with a flammable liquids bulk storage specialty shall also receive training to meet governmental response and occupational health and safety regulations.

Goals

The goal of the competencies in this chapter shall be to provide the hazardous materials technician with a flammable liquid bulk storage specialty with a minimum set of knowledge and skills to perform the tasks safely.

Tasks

In addition to being competent at the hazardous materials technician level, the hazardous materials technician with a flammable liquids bulk storage specialty shall be able to perform the following tasks:

1. Analyze an incident involving a bulk flammable liquid storage tank to determine the magnitude of the problem by completing the following tasks:
    a. Determine the type and extent of damage to the bulk liquid storage tank
    b. Predict the likely behavior of the bulk liquid storage tank and its contents in an incident
2. Plan a response for an incident involving a flammable liquid bulk storage tank within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:
    a. Determine the response options (offensive, defensive, and nonintervention) for a hazardous materials/WMD incident involving flammable liquid bulk storage tanks
    b. Ensure that the options are within the capabilities and competencies of available personnel, personal protective equipment, and control equipment

3. Implement the planned response to a hazardous materials/WMD incident involving a flammable liquid bulk storage tank

Mandating of Competencies

These training guidelines do not mandate that hazardous materials response teams performing offensive operations on flammable liquids bulk storage tanks and related facilities have hazardous materials technicians with a flammable liquids bulk storage specialty.

Hazardous materials technicians operating within the bounds of their training shall be able to respond to incidents involving flammable liquids bulk storage tanks and related facilities.

If a hazardous materials response team desires to train some or all its hazardous materials technicians to have in-depth knowledge of flammable liquids bulk storage tanks and related facilities, this section shall set out the minimum required competencies.

TECH BSF 1 Analyzing the Incident

TECH BSF 1.1 Determining the Type and Extent of Damage to the Bulk Storage Tank

Given examples of incidents involving bulk flammable liquid storage tanks, technicians with a flammable gases bulk storage specialty shall describe the type of storage tank and the type and extent of damage to the tank and its associated valves, piping, fittings, and related equipment by completing the tasks in 16.2.1.1 through 16.2.1.5.

TECH BSF 1.1.1 Given examples of various hydrocarbon and polar solvent fuels, technicians with a flammable liquids bulk storage specialty shall describe their physical and chemical properties and their impact upon the selection, application, and use of Class B fire-fighting foams for spill and fire scenarios.

TECH BSF 1.1.2 Given examples of various flammable liquid bulk storage operations, technicians with a flammable liquids bulk storage specialty shall be able to identify and describe the procedures for the normal movement and transfer of product(s) into and out of the facility and storage tanks. Examples shall be based on local or regional facilities and could include marketing terminals, pipeline operations and terminals, refineries, and bulk storage facilities.

TECH BSF 1.1.3 Given examples of the following atmospheric pressure bulk liquid storage tanks, technicians with a flammable liquids bulk storage specialty shall describe each tank's design and construction features and types of products commonly found:

1. Cone roof tank
2. Open (external) floating roof tank

3. Open floating roof tank with a geodesic dome external roof
4. Covered (internal) floating roof tank

TECH BSF 1.1.4 Given examples of the following types of low pressure horizontal and vertical bulk liquid storage tanks, the technician shall be able to describe the tank's uses and design and construction features:

1. Horizontal tank
2. Dome roof tank

TECH BSF 1.1.5 Given examples of various atmospheric and low pressure bulk liquid storage tanks and related facilities, technicians with a flammable liquids bulk storage specialty shall describe the design and purpose of each of the following storage tank components, where present:

1. Tank shell material of construction
2. Type of roof and material of construction
3. Primary and secondary roof seals (as applicable)
4. Incident venting and pressure relief devices
5. Tank valves
6. Tank gauging devices
7. Tank overfill device
8. Secondary containment methods (as applicable)
9. Transfer pumps (horizontal or vertical)
10. Tank piping and piping supports
11. Vapor recovery (VRU) and vapor combustion (VCU) units
12. Loading rack additive tanks
13. Fixed or semi fixed fire protection system

TECH BSF 1.1.6 Given three examples of primary and secondary spill confinement measures, technicians with a flammable liquids bulk storage specialty shall describe the design, construction, and incident response considerations associated with each method provided.

TECH BSF 1.2 **Predicting the Likely Behavior of the Bulk Storage Tank and Contents**

Technicians with a flammable liquids bulk storage specialty shall predict the likely behavior of the tank and its contents.

TECH BSF 1.2.1 Given examples of different types of flammable liquid bulk storage tank facilities, technicians with a flammable liquids bulk storage specialty shall

identify the impact of the following fire and safety features on the behavior of the products during an incident:

1. Tank spacing
2. Product spillage and control (impoundment and diking)
3. Tank venting and flaring systems
4. Transfer and product movement capabilities
5. Monitoring and detection systems
6. Fire protection systems

TECH BSF 1.2.2 Given a flammable liquid bulk storage tank involved in a fire, technicians with a flammable liquids bulk storage specialty shall identify the factors to be evaluated as part of the analysis process, including the following:

1. Type of storage tank
2. Product involved
3. Amount of product within the storage tank
4. Nature of the incident (e.g., seal fire, tank overfill, full-surface fire)
5. Tank spacing and exposures
6. Fixed or semi-fixed fire protection systems present

TECH BSF 1.2.3 Given three types of incidents involving flammable liquid bulk storage tanks, technicians with a flammable liquids bulk storage specialty shall describe the likely fire and spill behavior for each incident.

TECH BSF 1.2.4 Technicians with a flammable liquids bulk storage specialty shall describe the causes, hazards, and methods of handling the following conditions as they relate to fires involving flammable liquid bulk storage tanks:

1. Froth-over
2. Slop-over
3. Boil-over

TECH BSF 2 **Planning the Response**

Given an analysis of an incident involving flammable liquid bulk storage tanks, technicians with a flammable gases bulk storage specialty shall determine response options for the storage tank involved by completing the following tasks.

TECH BSF 2.1 Technicians with a flammable liquids bulk storage specialty shall describe the factors to be considered in evaluating and selecting Class B fire-fighting foam concentrates for use on flammable liquids.

TECH BSF 2.2 Technicians with a flammable liquids bulk storage specialty shall describe the factors to be considered for the portable application of Class B fire-fighting foam concentrates for the following types of incidents:

1. Flammable liquid spill (no fire)
2. Flammable liquid spill (with fire)
3. Flammable liquid storage tank fire

TECH BAF 2.3 Given examples of different types of flammable liquid bulk storage tanks, technicians with a flammable liquids bulk storage specialty shall identify and describe the application, use, and limitations of the types of fixed and semi=fixed fire protection systems that can be used, including the following:

1. Foam chambers
2. Catenary systems
3. Subsurface injection systems
4. Fixed foam monitors
5. Foam and water sprinkler systems

TECH BSF 2.4 Technicians with a flammable liquids bulk storage specialty shall describe the hazards, safety procedures, and tactical guidelines for handling an accumulated (in-depth) flammable liquid-spill fire.

TECH BSF 2.5 Technicians with a flammable liquids bulk storage specialty shall describe the hazards, safety procedures, and tactical guidelines for handling the product and water drainage and runoff problems that can be created at a flammable liquid bulk storage tank fire.

TECH BSF 2.6 Technicians with a flammable liquids bulk storage specialty shall describe the hazards, safety procedures, and tactical guidelines for handling a flammable liquid bulk storage tank with a sunken floating roof.

TECH BSF 2.7 Given a flammable liquid bulk storage tank fire, technicians with a flammable liquids bulk storage specialty shall describe the methods and associated safety considerations for extinguishing the following types of fires by using portable application devices:

1. Pressure vent fire
2. Seal fire on an open floating roof tank
3. Seal fire on an internal floating roof tank
4. Full-surface fire on an internal floating roof tank
5. Full-surface fire on an external floating roof tank

6. Dike fire
7. Pipeline manifold fire

TECH BSF 2.8 Given the size, dimensions, and products involved for a flammable liquid spill fire, technicians with a flammable liquids bulk storage specialty shall determine the following:

1. Applicable extinguishing agent
2. Approved application method (both portable and fixed system applications)
3. Approved application rate and duration
4. Required amount of Class B foam concentrate and required amount of water
5. Volume and rate of application of water for cooling exposed tanks

TECH BSF 2.9 Given the size, dimensions, and product involved for a flammable liquid bulk storage tank fire, technicians with a flammable liquids bulk storage specialty shall determine the following:

1. Applicable extinguishing agent
2. Approved application method (both portable and fixed system applications)
3. Approved application rate and duration
4. Required amount of Class B foam concentrate and required amount of water
5. Volume and rate of application of water for cooling involved and exposed tanks

TECH BSF 2.10 Given the size, dimensions, and product involved for a fire involving a single flammable liquid bulk storage tank and its dike area, technicians with a flammable liquids bulk storage specialty shall determine the following:

1. Applicable extinguishing agent
2. Approved application method (both portable and fixed system applications)
3. Approved application rate and duration
4. Required amount of Class B foam concentrate and required amount of water
5. Volume and rate of application of water for cooling involved and exposed tanks

TECH BSF 2.11 Given the size, dimensions, and product involved for multiple flammable liquid bulk storage tanks burning within a common dike area, technicians

with a flammable liquids bulk storage specialty shall determine the following:

1. Applicable extinguishing agent
2. Approved application method (both portable and fixed system applications)
3. Approved application rate and duration
4. Amount of Class B foam concentrate and water required
5. Volume and rate of application of water for cooling involved and exposed tanks

TECH BSF 3 **Implementing the Planned Response**

Given an analysis of an incident involving flammable liquid bulk storage tanks, technicians with a flammable liquids bulk storage specialty shall implement or oversee the implementation of the selected response options safely and effectively completing the following tasks.

TASK BSF 3.1 Given a scenario involving a flammable liquid fire, technicians with a flammable liquids bulk storage specialty shall demonstrate the safe and effective methods for extinguishing the following types of fires by using portable application devices:

1. Valve and flange fires
2. Pump fire (horizontal or vertical)
3. Pressure vent fire
4. Large spill fire
5. Loading rack fire
6. Storage tank fire

TASK BSF 3.2 Given a scenario involving a three-dimensional flammable liquid fire, technicians with a flammable liquids bulk storage specialty shall demonstrate the safe and effective method for controlling the fire by using portable application devices.

TASK BSF 3.3 Technicians with a flammable liquids bulk storage specialty shall demonstrate grounding and bonding procedures for the transfer of flammable liquids, including the following:

1. Selection of equipment
2. Sequence of grounding and bonding connections
3. Testing of grounding and bonding connections

Training Guidelines for Hazardous Materials Technicians with a Flammable Gases Bulk Storage Specialty

Introduction

The hazardous material technician with a flammable gases bulk storage specialty shall be that person who, in incidents involving bulk flammable gases storage tanks and related facilities, provides support to the hazardous materials technician and other personnel, provides strategic and tactical recommendations to the on-scene incident commander, provides oversight for fire control and product removal operations, and acts as a liaison between technicians, response personnel, and outside resources. For the purposes of this chapter, flammable gases bulk storage tanks also include the related pipelines, piping, transfer pumps, additive tanks, and loading racks commonly found in a flammable gases bulk storage tank facility.

Training Requirements

The hazardous materials technician with a flammable gases bulk storage specialty shall be trained at the technician level and meet all competencies of this chapter.

Hazardous materials technicians with a flammable gases bulk storage specialty shall also receive training to meet governmental response and occupational health and safety regulations.

Goal

The goal of the competencies in this chapter shall be to provide the hazardous materials technician with a flammable gases bulk storage specialty with a minimum set of knowledge and skills to perform the tasks safely.

Tasks

In addition to being competent at the hazardous materials technician level, the hazardous materials technician with a flammable gases bulk storage specialty shall be able to perform the following tasks:

1. Analyze an incident involving a flammable gas bulk storage tank to determine the magnitude of the problem by completing the following tasks:
    a. Determine the type and extent of damage to the bulk storage tank
    b. Predict the likely behavior of the bulk storage tank and its contents in an incident
2. Plan a response for an incident involving a flammable gas bulk storage tank within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:
    a. Determine the response options (offensive, defensive, and nonintervention) for a hazardous materials/WMD incident involving flammable gas bulk storage tanks
    b. Ensure that the options are within the capabilities and competencies of available personnel, personal protective equipment, and control equipment

3. Implement the planned response to a hazardous materials/WMD incident involving a flammable gas bulk storage tank

Mandating of Competencies

These training guidelines do not mandate that hazardous materials response teams performing offensive operations on flammable gases bulk storage tanks and related facilities have hazardous materials technicians with a flammable gases bulk storage specialty. If a hazardous materials response team desires to train some or all its hazardous materials technicians to have in-depth knowledge of flammable gases bulk storage tanks and related facilities, this guideline will set out the minimum required competencies.

TECH FG 1 **Analyzing the Incident**

TECH FG 1.1 **Determining the Type and Extent of Damage to the Bulk Storage Tank**

Given examples of storage tank incidents, technicians with a flammable gases bulk storage specialty shall describe the type of storage tank and extent of damage to the tank and its associated piping and fittings.

TECH FG 1.1.1 Given examples of various flammable gas bulk storage operations, technicians with a flammable gases bulk storage specialty shall identify and describe the procedures for the normal movement and transfer of product(s) into and out of the facility storage tanks.

TECH FG 1.1.2 Given examples of the following types of high pressure bulk gas storage tanks, technicians with a flammable gases bulk storage specialty shall describe the tank's uses and design and construction features:

1. Horizontal (bullet) tank
2. Spherical tank

TECH FG 1.1.3 Given examples of various high pressure bulk gas storage tanks, technicians with a flammable gases bulk storage specialty shall point out and explain the design and purpose of each of the following storage tank components and fittings:

1. Liquid valve and vapor valve
2. Pressure relief valve
3. Gauging device
4. Tank piping and piping supports
5. Transfer pumps
6. Monitoring and detections systems
7. Fixed or semi-fixed fire protection system

TECH FG 1.2 **Predicting the Likely Behavior of the Bulk Storage Tank and Contents**

Technicians with a flammable gases bulk storage specialty shall predict the likely behavior of the tank and its contents.

TECH FG 1.2.1 Given examples of different types of bulk flammable gas storage tank facilities, technicians with a flammable gases bulk storage specialty shall identify the impact of the following fire and safety features on the behavior of the products during an incident:

1. Tank spacing
2. Product spillage and control (impoundment and diking)
3. Tank venting and flaring systems
4. Transfer and product movement capabilities
5. Monitoring and detection systems
6. Fire protection systems

TECH FG 1.2.2 Given examples of different types of flammable gas bulk storage tanks, technicians with a flammable gases bulk storage specialty shall identify and describe the application, use, and limitations of the types of fixed and semi-fixed fire protection systems that can be used, including the following:

1. Water spray systems
2. Fixed water monitors
3. Fixed hydrocarbon monitoring systems

TECH FG 1.2.3 Given a flammable gas bulk storage tank and its associated piping, technicians with a flammable gases bulk storage specialty shall describe the likely breach or release mechanisms and fire scenarios.

TECH FG 2 **Planning the Response**

TECH FG 2.1 Given an analysis of an emergency involving flammable gas storage tanks, technicians with a flammable gases bulk storage specialty shall determine response options for the storage tank involved. The technician with a flammable gases bulk storage specialty shall be able to perform the following tasks.

TECH FG 2.1.1 Technicians with a flammable gases bulk storage specialty shall describe the hazards, safety, and tactical considerations required for the following types of flammable gas incidents:

1. Flammable vapor release (no fire)
2. Flammable vapor release (with fire)

3. Liquefied flammable gas release (no fire)
4. Liquefied flammable gas release (with fire)

TECH FG 2.1.2 Given a flammable gas storage tank with a liquid leak from the pressure relief valve, technicians with a flammable gases bulk storage specialty shall describe the hazards, safety, and tactical considerations for controlling this type of leak.

TECH FG 2.1.3 Given a flammable gas fire from an elevated structure (e.g., tower or column), technicians with a flammable gases bulk storage specialty shall describe the hazards, safety, and tactical considerations for controlling this type of release.

TECH FG 2.1.4 Technicians with a flammable gases bulk storage specialty shall describe the purpose of, potential risks associated with, procedures for, equipment required to implement, and safety precautions for the following product removal techniques:

1. Transfer of liquids and vapors
2. Flaring of liquids and vapors
3. Venting
4. Hot and cold tapping

TECH FG 2.1.5 Technicians with a flammable gases bulk storage specialty shall describe the effect that flaring or venting of gas or liquid has on the pressure in the tank (flammable gas or flammable liquid product).

TECH FG 2.1.6 Technicians with a flammable gases bulk storage specialty shall describe the hazards, safety procedures, and tactical guidelines for handling product and water drainage and runoff problems that can be created at a flammable gas bulk storage facility incident.

TECH FG 3 **Implementing the Planned Response**

TECH FG 3.1 Given an analysis of an emergency involving flammable gas bulk storage tanks, technicians with a flammable gases bulk storage specialty shall implement or oversee the implementation of the selected response options safely and effectively.

TECH FG 3.1.1 Given a scenario involving a flammable gas incident, technicians with a flammable gases bulk storage specialty shall demonstrate the safe and effective methods for controlling the following types of emergencies by using portable application devices:

1. Unignited vapor release
2. Valve and/or flange vapor release (no fire)

3. Valve and/or flange fire
4. Pump fire (horizontal or vertical)

TECH FG 3.1.2 Given a scenario involving the simultaneous release of both flammable liquids and flammable gases, technicians with a flammable gases bulk storage specialty shall demonstrate the safe and effective method for controlling the following types of emergencies by using portable application devices:

1. Unignited vapor release
2. Flange fire
3. Pump seal fire

TECH FG 3.1.3 Technicians with a flammable gases bulk storage specialty shall demonstrate grounding and bonding procedures for the transfer of flammable gases, including the following:

1. Selection of proper equipment
2. Sequence of grounding and bonding connections
3. Proper testing of grounding and bonding connections

TECH FG 3.1.4 Given a scenario involving a flammable gas incident from a bulk storage tank or pipeline, technicians with a flammable gases bulk storage specialty shall describe the procedures for site safety and fire control during cleanup and removal operations.

Training Guidelines for the Hazardous Materials Technician with a Radioactive Material Specialty

Introduction

The hazardous materials technician with a radioactive material specialty shall be that person who provides support to the hazardous materials technician on the use of radiation detection instruments, manages the control of radiation exposure, conducts hazards assessment, and acts as a liaison between hazardous materials technicians at incidents involving radioactive materials.

Training Requirements

The hazardous materials technician with a radioactive material specialty shall be trained at the hazardous materials technician level and meet all competencies of this chapter.

In addition the hazardous materials technician with a radioactive materials specialty shall also receive training to meet governmental response and occupational health and safety regulations.

Goal

The goal of the competencies in this chapter shall be to provide the hazardous materials technician with a radioactive material specialty with a minimum set of knowledge and skills to perform the tasks safely.

Tasks

In addition to being competent at the hazardous materials technician level, the hazardous materials technician with a radioactive material specialty shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident involving radioactive materials to determine the complexity of the problem and potential outcomes

2. Plan a response for an emergency involving radioactive material within the capabilities and competencies of available personnel, personal protective equipment, and control equipment based on an analysis of the radioactive material incident

3. Implement the planned response to a hazardous materials/WMD incident involving radioactive material

Mandating of Competencies

These training guidelines do not mandate that hazardous materials response teams performing offensive operations on radioactive material incident have hazardous materials technicians with a radioactive material specialty.

If a hazardous materials response team elects to train some or all its hazardous materials technicians to have in-depth knowledge of radioactive materials, this training guideline will set out the minimum required competencies.

TECH RAD 1 Analyzing the Incident

TECH RAD 1.1 Understanding Nuclear Science and Radioactivity

Technicians with a radioactive material specialty shall have an understanding of nuclear science and radioactivity, including the units and terms used to describe radiation and radioactive material by completing the following tasks:

1. Define the following terms:
    a. Ionization
    b. Nucleon
    c. Nuclide
    d. Isotope
    e. Excitation
    f. Bremsstrahlung
    g. Fission
    h. Fusion
    i. Criticality
    j. Curie
    k. Becquerel
    l. Specific activity
    m. Half-life
    n. Exposure
    o. Absorbed dose
    p. Dose equivalent
    q. Quality factor
    r. Roentgen
    s. Rad/grav
    t. Rem/sievert
2. Identify the basic principles of the mass-energy equivalence concept
3. Identify how the neutron-to-proton ratio is related to nuclear stability
4. Define the following terms related to nuclear stability:
    a. Radioactivity
    b. Radioactive decay
5. Explain the characteristics of alpha, beta, gamma, and neutron radiations and the methods by which they interact with matter
6. Radiation dispersal device (RDD)
7. Radiation exposure device (RED)
8. Improvised nuclear device (IND) Using reference documents or computer programs, identify the following for a given nuclide:
    a. Atomic number
    b. Atomic mass
    c. Stability

d. Half-life

e. Types and energies of radioactive emissions

9. Given the Chart of Nuclides, trace the decay of a radioactive nuclide and identify the stable end-product
10. Name examples of materials best suited to shield from the following types of radiation:
    a. Alpha
    b. Beta
    c. Gamma
    d. Neutron
11. Explain the concept of linear energy transfer (LET)

TECH RAD 1.2 Understanding the Biological Effects of Ionizing Radiation

Technicians with a radioactive material specialty shall have an understanding of how ionizing radiation affects the human body by completing the following tasks:

1. Define the law of Bergonie and Tribondeau
2. Describe factors that affect the radio-sensitivity of cells
3. Given a list of types of cells, identify which are the most and which are the least radiosensitive
4. Define the following terms and give examples of each:
    a. Stochastic effect
    b. Non-stochastic effect
5. Describe the LD50/30 value for humans
6. Identify the possible somatic and genetic effects of an acute and chronic exposure to radiation
7. Explain the three classic syndromes and four stages of types of the acute radiation syndrome and identify the exposure levels and symptoms associated with each
8. Describe the risks of radiation exposure to the developing embryo and fetus
9. Distinguish between the terms somatic and heritable as they apply to biological effects

TECH RAD 1.3 Radiation Detector Theory

Technicians with a radioactive material specialty shall have an understanding of radiation detector theory in order to select the correct type of radiological survey instrument at a hazardous materials/WMD incident involving radioactive material by completing the following tasks:

1. Given a graph of the gas amplification curve, identify the regions of the curve
2. Identify the characteristics of a detector operated in each of the useful regions of the gas amplification curve
3. Describe the methods employed with gas-filled detectors to discriminate among various types of radiation and various radiation energies
4. Explain how a scintillation detector and associated components operate to detect and measure radiation
5. Explain how neutron detectors detect neutrons and provide an electrical signal
6. Explain the fundamental mechanism by which isotope identification detectors operate and the advantages and disadvantages of the different types of systems available

TECH RAD 1.4 Radioactive Material Transportation

Technicians with a radioactive material specialty shall have an understanding of how radioactive material is transported and how to identify this material at a hazardous materials/WMD incident by completing the following tasks:

1. List the applicable agencies that have regulations governing the transport of radioactive material
2. Identify the types of packages used in the transport of radioactive material and list examples of material shipped in each type of shipping package
3. Identify terminology and acronyms associated with shipments of radioactive material
4. Describe methods that can be used to determine the radionuclide contents of a package
5. Identify the information contained on shipping papers used for transporting radioactive material
6. Describe the radiation and contamination surveys that are performed on radioactive material packages and state the applicable limits
7. Describe the radiation and contamination surveys that are performed on exclusive-use vehicles and state the applicable limits
8. Identify the approved placement of placards on a transport vehicle

TECH RAD 2 Planning the Response

TECH RAD 2.1 External Exposure Control

Given the analysis of an incident involving radioactive material, technicians with a radioactive material specialty shall be able to determine the response options needed to minimize external exposure to radioactive material by completing the following tasks:

1. Calculate the gamma exposure rate for specific radionuclides using equations or by using a computer program
2. Using the stay time equation, calculate an individual's remaining allowable dose equivalent, or stay time
3. Identify “distance to radiation sources” techniques for minimizing personnel external exposures
4. Using the point source equation (inverse square law), calculate the exposure rate or distance for a point source of radiation
5. Define the unit of *density thickness*
6. Calculate shielding thickness or exposure rates for gamma and x-ray radiation using the equations or by using a computer program

TECH RAD 2.2 Internal Exposure Control

Given the analysis of an incident involving radioactive material, technicians with a radioactive material specialty shall determine the response options needed to minimize internal exposure to radioactive material by completing the following tasks:

1. Define the terms *annual limit on intake* (ALI) and *derived air concentration* (DAC)
2. Define the term reference man
3. Describe three factors that govern the behavior of radioactive materials in the body
4. Explain the two natural mechanisms that reduce the quantity of a radionuclide in the body
5. Explain the relationship of physical, biological, and effective half-lives
6. Given the physical and biological half-lives, calculate the effective half-life
7. Describe methods used to increase the elimination rate of radioactive materials from the body

TECH RAD 2.3 Radiation Survey Instrumentation

Given the analysis of an incident involving radioactive material, technicians with a radioactive material specialty shall be able to determine the correct instrument to use for radiation and contamination monitoring by completing the following tasks:

1. Describe the following features of and specifications for commonly used instruments:
    a. Types of detectors or probes available
    b. Operator-adjustable controls
    c. Specific limitations and characteristics
2. Describe the factors that affect the selection of a portable radiation survey instrument and identify appropriate instruments for external radiation surveys
3. Identify the following features of and specifications for exposure rate instruments:
    a. Types of detectors available for use
    b. Detector shielding and window
    c. Types of radiation detected and measured
    d. Gamma energy response characteristics
    e. Markings for detector effective center
    f. Specific limitations and characteristics
4. List the factors that affect the selection of a portable contamination monitoring instrument
5. Describe the following features of and specifications for commonly used count rate meter probes:
    a. Types of detectors available for use
    b. Detector shielding and window
    c. Types of radiation detected and measured
    d. Gamma energy response characteristics
    e. Specific limitations and characteristics

TECH RAD 3 Implementing the Planned Response

TECH RAD 3.1 Radiological Incidents

Given an analysis of an incident involving radioactive material and the planned response, technicians with a radioactive material specialty shall implement or oversee the response to a given radiological emergency by completing the following tasks:

1. Describe the general response and responsibilities of a specialist during any radiological incident
2. Describe the specialist's response to personnel contamination
3. Describe the specialist's response to off-scale or lost dosimetry

4. Describe the specialist's response to rapidly increasing or unanticipated radiation levels
5. Describe the specialist's response to a radioactive material spill
6. Describe the specialist's response to a fire in a radiological area or involving radioactive materials
7. Identify the available federal responder resources and explain the assistance that each group can provide

TECH RAD 3.2 Contamination Control

Given an analysis of an incident involving radioactive material and the planned response, technicians with a radioactive material specialty shall be able to implement or oversee contamination control techniques to minimize the spread of radiological contamination by completing the following tasks:

1. Define the terms removable and fixed surface contamination, state the difference between them, and explain the common methods used to measure each
2. State the basic principles of contamination control and provide list examples of implementation methods
3. State the purpose of using protective clothing in radiologically contaminated areas
4. Describe the basic factors that determine protective clothing requirements for personnel protection

TECH RAD 3.3 Personnel Decontamination

Given an analysis of an incident involving radioactive material and the planned response, technicians with a radioactive material specialty shall be able to implement or oversee decontamination techniques for equipment and personnel by completing the following tasks:

1. Describe how personnel, personal protective equipment, apparatus, and tools become contaminated with radioactive material
2. State the purpose of radioactive material decontamination
3. Describe field decontamination techniques for equipment
4. Describe the three factors that determine the actions taken in decontamination of personnel
5. Describe methods and techniques for performing personnel decontamination.

Summary: Technician Level Training Guidelines

Audience

These guidelines were developed for Hazardous Materials team members and others at the "technician level" who are designated in response plans as a general resource to perform advanced defensive and offensive operations at a hazardous materials incident.

Prerequisites

Awareness Level Training

Operations Level Training (24 hour program)

Training

The firefighter hazardous materials technician program contains a minimum of 160 hours per Florida Administrative Code, 69A-37.065 Programs of Study and Vocational Courses. OSHA 29 CFR, 1910.120, Hazardous Materials Waste Operations and Emergency Response standard recommends 24 hours for technician training.

The State Emergency Response Commission Training Task Force supports a minimum of 160 hours of initial training for the fire service responders aspiring to engage in technician level countermeasures.

Course instruction should include didactic, skill lab, practical application, and scenario based response training. Full scale exercise where the hazmat responders work under an incident command structure accomplishing risk assessment and implementation of strategies and tactical actions to mitigate a hazardous materials incident should be accomplished.

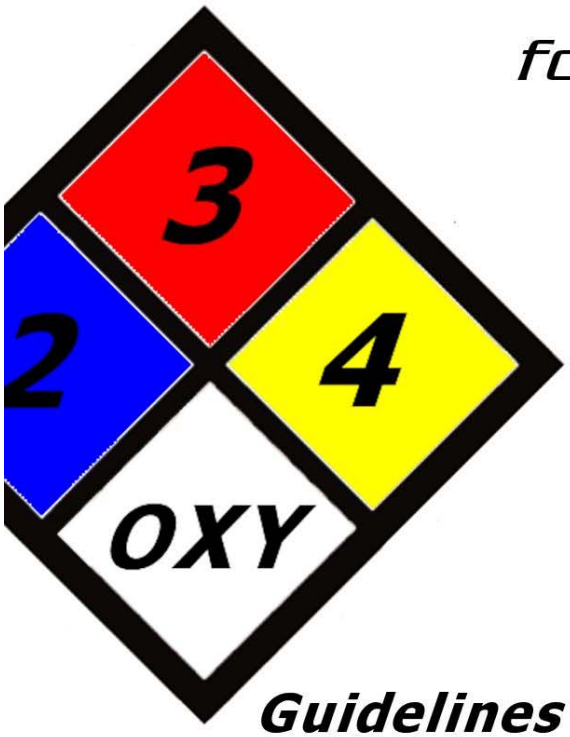
Refresher Training

Refresher training that includes both didactic and hands-on activities is recommended to occur annually and a review and check off of core competencies be performed at this time.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**



Guidelines for Incident Commander Training

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

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Guidelines for Incident Commander Training

Introduction

The incident commander shall be trained to meet all competencies at the awareness level, all core competencies at the operations level, then meet the competencies set forth in this this training guideline.

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illnesses, and disabilities to those who accidently or intentionally encounter an incident.

Definition of an Incident Commander

The incident commander (IC) shall be that person responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources as designated by the authority having jurisdiction.

The incident commander must also meet the requirement identified in OSHA 29 CFR 1910.120(q)(6)(v)(A-F). These include:

1. Know and be able to implement the employer's incident command system.
2. Know how to implement the employer's emergency response plan.
3. Know and understand the hazards and risks associated with employees working in chemical protective clothing.
4. Know how to implement the local emergency response plan.
5. Know of the state emergency response plan and of the Federal Regional Response Team.
6. Know and understand the importance of decontamination procedures.

Goal

The goal of these training guidelines is to provide a format for training so that incident commanders can meet the competencies identified in this standard. Following these guidelines will provide knowledge and skills to perform the defined core competencies safely.

Tasks

In addition to being competent at the awareness and all operations levels, the incident commander 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. Collect and interpret hazard and response information from printed and technical resources, computer databases, and monitoring equipment

    b. Estimate the potential outcomes within the endangered area at a hazardous materials/WMD incident

2. Plan response operations within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:

    a. Identify the response objectives for hazardous materials/WMD incidents

    b. Identify the potential response options (defensive, offensive, and nonintervention) available by response objective

    c. Approve the level of personal protective equipment required for a given action option

    d. Develop an incident action plan, including site safety and control plan, consistent with the emergency response plan or standard operating procedures and within the capability of available personnel, personal protective equipment, and control equipment

3. Implement a response to favorably change the outcome consistent with the emergency response plan or standard operating procedures by completing the following tasks:

    a. Implement an incident command system, including the specified procedures for notification and utilization of nonlocal resources (e.g., private, state, and federal government personnel)

    b. Direct resources (private, governmental, and others) with task assignments and on-scene activities and provide management overview, technical review, and logistical support to those resources

    c. Provide a focal point for information transfer to media and local elected officials through the incident command system structure

4. Evaluate the progress of the planned response to ensure the response objectives are being met safely, effectively, and efficiently and adjust the incident action plan accordingly

5. Terminate the emergency phase of the incident by completing the following tasks:

    a. Transfer command (control) when appropriate

    b. Conduct an incident debriefing

    c. Conduct a multiagency critique

    d. Report and document the hazardous materials/WMD incident and submit the report to the designated entity

Related Standards

- OSHA 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Incident Commander training is recommended to take place in a traditional classroom setting. The training should include table top and functional exercise as well as scenario practice working within an incident command structure.

The incident commander shall become competent in the standards presented in this training guideline and receive any additional training necessary to meet applicable governmental response and occupational health and safety regulations. In addition, the incident commander shall receive any additional training necessary to meet specific needs of the jurisdiction.

It is recommended that the individual delivering this training program possess a working knowledge of the incident command system, competency at both the Awareness and Operations level, and have knowledge and competence in providing adult instructional techniques.

Acronyms

AHJ – Authority Having Jurisdiction

CMP – Counts per minute

JIC – Joint Information Center

LC50 – Lethal Concentration 50.

LD50 – Lethal Dose 50

Mrem – Millirem

NIMS – National Incident Management System

PEL – Permissible Exposure Limit

Ppm – parts per million

REM – Roentgen Equivalent Man

SDS – Safety Data Sheet

TLV-STEL – Threshold Limit Value – Short Term Exposure Limit

TLV-TWA – Threshold Limit Value – Time Weighted Average

IC 1 Analyzing the Incident

IC 1.1 Collecting and Interpreting Hazard and Response Information

IC 1.1.1 Given access to printed and technical resources, computer databases, and monitoring equipment, the incident commander shall ensure the collection and interpretation of hazard and response information not available from the current edition of the DOT *Emergency Response Guidebook* or an SDS.

IC 1.1.2 Given access to printed and technical resources, computer databases, and monitoring equipment, the incident commander shall be able to 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
5. Technical information specialists

IC 1.2 Estimating Potential Outcomes

Given scenarios involving hazardous materials/WMD incidents, the surrounding conditions, and the predicted behavior of the container and its contents, the incident commander shall estimate the potential outcomes within the endangered area and shall complete the following tasks:

IC 1.2.1 Identify the steps for estimating the outcomes within an endangered area of a hazardous materials/WMD incident

IC 1.2.2 Describe the following toxicological terms and exposure values and explain their significance in the analysis process:

1. Counts per minute (cpm) and kilo counts per minute (kcpm)
2. Immediately dangerous to life and health (IDLH) value
3. Infectious dose
4. Lethal concentrations (LC50)
5. Lethal dose (LD50)
6. Parts per billion (ppb)
7. Parts per million (ppm)
8. Permissible exposure limit (PEL)
9. Radiation absorbed dose (rad)
10. Roentgen equivalent man (rem), millirem (mrem), microrem (µrem)

11. Threshold limit value ceiling (TLV-C)
12. Threshold limit value short-term exposure limit (TLV-STEL)
13. Threshold limit value time-weighted average (TLV-TWA)
14. Other toxicological terms or exposure values as determined by the AHJ

IC 1.2.3 Identify two methods for predicting the areas of potential harm within the endangered area of a hazardous materials/WMD incident

IC 1.2.4 Identify the methods available to the organization for obtaining local weather conditions and predictions for short-term future weather changes

IC 1.2.5 Explain the basic toxicological principles relative to assessment and treatment of personnel exposed to hazardous materials, including the following:

1. Acute and delayed toxicity (chronic)
2. Dose response
3. Local and systemic effects
4. Routes of exposure
5. Synergistic effects

IC 1.2.6 Describe the health risks associated with the following:

1. Biological agents and biological toxins
2. Blood agents
3. Choking agents
4. Irritants (riot control agents)
5. Nerve agents
6. Radiological materials
7. Vesicants (blister agents)

IC 2 Planning the Response

IC 2.1 Identifying Response Objectives

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

IC 2.2 Identifying the Potential Response Options

Given scenarios involving hazardous materials/WMD, the incident commander shall identify the possible response options (defensive, offensive, and

nonintervention) by response objective for each problem and shall complete the following tasks:

1. Identify the possible response options to accomplish a given response objective.
2. Identify the purpose of each of the following techniques for hazardous materials control:
    a. Absorption
    b. Adsorption
    c. Blanketing
    d. Covering
    e. Contamination isolation
    f. Damming
    g. Diking
    h. Dilution
    i. Dispersion
    j. Diversion
    k. Fire suppression
    l. Neutralization
    m. Over-packing
    n. Patching
    o. Plugging
    p. Pressure isolation and reduction (flaring; venting; vent and burn; isolation of valves, pumps, or energy sources)
    q. Retention
    r. Solidification
    s. Transfer
    t. Vapor control (dispersion, suppression)

IC 2.3 Approving the Level of Personal Protective Equipment

Given scenarios involving hazardous materials/WMD with known and unknown hazardous materials/WMD, the incident commander shall approve the personal protective equipment for the response options specified in the incident action plan in each situation and shall complete the following tasks:

1. Identify the four levels of chemical protection (EPA/OSHA) and describe the equipment required for each level and the conditions under which each level is used

2. Describe the following terms and explain their impact and significance on the selection of chemical-protective clothing:
    a. Degradation
    b. Penetration
    c. Permeation
3. Describe three safety considerations for personnel working in vapor-protective, liquid splash–protective, and high temperature–protective clothing
4. Identify the physiological and psychological stresses that can affect users of personal protective equipment

IC 2.4 Developing an Incident Action Plan

Given scenarios involving hazardous materials/WMD incidents, the incident commander shall develop an incident action plan, including 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, and shall complete following tasks.

IC 2.4.1 The incident commander shall identify the steps for developing an incident action plan.

IC 2.4.2 The incident commander shall identify the factors to be evaluated in selecting public protective actions, including evacuation and sheltering-in-place.

IC 2.4.3 Given the emergency response plan or standard operating procedures, the incident commander shall identify which entity will perform the following:

1. Receive the initial notification
2. Provide secondary notification and activation of response agencies
3. Make ongoing assessments of the situation
4. Command on-scene personnel (incident management system)
5. Coordinate support and mutual aid
6. Provide law enforcement and on-scene security (crowd control)
7. Provide traffic control and rerouting
8. Provide resources for public safety protective action (evacuation or shelter in-place)
9. Provide fire suppression services
10. Provide on-scene medical assistance (ambulance) and medical treatment (hospital)
11. Provide public notification (warning)
12. Provide public information (news media statements)

13. Provide on-scene communications support
14. Provide emergency on-scene decontamination
15. Provide operations-level hazard control services
16. Provide technician-level hazard mitigation services
17. Provide environmental remedial action (cleanup) services
18. Provide environmental monitoring
19. Implement on-site accountability
20. Provide on-site responder identification
21. Provide incident command post security
22. Provide incident or crime scene investigation
23. Provide evidence collection and sampling

IC 2.4.4 The incident commander shall identify the process for determining the effectiveness of a response option based on the potential outcomes.

IC 2.4.5 The incident commander shall identify the safe operating practices and procedures that are required to be followed at a hazardous materials/WMD incident.

IC 2.4.6 The incident commander shall identify the importance of pre-incident planning relating to safety during responses to specific sites.

IC 2.4.7 The incident commander shall identify the procedures for presenting a safety briefing prior to allowing personnel to work on a hazardous materials/WMD incident.

IC 2.4.8 The incident commander shall identify at least three safety precautions associated with search and rescue missions at hazardous materials/WMD incidents.

IC 2.4.9 The incident commander shall identify the advantages and limitations of the following and describe an example where each decontamination method would be used:

1. Absorption
2. Adsorption
3. Chemical degradation
4. Dilution
5. Disinfection
6. Evaporation
7. Isolation and disposal
8. Neutralization
9. Solidification
10. Sterilization
11. Vacuuming
12. Washing

IC 2.4.10 The incident commander shall identify the atmospheric and physical safety hazards associated with hazardous materials/WMD incidents involving confined spaces.

IC 3 Implementing the Planned Response

IC 3.1 Implementing an Incident Command System

Given a copy of the emergency response plan and annexes related to hazardous materials/WMD, the incident commander shall identify the requirements of the plan, including the procedures for notification and utilization of nonlocal resources (private, state, and federal government personnel), by completing the following requirements:

IC 3. 1.1 Identify the role of the command element during a hazardous materials/WMD incident

IC 3. 1.2 Describe the concept of unified command and its application and use at a hazardous materials/WMD incident

IC 3.1.3 Identify the duties and responsibilities of the following hazardous materials branch/group functions within the incident command system:

1. Decontamination
2. Entry (backup)
3. Hazardous materials branch director or group supervisor
4. Hazardous materials safety
5. Information and research

IC 3. 1.4 Identify the steps for implementing the emergency response plans required under Title III Emergency Planning and Community Right-to-Know Act (EPCRA) of the Superfund Amendments and Reauthorization Act (SARA) Section 303, or other state and emergency response planning legislation

IC 3. 1.5 Given the emergency response planning documents, identify the elements of each of the documents.

IC 3. 1.6 Identify the elements of the incident management system/incident command system (IMS/ICS) necessary to coordinate response activities at hazardous materials/WMD incidents

IC 3.1.7 Identify the primary government agencies and identify the scope of their regulatory authority (including the regulations) pertaining to the production, transportation, storage, and use of hazardous materials and the disposal of hazardous wastes

IC 3. 1.8 Identify the governmental agencies and resources that can offer assistance during a hazardous materials/WMD incident and identify their role and the type of assistance or resources that might be available

IC 3.2 Directing Resources (Private and Governmental)

Given a scenario involving a hazardous materials/WMD incident and the necessary resources to implement the planned response, the incident commander shall demonstrate the ability to direct the resources in a safe and efficient manner consistent with the capabilities of those resources.

IC 3.3 Providing a Focal Point for Information Transfer to the Media and Elected Officials

Given a scenario involving a hazardous materials/WMD incident, the incident commander shall identify information to be provided to the media and local, state, and federal officials and shall complete the following tasks:

IC 3. 3.1 Identify the local policy for providing information to the media

IC 3. 3.2 Identify the responsibilities of the public information officer and the liaison officer at a hazardous materials/WMD incident

IC 3. 3.3 Describe the concept of a joint information center (JIC) and its application and use at a hazardous materials/WMD incident

IC 4 Evaluating Progress

IC 4.1 Evaluating Progress of the Incident Action Plan

Given scenarios involving hazardous materials/WMD incidents, the incident commander shall evaluate the progress of the incident action plan to determine whether the efforts are accomplishing the response objectives and shall complete the following tasks:

IC 4.1.1 Identify the procedures for evaluating whether the response options are effective in accomplishing the objectives

IC 4.1.2 Identify the steps for comparing actual behavior of the material and the container to that predicted in the analysis process

IC 4.1.3 Determine the effectiveness of the following:

1. Control, containment, or confinement operations
2. Decontamination process
3. Established control zones

4. Personnel being used
5. Personal protective equipment

IC 4.1.4 Make modifications to the incident action plan as necessary

IC 4.2 Transferring Command and Control both, During the Response Phase and the Post-Response Phase

Given a scenario involving a hazardous materials/WMD incident, the emergency response plan, and standard operating procedures, the incident commander shall be able to identify the steps to be taken to transfer command and control of the incident.

IC 5 Terminating the Incident

IC 5.1 Terminating Response Operations

Given a scenario involving a hazardous materials/WMD incident in which the incident action plan objectives have been achieved, the hazardous materials incident commander shall describe the steps taken to terminate the incident consistent with the emergency response plan and/or standard operating procedures and shall complete the following tasks:

IC 5.1.1 Identify the steps required for terminating the hazardous materials/WMD incident

IC 5.1.2 Identify the procedures for conducting incident debriefings at a hazardous materials/WMD incident

IC 5.2 Conducting a Debriefing

Given scenarios involving a hazardous materials/WMD incident, the incident commander shall conduct a debriefing of the incident and shall complete the following tasks:

1. Describe three components of an effective debriefing
2. Describe the key topics in an effective debriefing
3. Describe when a debriefing should take place
4. Describe who should be involved in a debriefing
5. Identify the procedures for conducting incident debriefings at a hazardous materials/WMD incident

IC 5.3 Conducting a Critique

Given details of a scenario involving a multiagency hazardous materials/WMD incident, the incident commander shall conduct a critique of 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 what written documents should be prepared as a result of the critique
5. Implement the procedure for conducting a critique of the incident

IC 5.4 Reporting and Documenting the Hazardous Materials/WMD Incident

Given a scenario involving a hazardous materials/WMD incident, the incident commander shall demonstrate the ability to report and document the incident consistent with local, state, and federal requirements and shall complete the following tasks:

IC 5.4.1 Identify the reporting requirements of the federal, state, and local agencies

IC 5.4.2 Identify the importance of the documentation for a hazardous materials/WMD incident, including training records, exposure records, incident reports, and critique reports

IC 5.4.3 Identify the steps in keeping an activity log and exposure records for hazardous materials/WMD incidents

IC 5.4.4 Identify the requirements for compiling hazardous materials/WMD incident reports found in the emergency response plan or standard operating procedures

IC 5.4.5 Identify the requirements for filing documents and maintaining records found in the emergency response plan or standard operating procedures

IC 5.4.6 Identify the procedures required for legal documentation and chain of custody and continuity described in the standard operating procedures or the emergency response plan

Guidelines for Hazardous Materials Officers Training

Introduction

The hazardous materials officer shall be trained to meet all competencies at the awareness level, all core competencies at the operations level, then meet the competencies set forth in this this training guideline.

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who respond to hazardous materials/WMD incidents and necessary for a risk=based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illnesses, and disabilities to those who accidently or intentionally encounter an incident.

Definition of a Hazardous Material Officer

The hazardous materials officer (NIMS: Hazardous Materials Branch Director/Group Supervisor) shall be that person who is responsible for directing and coordinating all operations involving hazardous materials/WMD as assigned by the incident commander.

Goal

The goal of these training guidelines is to provide a format for training so that hazardous materials officer can meet the competencies identified in this standard. Following these guidelines will provide knowledge and skills to perform the defined core competencies safely.

Tasks

When responding to hazardous materials/WMD incidents, the hazardous materials officer shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the complexity of the problem by estimating the potential outcomes within the endangered area

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

    a. Identify the response objectives (defensive, offensive, and nonintervention) for hazardous materials/WMD incidents

    b. Identify the potential response options (defensive, offensive, and nonintervention) available by response objective

    c. Determine the level of personal protective equipment required for a given action option

    d. Provide recommendations to the incident commander for the development of an incident action plan for the hazardous materials branch/group consistent with the emergency

response plan and/or standard operating procedures and within the capability of available personnel, personal protective equipment, and control equipment

3. Implement a response to favorably change the outcomes consistent with the emergency response plan and/or standard operating procedures by completing the following tasks:

    a. Implement the functions within the incident command system as they directly relate to the specified procedures for hazardous materials branch/group operations

    b. Direct hazardous materials branch/group resources (private, governmental, and others) with task assignments and on-scene activities and provide management overviews, technical review, and logistical support to hazardous materials branch/group resources

4. Evaluate the progress of the planned response to ensure that the response objectives are effective, and adjust the incident action plan accordingly

5. Terminate the incident by completing the following:

    a. Conduct a debriefing for hazardous materials branch/group personnel

    b. Conduct a critique for hazardous materials branch/group personnel

    c. Report and document the hazardous materials branch/group operations

Related Standards

- OSHA 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

The hazardous materials officer shall be trained to meet all competencies at the awareness level, all core competencies at the operations, all competencies at the technician level, and all competencies of this chapter.

Hazardous materials officers shall also receive training to meet governmental response and occupational health and safety regulations.

The hazardous materials officer shall become competent in the standards presented in this training guideline document but, also shall receive any additional training necessary to meet applicable governmental response and occupational health and safety regulations. In addition, the incident commander shall receive any additional training necessary to meet specific needs of the jurisdiction.

It is recommended that the individual delivering this training program demonstrate competency at both the Awareness and Operations level and have knowledge and competence in providing adult instructional techniques.

HM CO 1 Analyzing the Incident

Given scenarios involving hazardous materials/WMD incidents, including the surrounding conditions and the predicted behavior of the container and its contents, the hazardous materials officer shall estimate the potential outcomes within the endangered area.

HM CO 1.1 Planning the Response

HM CO 1.1.1 Given a scenario involving a hazardous materials/WMD incident, the hazardous materials officer shall identify the response objectives (defensive, offensive, and nonintervention) for each incident.

HM CO1.1.2 Given a scenario involving hazardous materials/WMD incidents, the hazardous materials officer shall identify the potential response options (defensive, offensive, and nonintervention) for each incident.

HM CO 1.2 Selecting the Level of Personal Protective Equipment

Given scenarios involving hazardous materials/WMD incidents with known and unknown hazardous materials/WMD, the hazardous materials officer shall select the personal protective equipment for the response options specified in the incident action plan in each situation.

HM CO 1.3 Developing a Plan of Action

Given scenarios involving hazardous materials/WMD incidents, the hazardous materials officer shall develop a plan of action consistent with the emergency response plan and/or standard operating procedures that is within the capability of the available personnel, personal protective equipment, and control equipment and shall complete the following tasks:

1. Identify the order of the steps for developing the plan of action
2. Identify the factors to be evaluated in selecting public protective actions, including evacuation and shelter-in-place
3. Given the emergency response plan and/or standard operating procedures, identify procedures to accomplish the following tasks:
    a. Make ongoing assessments of the situation
    b. Coordinate on-scene personnel assigned to the hazardous materials branch/group
    c. Coordinate hazardous materials/WMD support and mutual aid
    d. Coordinate public protective actions (evacuation or shelter-in-place)
    e. Coordinate with fire suppression services as they relate to hazardous materials/WMD incidents
    f. Coordinate control, containment, and confinement operations

g. Coordinate with the medical branch to ensure medical assistance (ambulance) and medical treatment (hospital)

h. Coordinate on-scene decontamination

i. Coordinate activities with those of the environmental remediation (cleanup) services

j. Coordinate evidence preservation and sampling in a contaminated environment

4. Identify the process for determining the effectiveness of an action option on the potential outcomes
5. Identify the procedures for presenting a safety briefing prior to allowing personnel to work on a hazardous materials/WMD incident

HM CO 2 Implementing the Planned Response

HM CO 2.1 Implementing the Functions in the Incident Management System

Given a copy of the emergency response plan, the hazardous materials officer shall identify the requirements of the plan, including the required procedures for notification and utilization of nonlocal resources (private, state, and federal government personnel), and shall complete the following tasks:

1. Identify the process and procedures for obtaining cleanup and remediation services in the emergency response plan and/or standard operating procedures
2. Identify the steps for implementing the emergency response plans as required under SARA Title III Section 303 of the federal regulations or other emergency response planning legislation
3. Given the local emergency planning documents, identify the elements of each of the documents
4. Identify the elements of the local incident management system necessary to coordinate response activities at hazardous materials/WMD incidents
5. Identify the primary local, state, regional, and federal government agencies and identify the scope of their regulatory authority (including the regulations) pertaining to the production, transportation, storage, and use of hazardous materials/WMD and the disposal of hazardous wastes
6. Identify the governmental agencies and resources offering assistance to the hazardous materials branch/group during a hazardous materials/WMD incident and identify their role and the type of assistance or resources available
7. Identify the governmental agencies and resources offering assistance during a hazardous materials incident involving criminal or terrorist activities and identify their role and the type of assistance or resources available

HM CO 2.1.2 Directing Resources (Private and Governmental)

Given a scenario involving a hazardous materials/WMD incident and the necessary resources to implement the planned response, the hazardous materials officer shall demonstrate the ability to direct the hazardous materials branch/group resources in a safe and efficient manner consistent with the capabilities of those resources.

HM CO 2.1.3 Providing a Focal Point for Information Transfer to Media and Elected Officials.

Given a scenario involving a hazardous materials/WMD incident, the hazardous materials officer shall demonstrate the ability to act as a resource to provide information to the command element, the public information officer, or the liaison officer for distribution to the media and local, state, and federal officials and shall complete the following tasks:

1. 1. Identify the local policy for providing information to the media
2. 2. Identify the responsibilities of the public information officer at a hazardous materials/WMD incident

HM CO 3 Evaluating Progress

Given scenarios involving hazardous materials/WMD incidents, the hazardous materials officer shall evaluate the progress of the incident action plan to determine whether the efforts are accomplishing the response objectives and shall complete the following tasks:

1. Identify the procedures for evaluating whether the response options are effective in accomplishing the objectives
2. Identify the steps for comparing actual behavior of the material and the container to that predicted in the analysis process
3. Determine the effectiveness of the following:
   a. Personnel being used
   b. Control zones
   c. Personal protective equipment
   d. Control, containment, and confinement operations
   e. Decontamination
4. Make appropriate modifications to the incident action plan

HM CO 4 Terminating the Incident

HM CO 4.1 Terminating the Emergency Phase of the Incident

Given a scenario involving a hazardous materials/WMD incident in which the incident action plan objectives have been achieved, the hazardous materials officer shall describe the steps necessary to terminate the emergency phase of the incident consistent with the emergency response plan and/or standard operating procedures and shall complete the following tasks:

1. Describe the steps required for terminating the emergency phase of a hazardous materials/WMD incident
2. Describe the procedures for conducting incident debriefings at a hazardous materials/WMD incident

HM CO 4.2 Conducting a Debriefing

Given a scenario involving a hazardous materials/WMD incident, the hazardous materials officer shall demonstrate the ability to conduct a debriefing of the incident for all units assigned to the hazardous materials branch/group and shall complete the following tasks:

1. Describe three components of an effective debriefing
2. Describe the key topics in an effective debriefing
3. Describe when a debriefing should take place
4. Describe who should be involved in a debriefing
5. Identify the procedures for conducting incident debriefings at a hazardous materials/WMD incident

HM CO 4.3 Conducting a Critique

Given the details of a scenario involving a hazardous materials/WMD incident, the hazardous materials officer shall demonstrate the ability to conduct a critique of the incident for all units assigned to the hazardous materials branch/group 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 what written documents should be prepared as a result of the critique
5. Identify the procedure for conducting a critique of the incident
6. Identify the requirements for conducting a post-incident analysis as defined in the emergency response plan, standard operating procedures, or local, state, and federal regulations

HM CO 4.4 Reporting and Documenting the Incident

Given an example of a hazardous materials/WMD incident, the hazardous materials officer shall demonstrate the ability to report and document the incident consistent with the local, state, and federal requirements and shall complete the following tasks:

1. Identify the reporting requirements of federal, state, and local agencies
2. Identify the importance of documentation for a hazardous materials/WMD incident, including training records, exposure records, incident reports, and critique reports
3. Identify the steps in keeping an activity log and exposure records for hazardous materials/WMD incidents
4. Identify the requirements found in the emergency response plan and/or standard operating procedures for compiling hazardous materials/WMD incident reports
5. Identify the requirements for filing documents and maintaining records as defined in the emergency response plan and/or standard operating procedures
6. Identify the procedures required for legal documentation and chain of custody/continuity described in the emergency response plan and/or standard operating procedures

Summary: Incident Commander Training Guidelines

Audience

These guidelines were developed for the Incident Commander who is responsible for all incident activities including the development of the strategies and tactics ensuring that the required resources are identified and ordered.

Prerequisites

Awareness Level Training

Operations Level Training (24 hour program)

Training

To be adequately trained as a hazardous materials incident commander the trainee must first attend and meet the requirements of both Awareness and Operations levels. In addition the following competencies must be met:

- Knowledge of the role of incident commander within the Incident Command System.
- Knowledge of local, state, and federal emergency response plans.
- Ability to manage and coordinate a hazmat incident response, including supervising hazard and risk assessment, coordinating control, containment, and confinement operations, ensuring proper use of personal protective equipment, employing proper notification procedures and ensuring correct decontamination procedures.
- The ability to implement transfer of command and incident termination procedures.

It is recommended that the course includes both didactic, lab instruction, practical application, scenario and response based training including a simulated full scale exercise where the hazmat responders work under an incident command structure.

Refresher Training

Refresher training that includes both didactic and hands-on activities is recommended to occur annually and a review and check off of core competencies be performed at this time.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**

Guidelines for Firefighters Hazardous Materials Training

(Awareness & Operations training guidelines)

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

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Guidelines for Firefighters Hazardous Materials Training

Introduction

Firefighters shall first be trained to the Awareness Level then be trained to the requirements of the Operational level as defined in OSHA 29 CFR 1910.120, Hazardous Materials Waste Operations and Emergency Response, and NFPA 472, Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 edition. In addition firefighters in Florida must also meet Florida Statute 69A-37.065 Programs of Study and Vocational Courses.

Purpose

The purpose of these training guidelines is to specify minimum competencies required for firefighters who encounter or respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illness, and disabilities to those who accidently or intentionally encounter an incident.

It shall not be the intention of these guidelines to restrict any jurisdiction from exceeding these minimum requirements.

Definition of Firefighter Hazardous Materials Operations Trained Personnel

Firefighters who respond to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

In addition, Firefighter Personnel are required to have:

Awareness Level

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify the hazardous substances, if possible.
- An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
- The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

Operations Level

- Knowledge of the basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment provided to the first responder operational level.
- An understanding of basic hazardous materials terms.
- Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
- Know how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

Goal

The goal of these guidelines is to make available a format for firefighter hazardous materials training that includes both awareness and operations level responder training. Following these guidelines will highlight the knowledge and skills necessary to perform the defined core competencies safely.

Tasks

When responding to hazardous materials/WMD incidents, firefighter shall be able to perform the following tasks:

Awareness 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 and response 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.

    a. Initiate protective actions.

    b. Initiate the notification process.

Operations Tasks

3. 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

4. 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

5. 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

6. 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

Related Standards/Documents

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.
- EPA 40 CFR 3 Worker Protection
- Florida Statute 69A-37.065 Programs of Study and Vocational Courses.

Training Methodology Recommendations

Firefighter hazardous materials Awareness and Operations Level training is recommended to take place in a traditional classroom setting and include opportunities for field study and application. This training may be incorporated into the firefighter standards program but must be taught as a consecutive topic during the program. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, large and small exercise groups, and a field activity that will include working within an incident command structure.

As identified in Florida Statute 69A-37.065 Programs of Study and Vocational Courses, firefighter Hazardous Materials Operations course shall consist of not less than 24 hours of training. An instructor providing training under this section must be qualified by the Bureau. All instructors shall submit an Instructor Approval Request Form and be approved by the Bureau prior to the first day of the course. Qualified instructors are:

1. Instructors with requisite faculty credentials for the academic institution that is registered in the Florida Department of Education Statewide Course Numbering System to teach the course; or

2. Instructors with requisite faculty credentials as determined by the United States Fire Administration – National Fire Academy; or

3. Instructors with requisite faculty credentials as determined by the respective regionally accredited or nationally accredited university or college; or

4. Instructors who hold an active Single Course Exemption Certification issued by the Division as outlined in subsection 69A-37.059(4), F.A.C.; or

5. Instructors who have completed the required courses under this section which is recorded in the Bureau's database. These instructors are known as Adjunct Instructors and are approved to teach courses under the supervision of a Lead Instructor; or,

6. Instructors who have completed the required courses under this section, and, have previously taught this course as an Adjunct Instructor which was recorded in the Bureau's database. These instructors are known as Lead Instructors.

Acronyms

AFFF – Aqueous Film-forming Foam

AHJ – Authority Having Jurisdiction

APR – Air Purifying Respirator

CHEMTREC – Chemical Transportation Emergency Center

CANUTEC – Canadian Transport Emergency Center

DOT – Department of Transportation

EOD – Explosive Ordinance Disposal

FBI – Federal Bureau of Investigation

HME – Homemade Explosive

ICS – Incident Command System

IED – Improvised Explosive Devices

MC – Motor Carrier

MSDS – Materials Safety Data Sheet (now Safety Data Sheets)

NBSCAB – National Bomb Squad Commander Advisory Board

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Association

PAPR – Powered Air Purifying Respirator

PCP – Pest Control Product

PPE – Personal Protective Equipment

SCBA – Self Contained Breathing Apparatus

SDS – Safety Data Sheet

SETIQ – Sistema de Emergencia para la Transportacion de la Industria Quimca (Transportation for Chemical Industry, Mexico)

UN/NA – United Nations/North America

UN/DOT – United Nations/Department of Transportation

VOC – Volatile Organic Compounds

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of operations level personnel.

AWARENESS TRAINING GUIDELINES

AWARE 1 Analyzing the Incident

AWARE 1.1 Detecting the Presence of Hazardous Materials/WMD

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

1. Definitions of both hazardous material (or dangerous goods, in Canada) and WMD
2. UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division.
3. The Determine the hazards associated with each hazard class and division.
4. Difference between hazardous materials/WMD incidents and other emergencies
5. Occupancies and locations in the community where hazardous materials/WMD found
6. Container shapes that can indicate the presence of hazardous materials/WMD
7. Facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
    a. Transportation markings
    b. NFPA 704
    c. Military hazardous materials/WMD markings
    d. Special hazard communication markings

e. Pipeline markings

f. Container markings

8. NFPA 704 marking and describe the significance of the colors, numbers, and special symbols
9. U.S. and Canadian placards and labels that indicate hazardous materials/WMD
10. Basic information on material safety data sheets (MSDS) and shipping papers for hazardous materials including the location and sections in each.
11. Other clues to include sight, sound, and odor and the limitations of using the senses in determining the presence or absence of hazardous materials/WMD
12. Types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD
13. The difference between a chemical and a biological incident
14. Indicators of possible criminal or terrorist activity involving chemical agents, biological agents, radiologic agents, illicit laboratories (clandestine laboratories, weapons lab, ricin lab) explosives, and secondary devices.

AWARE 1.2 Surveying Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incidents, 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, identify:

1. Difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in transportation
2. Sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation
3. Sources for obtaining the names of hazardous materials/WMD at a facility

AWARE 1.3 Collecting Hazard Information

Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), 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 identify:

1. Methods for determining the guidebook page for a hazardous material/WMD
2. General types of hazards found on each guidebook page

AWARE 2 Implementing the Planned Response

AWARE 2.1 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,* identify the actions to be taken to protect themselves and others and to control access to the scene by completing the following requirements, identify:

1. The location of both the emergency response plan and/or standard operating procedures
2. The role of the awareness level personnel during hazardous materials/WMD incidents, including precautions taken to protect themselves, others, and providing emergency medical care to victims of hazardous materials/WMD incidents.
3. The following basic precautions to be taken to protect themselves and others in hazardous materials/WMD incidents, identify:
    a. The precautions necessary when providing emergency medical care to victims of hazardous materials/WMD incidents
    b. Typical ignition sources found at the scene of hazardous materials/WMD incidents
    c. Ways hazardous materials/WMD are harmful to people, the environment, and property
    d. 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

AWARE 2.2 Initiating the Notification Process

Given scenarios involving hazardous materials/WMD incidents, identify the initial notifications to be made and how to make them, consistent with the AHJ.

OPERATIONS TRAINING GUIDELINES

OPS 1 Analyzing the Incident.

OPS 1.1 Surveying Hazardous Materials/WMD Incidents

Given scenarios involving hazardous materials/WMD incidents collect information about the incident to identify the containers, the materials involved, the surrounding conditions, and whether hazardous materials/WMD have been released.

OPS 1.1.1 Given three examples each of liquid, gas, and solid hazardous material or WMD, including various hazard classes identify the general shapes of containers in which the hazardous materials/WMD are typically found.

Given examples of the following tank cars 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

Given examples of the following intermodal tanks identify each intermodal tank by type, as follows:

1. Non-pressure intermodal tanks
2. Pressure intermodal tanks
3. Specialized intermodal tanks, including Cryogenic intermodal tanks and Tube modules

Given examples of the following cargo tanks 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

Given examples of the following storage tanks identify each tank by type, as follows:

1. Cryogenic liquid tank
2. Non-pressure tank
3. Pressure tank

Given examples of the following non-bulk packaging identify each package by type, as follows:

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

Given examples of the following packaging identify the characteristics of each Intermediate bulk container (IBC) and ton container.

Given examples of the following radioactive material packages 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

OPS 1.1.2 Given examples of containers identify the markings that differentiate one container from another.

Given examples of the following marked transport vehicles and their corresponding shipping papers 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

Given examples of facility containers identify the markings indicating container size, product contained, and/or site identification numbers.

OPS 1.1.3 Given examples of hazardous materials incidents identify the name(s) of the hazardous material(s).

Identify the following information on a pipeline marker:

1. Emergency telephone number
2. Owner
3. Product

Given a pesticide label 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

Given a label for a radioactive material identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable.

OPS 1.1.4 Identify and list the surrounding conditions that should be noted when a hazardous materials/WMD incident is surveyed.

OPS 1.1.5 Describe ways to verify information obtained from the survey of a hazardous materials/WMD incident.

OPS 1.1.6 Identify at least three additional hazards that could be associated with an incident involving terrorist or criminal activities.

OPS 1.2 Collecting Hazard and Response Information

OPS 1.2.1 Given scenarios involving known hazardous materials/WMD collect hazard and response information using MSDS, CHEMTREC/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/SDS in an emergency
3. Using an MSDS/SDS 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

OPS 1.3 Predicting the Likely Behavior of a Material and Its Container

OPS 1.3.1 Given scenarios involving hazardous materials/WMD incidents, each with a single hazardous material/WMD 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 range
        v. Flash point
        vi. Particle size
        vii. Persistence
        viii. Physical state
        ix. Specific gravity
        x. Toxic products of combustion
        xi. Vapor density
        xii. Vapor pressure
        xiii. Water solubility
        xiv. (Auto) Ignition temperature
        xv. Radiation (ionizing and non-ionizing)
    b. Identify the differences between the following terms:

i. Contamination & secondary contamination
ii. Exposure & contamination
iii. Exposure & hazard
iv. Infectious & contagious
v. Acute effects & chronic effects
vi. Acute & 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. Toxic
    i. Sensitizer, allergen
    j. Target organ effects
9. Given the following, identify the corresponding UN/DOT hazard class and division:
    a. Blood agents
    b. Choking agents
    c. Irritants (riot control agents)
    d. Nerve agents
    e. Radiological materials
    f. Vesicants (blister agents)
    g. Biological agents and biological toxins

OPS 1.4 Estimating Potential Harm

OPS 1.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 2 Planning the Response

OPS 2.1 Describing Response Objectives

OPS 2.1.1 Given at least two scenarios involving hazardous materials/WMD incidents 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 protected with 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

OPS 2.2 Identifying Action Options

OPS 2.2.1 Given examples of hazardous materials/WMD incidents (facility and transportation 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

OPS 2.3 Determining Suitability of Personal Protective Equipment

OPS 2.3.1 Given examples of hazardous materials/WMD incidents, including the names of the hazardous materials/WMD involved and the anticipated type of exposure 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

OPS 2.4 Identifying Decontamination Issues

OPS 2.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 3 Implementing the Planned Response

OPS 3.1 Establishing Scene Control

OPS 3.1.1 Given two scenarios involving hazardous materials/WMD incidents explain how to establish and maintain scene control, including control zones and emergency decontamination, 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 either a Hazardous material incidents or a Hazardous materials/WMD incidents involving criminal activities
6. Identify the procedures for ensuring coordinated communication between responders and to the public

OPS 3.2 Preserving Evidence

OPS 3.2.1 Given two scenarios involving hazardous materials/WMD incidents describe the process to preserve evidence as listed in the emergency response plan and/or standard operating procedures.

OPS 3.3 Initiating the Incident Command System

OPS 3.3.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 3.4 Using Personal Protective Equipment

OPS 3.4.1 Given the personal protective equipment provided by the AHJ 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

OPS 4 Evaluating Progress

OPS 4.1 Evaluating the Status of Planned Response

OPS 4.1.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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

OPS 4.2 Communicating the Status of Planned Response

OPS 4.2.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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.

Summary: Firefighter Awareness – Operations Training Guidelines

Audience

These guidelines were developed for all Florida firefighters. These guidelines provide an outline of the required core competencies for firefighters who participate in operations at a hazardous materials incident

Prerequisites

Awareness level training is required prior to the completion of the Operations level.

Training

Firefighter hazardous materials Awareness and Operations Level training is recommended to take place in a traditional classroom setting and include opportunities for field study and application. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, large and small exercise groups, and a field activity that will include working within an incident command structure.

The competencies found in these guidelines include:

- An understanding of hazardous materials terms, basic hazard and risk assessment, and the role of the Firefighter at a hazardous materials incident.
- The ability to perform basic control. Containment and/or confinement techniques with proper use of personal protective equipment and following standard operating procedures.
- The ability to implement basic decontamination procedures.

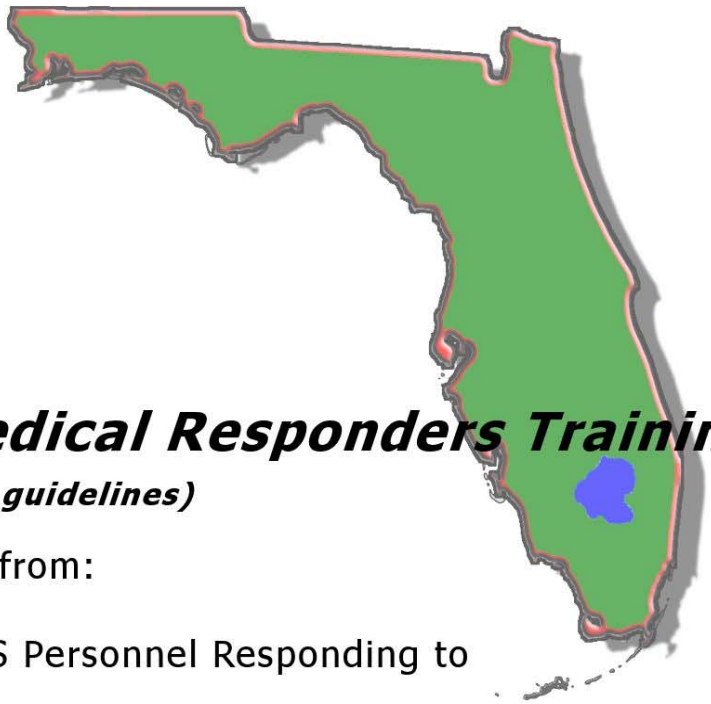
Refresher Training

Refresher training is recommended to occur annually.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**



Guidelines for EMS / Medical Responders Training

(includes BLS & ALS guidelines)

Developed from:

NFPA 473 Competencies for EMS Personnel Responding to

Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

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Guidelines for Hazardous Materials/WMD Basic Life Support (BLS) Responder Training

Introduction

All emergency medical services (EMS) personnel at the hazardous materials/WMD basic life support (BLS) responder level, in addition to their BLS certification, shall be trained to meet at least the core competencies of the operations level responders as defined in NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents (2013 edition)*, and all competencies of these training guidelines taken from NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents (2013 edition).*

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illnesses, and disabilities to those who accidently or intentionally encounter an incident.

Definition of Hazardous Materials/WMD Basic Life Support Responder

In addition to their BLS certification, operations level responders who are assigned EMS mission-specific responsibilities at hazardous materials/WMD incidents shall be trained to meet all competencies of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, Chapters 4 and 5, and all competencies for the assigned responsibilities in NFPA 473, Chapter 4.

Goal

The goal of these guidelines at the BLS responder level shall be to provide the individual with the knowledge and skills necessary to safely deliver BLS at hazardous materials/WMD incidents and to work within an established IMS/ICS.

Tasks

In addition to being competent at the operations level, the Hazardous Materials/WMD BLS Responder shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the potential health hazards encountered by the BLS responder, other responders, and anticipated and actual patients by completing the following tasks:

    a. Survey an incident where hazardous materials/WMD have been released and evaluate suspected and identified patients for signs and symptoms of exposure

b. Collect hazard and response information from available technical resources to determine the nature of the problem and potential health effects of the substances involved

2. Plan to deliver BLS to any exposed patient within the scope of practice by completing the following tasks:

   a. Identify preplans of high-risk areas and occupancies to identify potential locations where significant human exposures can occur
   b. Identify the capabilities of the hospital network to accept exposed patients and perform emergency decontamination if required
   c. Identify the medical components of the communication plan
   d. Describe the role of the BLS level responder as it relates to the local emergency response plan and established IMS/ICS

3. Implement a prehospital treatment plan within the scope of practice by completing the following tasks:

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

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.
- NFPA 473 Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Hazardous Materials Basic Life Support training is recommended to take place in a traditional classroom setting. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and shall include any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, exercises, and a field activity that will include working within an incident command structure.

It is recommended that the individual delivering this training program possess competency at the level of the planned training program delivery. The instructor should, at a minimum, be

competent at the Operations Level and have an understanding of EMS principles at an EMT level. The instructor should also be competent in adult instructional techniques.

Acronyms

AHJ – Authority Having Jurisdiction

ALS – Advanced Life Support

BLS – Basic Life Support

CANUTEC – Canadian Transport Emergency Center

CHEMTREC – Chemical Transportation Emergency Center

CFR – Code of Federal Regulations

EMS – Emergency Medical Services

IDLH – Immediately Dangerous to Life and Health

LC50 – Lethal Concentration 50

LD50 – Lethal Dose 50

MCI – Mass Casualty Incident

MMRS – Metropolitan Medical Response System

OSHA – Occupational Safety and Health Association

PEL – Permissible Exposure Limit

PPE – Personal Protective Equipment

RDD – Radiological Dispersal Device

RED – Radiological Exposure Device

REL – Relative Exposure Limit

RSO – Radiation Safety Officer

SOP – Standard Operating Procedures

SNS – Strategic National Stockpile

TLV-STEL – Threshold Limit Value – Short Term Exposure Limit

TLV-C – Threshold Limit Value – Ceiling

TIC – Toxic Industrial Chemical

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of Hazardous Materials Basic Life Support level personnel.

HM BLS 1 **Analyzing the Incident**

HM BLS 1.1 **Surveying Hazardous Materials/WMD Incidents**

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

HM BLS 1.1.1 Given examples of the following types of containers, the BLS responder shall identify the potential mechanisms of injury/harm and possible treatment modalities:

1. Pressure
2. Non-pressure
3. Cryogenic
4. Radioactive

HM BLS 1.1.2 Given examples of the nine U.S. Department of Transportation (DOT) hazard classes, the BLS responder shall identify possible treatment modalities associated with each hazard class.

HM BLS 1.1.3 Given examples of various hazardous materials/WMD incidents at fixed facilities, the BLS responder shall identify the following available health-related resource personnel:

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

HM BLS 1.1.4 Given various scenarios of hazardous materials/WMD incidents, the BLS responder, working within an IMS/ICS, shall evaluate the off-site consequences of the release based on the physical and chemical nature of the released substance and the prevailing environmental factors, to determine the need to evacuate or to shelter-in-place affected persons.

HM BLS 1.1.5 Given the following biological agents, the BLS responder shall describe the signs and symptoms of exposure and/or illness and the likely means of dissemination:

1. Variola major virus (smallpox)
2. Clostridium botulinum
3. Coliforms (e.g., E. coli O157:H7)
4. Ricin toxin
5. Bacillus anthracis (anthrax)
6. Venezuelan equine encephalitis virus
7. Rickettsia
8. Yersinia pestis (plague)
9. Francisella tularensis (tularemia)
10. Viral hemorrhagic fever
11. Other CDC Category A, B, or C–listed organism

HM BLS 1.1.6 Given examples of various types of hazardous materials/WMD incidents involving toxic industrial chemicals (TICs) and toxic industrial materials (TIMs) (e.g., corrosives, reproductive hazards, carcinogens, nerve agents, flammable and/or explosive hazards, blister agents, blood agents, choking agents, and irritants), the BLS responder shall determine the general health risks to patients exposed to those substances in the case of any release with the following:

1. Visible cloud
2. Liquid pooling
3. Solid dispersion

HM BLS 1.1.7 **Determining If a Hazardous Materials/WMD Incident Is an Illicit Laboratory Operation**

Given examples of hazardous materials/WMD incidents involving illicit laboratory operations, BLS responders assigned to respond to illicit laboratory incidents shall identify the potential drugs/WMD being manufactured and shall meet the following related requirements:

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

HM BLS 1.1.8 Given a scenario involving radioactive materials, including an accidental release, a radiological dispersion device (RDD), and a radiological exposure device (RED), the BLS responder shall determine the pre-hospital care based upon the probable health risks and potential patient outcomes by completing the following:

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

HM BLS 1.1.9 Given three examples of pesticide labels and labeling, the BLS responder shall use the following information to determine the associated health risks:

1. Hazard statement
2. Precautionary statement
3. Signal word
4. Pesticide name

HM BLS 1.2 Collecting and Interpreting Hazard and Response Information

The BLS responder shall obtain information from the following sources to determine the nature of the medical problem and potential health effects:

1. Hazardous materials databases
2. Clinical monitoring
3. Reference materials (e.g., MSDS and ERG)

4. Technical information centers (e.g., CHEMTREC, CANUTEC, and SETIQ) and local, state, and federal authorities
5. Allied professionals
6. Regional poison control centers

HM BLS 1.3 Establishing and Enforcing Scene Control Procedures

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

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

HM BLS 2 Planning the Response

HM BLS 2.1 Identifying High Risk Areas for Potential Exposures.

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

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

HM BLS 2.2 Determining the Capabilities of the Local Hospital Network

HM BLS 2.2.1 The BLS responder shall identify the following methods and vehicles available to transport hazardous materials patients and shall determine the location and potential routes of travel to the medically appropriate local and regional hospitals, based on the patients' needs:

1. Adult trauma centers
2. Pediatric trauma centers
3. Adult burn centers
4. Pediatric burn centers
5. Hyperbaric chambers
6. Field hospitals
7. Dialysis centers
8. Supportive care facilities
9. Forward deployable assets
10. Other specialty hospitals or medical centers

HM BLS 2.2.2 Given a list of receiving hospitals in the region, the BLS responder shall describe the location, availability, and capability of hospital-based decontamination facilities.

HM BLS 2.2.3 The BLS responder shall describe the BLS protocols for pre-hospital care and SOPs for a mass casualty incident (MCI), including triage, treatment, and transport at a hazardous materials/WMD incident where exposures have occurred as developed by the AHJ and the prescribed role of medical control and poison control centers.

HM BLS 2.2.4 The BLS responder shall identify the formal and informal mutual aid resources (hospital- and nonhospital-based) for the field management of multi-casualty incidents, as follows:

1. Mass-casualty trailers with medical supplies
2. Mass-decedent capabilities
3. Regional decontamination units

4. Replenishment of medical supplies during long-term incidents
5. Rehabilitation units for the EMS responders
6. Replacement transport units for vehicles lost to mechanical trouble, collision, theft, and contamination

HM BLS 2.2.5 The BLS responder shall identify the special hazards associated with inbound and outbound air transportation of patients exposed to hazardous materials/WMD.

HM BLS 2.3 Identifying Incident Communications

HM BLS 2.3.1 Given an incident communications plan, the BLS responder shall identify the following:

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

HM BLS 2.3.2 Given examples of various patient exposure scenarios, the BLS responder shall describe the following information to be transmitted to the medical or poison control center or the receiving hospital prior to arrival:

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

HM BLS 2.4 Identifying the Role of the BLS Responder

HM BLS 2.4.1 Given scenarios involving hazardous materials/WMD, the BLS responder shall identify his or her role during hazardous materials/WMD incidents as

specified in the emergency response plan and SOPs developed by the AHJ, as follows:

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

HM BLS 2.4.2 The hazardous materials/WMD BLS responder shall describe his or her role within the hazardous materials response plan developed by the AHJ or identified in the local emergency response plan, as follows:

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

HM BLS 3 Implementing the Planned Response

HM BLS 3.1 Determining the Nature of the Incident/Providing Medical Care

The BLS responder shall demonstrate the ability to identify the mechanisms of injury or harm and the clinical implications and provide emergency medical care to those patients exposed to hazardous materials/WMD agent by completing the following tasks:

1. Determine the physical state of the released substance, in addition to the environmental influences surrounding the release, as follows:
   a. Solid
   b. Liquid

c. Gas
d. Vapor
e. Dust
f. Mist
g. Aerosol

2. Identify potential routes of exposure and correlate those routes of exposure to the physical state of the released substance, to determine the origin of the illness or injury, as follows:
   a. Inhalation
   b. Absorption
   c. Ingestion
   d. Injection
3. Describe the potential routes of entry into the body, the common signs and symptoms of exposure, and the BLS treatment options approved by the AHJ for exposure(s) to the following classification of substances:
   a. Corrosives
   b. Pesticides
   c. Chemical asphyxiants
   d. Simple asphyxiants
   e. Organic solvents
   f. Nerve agents
   g. Vesicants and blister agents
   h. Blood agents
   i. Choking agents
   j. Irritants
   k. Biological agents and toxins
   l. Incapacitating agents
   m. Radioactive materials
   n. Nitrogen compounds
   o. Opiate compounds
   p. Fluorine compounds
   q. Phenolic compounds
4. Describe the basic toxicological principles relative to assessment and treatment of persons exposed to hazardous materials, including the following:

a. Acute and chronic effects

b. Local and systemic effects

c. Dose–response relationship

5. Given examples of various hazardous materials/WMD, define the basic toxicological terms as applied to patient care:

   a. Threshold limit value-time-weighted average (TLV-TWA)

   b. Permissible exposure limit (PEL)

   c. Threshold limit value-short-term exposure limit (TLV-STEL)

   d. Immediately dangerous to life and health (IDLH)

   e. Threshold limit value — ceiling (TLV-C)

   f. Parts per million/parts per billion/parts per trillion (ppm/ppb/ppt)

6. Given examples of hazardous materials/WMD incidents with exposed patients, evaluate the progress and effectiveness of the medical care provided at a hazardous materials/WMD incident to ensure that the overall incident response objectives, along with patient care goals, are being met by completing the following tasks:

   a. Locate and track all exposed patients at a hazardous materials/WMD incident, from triage and treatment to transport to a medically appropriate facility

   b. Review the incident objectives at periodic intervals to ensure that patient care is being carried out within the overall incident action plan

   c. Ensure that the required incident command system forms are completed, along with the patient care forms, during the course of the incident

   d. Evaluate the need for trained and qualified EMS personnel, medical equipment, transport units, and other supplies based on the scope and duration of the incident

HM BLS 3.2 Decontamination

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

1. Determine if patient decontamination activities were performed prior to accepting responsibility and transferring care of exposed patients

2. Determine the need and location for patient decontamination, including mass casualty decontamination, in the event none has been performed prior to arrival of EMS personnel and complete the following tasks:

   a. Given the emergency response plan and SOPs developed by the AHJ, identify sources of information for determining the

appropriate decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident

b. Given the emergency response plan and SOPs developed by the AHJ, identify (within the plan) the supplies and equipment required to set up and implement the following:

   i. Emergency decontamination operations for ambulatory and non-ambulatory patients
   ii. Mass decontamination operations for ambulatory and non-ambulatory patients

c. Identify procedures, equipment, and safety precautions for the treatment and handling of emergency service animals brought to the decontamination corridor at hazardous materials/WMD incidents

d. Identify procedures, equipment, and safety precautions for communicating with critical, urgent, and potentially exposed patients and identify population prioritization as it relates to decontamination purposes

e. Identify procedures, equipment, and safety precautions for preventing cross contamination

HM BLS 3.3 Determining the Ongoing Need for Medical Supplies

HM BLS 3.3.1 Given examples of single-patient and multi-casualty hazardous materials/WMD incidents, the BLS responder shall determine the following:

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

HM BLS 3.4 Preserving Evidence

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

1. Determine if the incident is potentially criminal in nature and cooperate with the law enforcement agency having investigative jurisdiction
2. Identify the unique aspects of criminal hazardous materials/WMD incidents, including crime scene preservation and evidence preservation, to avoid the destruction of potential evidence on medical patients during the decontamination process

3. Identify, within the emergency response plan and SOPs developed by the AHJ, procedures, equipment, and safety precautions for securing evidence during decontamination operations at hazardous materials/WMD incidents
4. Ensure that any information regarding suspects, sequence of events during a potentially criminal act, and observations made based on patient presentation or during patient assessment are documented and communicated to the law enforcement agency having investigative jurisdiction

HM BLS 3.5 Medical Support at Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incident, the BLS responder shall describe the procedures of the AHJ for performing medical monitoring and support of hazardous materials incident response personnel and shall complete the following tasks:

1. Given examples of various hazardous materials/WMD incidents requiring the use of chemical protective ensembles, the BLS responder shall complete the following tasks:
    a. Demonstrate the ability to set up and operate a medical monitoring station
    b. Demonstrate the ability to recognize the signs and symptoms of heat stress, cold stress, heat exhaustion, and heat stroke
    c. Determine the BLS needs for responders exhibiting the effects of heat stress, cold stress, and heat exhaustion
    d. Describe the medical significance of heat stroke and the importance of rapid transport to an appropriate medical receiving facility
    e. Given a simulated hazardous materials incident, demonstrate the appropriate documentation of medical monitoring activities
2. The BLS responder responsible for pre-entry medical monitoring shall obtain hazard and toxicity information on the hazardous materials/WMD from the designated hazardous materials technical reference resource or other sources of information at the scene.
3. The following information shall be conveyed to the entry team, incident safety officer, hazardous materials officer, other EMS personnel at the scene, and any other responders responsible for the health and well-being of those personnel operating at the scene:
    a. Chemical name
    b. Hazard class
    c. Multiple hazards and toxicity information
    d. Applicable decontamination methods and procedures
    e. Potential for cross contamination

f. Procedure for transfer of patients from the constraints of the incident to the EMS

g. Prehospital management of medical emergencies and exposures

4. The BLS responder shall evaluate the pre-entry health status of responders to hazardous materials/WMD incidents as per the AHJ policies and procedures prior to their donning personal protective equipment (PPE) by performing the following tasks (consideration shall be given to excluding responders if they do not meet criteria specified by the AHJ prior to working in chemical protective clothing):

   a. Record vital signs

   b. Body weight measurements to address hydration considerations

   c. General health observations

   d. Body temperature: hypothermia/hyperthermia

   e. Blood pressure: hypotension/hypertension

   f. Pulse rate: bradycardia/tachycardia as defined

   g. Respiratory rate: bradypnea/tachypnea

5. The BLS responder shall determine how the following factors influence heat stress on hazardous materials/WMD response personnel:

   a. Baseline level of hydration

   b. Underlying physical fitness

   c. Environmental factors

   d. Activity levels during the entry

   e. Level of PPE worn

   f. Duration of entry

   g. Cold stress

6. The BLS responder shall medically evaluate all team members after decontamination and PPE removal, using the following criteria:

   a. Pulse rate determined within the first minute

   b. Pulse rate determined 3 minutes after initial evaluation

   c. Temperature

   d. Body weight

   e. Blood pressure

   f. Respiratory rate

7. The BLS responder shall recommend that any hazardous materials team member be prohibited from re-donning chemical protective clothing if any of the following criteria is exhibited:

a. Signs or symptoms of heat stress or heat exhaustion
b. Abnormal vital signs
c. Abnormal core body temperature
d. Abnormal heart rate and/or rhythm
e. Abnormal blood pressure
f. Significant acute body weight loss

8. Any team member exhibiting the signs or symptoms of extreme heat exhaustion or heat stroke shall be transported to the medical facility.
9. The BLS responder responsible for medical monitoring and support shall immediately notify the persons designated by the incident action plan that a team member required significant medical treatment or transport. Transportation shall be arranged through the designee identified in the emergency response plan.

HM BLS 3.6 Reporting and Documenting the Incident

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

HM BLS 3.7 Compiling Incident Reports

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

1. List the information to be gathered regarding the exposure of all patient(s) and describe the reporting procedures, including the following:
   a. Detailed information on the substances released
   b. Pertinent information on each patient treated and transported
   c. Routes, extent, and duration of exposures
   d. Actions taken to limit exposure
   e. Decontamination activities
2. At the conclusion of the hazardous materials/WMD incident, identify the methods used by the AHJ to evaluate transport units that might have been contaminated and the process and locations available to decontaminate those units

Guidelines for Hazardous Materials/WMD Advanced Life Support (ALS) Responder Training

Introduction

All emergency medical services (EMS) personnel at the hazardous materials/WMD advanced life support (ALS) responder level, in addition to their ALS certification, shall be trained to meet at least the core competencies of the operations level responders as defined in NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents (2013 edition)*, and all competencies of these training guidelines taken from NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents (2013 edition).*

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illnesses, and disabilities to those who accidently or intentionally encounter an incident.

Definition of a Hazardous Materials/WMD Advanced Life Support Responder

In addition to their ALS certification, operations level responders who are assigned EMS mission-specific responsibilities at hazardous materials/WMD incidents shall be trained to meet all competencies of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, Chapters 4 and 5, and all competencies for the assigned responsibilities in NFPA 473, Chapters 4 and 5.

Goal

The goal of these training guidelines is to provide a format for training so that the providers of ALS care to patients exposed to hazardous materials and functioning within the established IMS/ICS system can meet the competencies found in these guidelines. Following these guidelines will provide the knowledge and skills necessary to perform the defined core competencies safety.

Tasks

In addition to being competent at the operations level, the Hazardous Materials/WMD ALS Responder shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the potential health risks to the ALS provider, other responders, and anticipated/actual patients by completing the following tasks:

a. Survey a hazardous materials/WMD incident to determine whether harmful substances have been released and to evaluate suspected and identified patients for telltale signs of exposure

b. Collect hazard and response information from reference sources and allied professionals on the scene to determine the nature of the problem and potential health effects of the substances involved.

c. Survey the hazardous materials/WMD scene for the presence of secondary devices and other potential hazards

2. Plan to deliver ALS to exposed patients, within the scope of practice and training competencies established by the AHJ, by completing the following tasks:

a. Evaluate high-risk areas/occupancies within the AHJ to identify potential locations where significant human exposures can occur

b. Identify the capabilities of the hospital network within the AHJ to accept exposed patients and to perform emergency decontamination if required

c. Evaluate the components of the incident communication plan within the AHJ

d. Describe the role of the ALS responder as it relates to the local emergency response plan and established IMS/ICS

e. Identify supplemental regional and national medical resources, including but not limited to assets of the strategic national stockpile (SNS) and the metropolitan medical response system (MMRS)

3. Implement a prehospital treatment plan for exposed patients, within the scope of practice and training competencies established by the AHJ, by completing the following tasks:

a. Determine the nature of the hazardous materials/WMD incident as it relates to anticipated or actual patient exposures and subsequent medical treatment

b. Determine the need or effectiveness of decontamination prior to accepting an exposed patient

c. Determine if the available medical equipment, transport units, and other supplies, including antidotes and therapeutic modalities, will meet patient care needs

d. Describe the process of evidence preservation where criminal or terrorist acts are suspected or confirmed

e. Develop and implement a medical monitoring plan for those responders operating in chemical protective clothing at a hazardous materials/WMD incident

f. Evaluate the need to administer antidotes to affected patients

4. Participate in the termination of the incident by completing the following tasks:

a. Participate in an incident debriefing

b. Participate in an incident critique with the appropriate agencies

c. Report and document the actions taken by the ALS level responder at the scene of the incident

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.
- NFPA 473 Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Hazardous Materials Advanced Life Support training is recommended to take place in a traditional classroom setting. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and shall include any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, exercises, and a field activity that will include working within an incident command structure.

It is recommended that the individual delivering this training program possess competency at the level of the planned training program delivery. The instructor should, at a minimum, be competent at the Technician Level and have an understanding of EMS principles at an ALS (Paramedic) level. The instructor should also be competent in adult instructional techniques.

Acronyms

AHJ – Authority Having Jurisdiction

ALS – Advanced Life Support

BLS – Basic Life Support

CANUTEC – Canadian Transport Emergency Center

CHEMTREC – Chemical Transportation Emergency Center

CFR – Code of Federal Regulations

EMS – Emergency Medical Services

IDLH – Immediately Dangerous to Life and Health

LC50 – Lethal Concentration 50

LD50 – Lethal Dose 50

MCI – Mass Casualty Incident

MMRS – Metropolitan Medical Response System

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RDD – Radiological Dispersal Device

RED – Radiological Exposure Device

REL – Relative Exposure Limit

RSO – Radiation Safety Officer

SOP – Standard Operating Procedures

SNS – Strategic National Stockpile

TLV-STEL – Threshold Limit Value – Short Term Exposure Limit

TLV-C – Threshold Limit Value – Ceiling

TIC – Toxic Industrial Chemical

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of Hazardous Materials Advanced Life Support level personnel.

HM ALS 1 **Analyzing the Hazardous Materials Incident**

HM ALS 1.1 **Surveying Hazardous Materials/WMD Incidents**

Given scenarios of hazardous materials/WMD incidents, assess the nature and severity of the incident as it relates to anticipated or actual EMS responsibilities at the scene.

HM ALS 1.1.1 Given examples of the following marked transport vehicles (and their corresponding shipping papers or identification systems) that can be involved in hazardous materials/WMD incidents, evaluate the general health risks based on the physical and chemical properties of the anticipated contents:

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

HM ALS 1.1.2 Given examples of various hazardous materials/WMD incidents at fixed facilities, demonstrate the ability to perform the following tasks:

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

HM ALS 1.1.3 Identify two ways to obtain a material safety data sheet (MSDS) at a hazardous materials/WMD incident and shall demonstrate the ability to identify the following health-related information:

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

HM ALS 1.1.4 Given scenarios at various fixed facilities, transportation incidents, pipeline release scenarios, maritime incidents, or any other unexpected hazardous materials/WMD incident, working within an incident command system must evaluate the off-site consequences of the release, based on the physical and chemical nature of the released substance, and the prevailing environmental factors to determine the need to evacuate or shelter-in-place affected persons.

HM ALS 1.1.5 Given examples of the following biological threat agents, define the various types of biological threat agents, including the signs and symptoms of exposure, mechanism of toxicity, incubation periods, possible disease patterns, and likely means of dissemination:

1. Variola major virus (smallpox)
2. Clostridium botulinum (botulism)
3. Coliforms (e.g., E. coli O157:H7)
4. Ricin toxin
5. Bacillus anthracis (anthrax)
6. Venezuelan equine encephalitis virus
7. Rickettsia
8. Yersinia pestis (plague)
9. Francisella tularensis (tularemia)
10. Viral hemorrhagic fever
11. Other CDC Category A, B, or C–listed organism

HM ALS 1.1.6 Given examples of various types of hazardous materials/WMD incidents involving toxic industrial chemicals, toxic industrial materials, blister agents, blood agents, nerve agents, choking agents and irritants, determine the general health risks to patients exposed to those substances and identify those patients who may be candidates for antidotes.

HM ALS 1.1.7 Given examples of hazardous materials/WMD found at illicit laboratories, identify general health hazards associated with the chemical substances that are expected to be encountered.

HM ALS 1.1.8 Given examples of a hazardous materials/WMD incident involving radioactive materials, including radiation dispersion devices (RDD), radiation exposure devices (RED), and improvised nuclear devices (IND), determine the probable health risks and potential patient outcomes by completing the following tasks:

1. Determine the types of radiation (alpha, beta, gamma, and neutron), the isotope if possible, and potential health effects of each
2. Determine the most likely exposure pathways for a given radiation exposure, including inhalation, ingestion, injection, and direct skin exposure
3. Describe the difference between radioactive contamination and radiation exposure
4. Identify priorities for decontamination in scenarios involving radioactive materials

5. Describe the manner in which acute medical illness or traumatic injury can influence decisions about decontamination and patient transport

HM ALS 1.1.9 Given examples of typical labels found on pesticide containers, define the following terms:

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

HM ALS 1.2 Collecting and Interpreting Hazard and Response Information

Demonstrate the ability to utilize various reference sources at a hazardous materials/WMD incident, including the following:

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

HM ALS 1.2.1 Identifying Secondary Devices

Given scenarios involving hazardous materials/WMD, describe the importance of evaluating the scene for secondary devices prior to rendering patient care, including the following safety points:

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

HM ALS 2 **Planning the Response.**

HM ALS 2.1 **Identifying High-Risk Areas for Potential Exposures**

HM ALS 2.1.1 Given an events calendar and pre-incident plans, which can include the local emergency planning committee plan as well as the agency's emergency response plan and SOPs, shall identify the venues for mass gatherings, industrial facilities, potential targets for terrorism, or any other locations where an accidental or intentional release of a harmful substance can pose an unreasonable health risk to any person within the local geographical area as determined by the AHJ and shall do the following:

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

HM ALS 2.2 **Determining the Capabilities of the Local Hospital Network**

HM ALS 2.2.1 Identify the methods and vehicles available to transport hazardous materials patients and shall determine the location and potential routes of travel to the following appropriate local and regional hospitals, based on patient need:

1. Adult trauma centers
2. Pediatric trauma centers

3. Adult burn centers
4. Pediatric burn centers
5. Hyperbaric chambers
6. Field hospitals
7. Other specialty hospitals or medical centers

HM ALS 2.2.2 Given a list of local receiving hospitals in the AHJ's geographic area, describe the location and availability of hospital-based decontamination facilities.

HM ALS 2.2.3 Describe the ALS protocols and SOPs developed by the AHJ and the prescribed role of medical control and poison control centers during mass casualty incidents, at hazardous materials/WMD incidents where exposures have occurred, and in the event of disrupted radio communications.

HM ALS 2.2.4 Identify the following mutual aid resources (hospital and nonhospital based) identified by the AHJ for the field management of multi-casualty incidents:

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

HM ALS 2.2.5 **I**dentify the special hazards associated with inbound and outbound air transportation of patients exposed to hazardous materials/WMD.

HM ALS 2.2.6 Describe the available medical information resources concerning hazardous materials toxicology and response.

HM ALS 2.3 **Identifying Incident Communications**

HM ALS 2.3.1 The ALS responder shall identify the components of the communication plan within the AHJ geographic area and determine that the EMS providers have the ability to communicate with other responders on the scene, with transport units, and with local hospitals.

HM ALS 2.3.2 Given examples of various patient exposure scenarios, the ALS responder shall describe the following information to be transmitted to the medical control or poison control center or the receiving hospital prior to arrival:

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

HM ALS 2.4 Identifying the Role of the ALS Level Responder

HM ALS 2.4.1 Given scenarios involving hazardous materials/WMD, identify his or her role during hazardous materials/WMD incidents as specified in the emergency response plan and SOPs developed by the AHJ, as follows:

1. Describe the purpose, benefits, and elements of the incident command system at it relates to the ALS responder
2. Describe the typical incident command structure for the emergency medical component of a hazardous materials/WMD incident as specified in the emergency response plan and SOPs developed by the AHJ
3. Describe the role of the ALS responder within the incident command system
4. Describe the role of the ALS responder within the incident command system during a hazardous materials/WMD incident when an ICS does not currently exist

5. Identify the procedures for requesting additional resources at a hazardous materials/WMD incident

HM ALS 2.4.2 Describe the hazardous materials/WMD ALS responder's role in the hazardous materials/WMD response plan developed by the AHJ or identified in the local emergency response plan as follows:

1. Determine the toxic effect of hazardous materials/WMD
2. Estimate the number of patients
3. Recognize and assess the presence and severity of symptoms
4. Assess the impact on the health care system
5. Perform appropriate patient monitoring
6. Communicate pertinent information
7. Estimate pharmacological need
8. Address threat potential for clinical latency
9. Estimate dosage — exposure
10. Estimate dosage — treatment
11. Train in appropriate monitoring

HM ALS 2.5 **Supplemental Medical Resources**

Given scenarios of various hazardous materials/WMD mass casualty incidents, identify the supplemental medical resources available to the AHJ, including the following:

1. Describe the strategic national stockpile (SNS) program, including the following components:
    a. Intent and goals of the SNS program
    b. Procedures and requirements for deploying the SNS to a local jurisdiction
    c. Typical supplies contained in 12-hour push package
    d. Role of the technical advisory response unit (TARU)
2. Describe the metropolitan medical response system (MMRS) including the following components:
    a. Scope, intent, and goals of the MMRS
    b. Capabilities and resources of the MMRS
    c. Eight capability focus areas of the MMRS

HM ALS 3 **Implementing the Planned Response**

HM ALS 3.1 **Determining the Nature of the Incident and Providing Medical Care**

Describe the ability to provide emergency medical care to those patients exposed to hazardous materials/WMD by completing the following tasks:

1. Determine the physical state of the released substance and the environmental influences surrounding the release, as follows:
    a. Solid
    b. Liquid
    c. Gas, vapor, dust, mist, aerosol
2. Identify potential routes of exposure, and correlate those routes of exposure to the physical state of the released substance, to determine the origin of the illness or injury, as follows:
    a. Inhalation
    b. Absorption
    c. Ingestion
    d. Injection
3. Describe the potential routes of entry into the body, the common signs and symptoms of exposure, and the ALS treatment options approved by the AHJ (e.g., advanced airway management, drug therapy), including antidote administration where appropriate, for exposure(s) to the following classification of substances:
    a. Corrosives
    b. Pesticides
    c. Chemical asphyxiants
    d. Simple asphyxiants
    e. Organic solvents
    f. Nerve agents
    g. Vesicants
    h. Irritants (riot control agents)
    i. Biological agents and toxins
    j. Incapacitating agents
    k. Radioactive materials
    l. Nitrogen compounds
    m. Opiate compounds
    n. Fluorine compounds
    o. Phenolic compounds

4. Describe the basic toxicological principles relative to assessment and treatment of persons exposed to hazardous materials, including the following:
    a. Acute and chronic effects
    b. Local and systemic effects
    c. Dose-response relationship
5. Given examples of various hazardous substances, define the basic toxicological terms as they relate to the treatment of an exposed patient, as follows:
    a. Threshold limit value — time weighted average (TLV-TWA)
    b. Lethal doses and lethal concentrations, as follows:
        i. LDlo
        ii. LD50
        iii. LDhi
        iv. LClo
        v. LC50
        vi. LChi
    c. Parts per million/parts per billion/parts per trillion (ppm/ppb/ppt)
    d. Immediately dangerous to life and health (IDLH)
    e. Permissible exposure limit (PEL)
    f. Recommended exposure limit (REL)
    g. Threshold limit value — short-term exposure limit (TLV-STEL)
    h. Threshold limit value — ceiling (TLV-C)
    i. Solubility
    j. Poison — a substance that causes injury, illness, or death
    k. Toxic— harmful nature related to amount and concentration
6. Given examples of hazardous materials/WMD incidents with exposed patients, evaluate the progress and effectiveness of the medical care provided at a hazardous materials/WMD incident, to ensure that the overall incident response objectives, along with patient care goals, are being met by completing the following tasks:
    a. Locate and track all exposed patients at a hazardous materials/WMD incident, from triage and treatment to transport to the appropriate hospital
    b. Review the incident objectives at periodic intervals to ensure that patient care is being carried out within the overall incident response plan

c. Ensure that the incident command system forms are completed, along with the patient care forms required by the AHJ, during the course of the incident

d. Evaluate the need for trained and qualified EMS personnel, medical equipment, transport units, and other supplies, including antidotes based on the scope and duration of the incident

HM ALS 3.2 Decontaminating Exposed Patients

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

1. Given the emergency response plan and SOPs developed by the AHJ, identify and evaluate the patient decontamination activities performed prior to accepting responsibility for and transferring care of exposed patients
2. Determine the need and location for patient decontamination, including mass-casualty decontamination, in the event none has been performed prior to arrival of EMS personnel, and complete the following tasks:
    a. Given the emergency response plan and SOPs developed by the AHJ, identify and evaluate the patient decontamination activities performed prior to accepting responsibility for and transferring care of exposed patients; identify sources of information for determining the appropriate decontamination procedure and how to access those resources in a hazardous materials/WMD incident
    b. Given the emergency response plan and SOPs developed by the AHJ, identify and evaluate the patient decontamination activities performed prior to accepting responsibility for and transferring care of exposed patients
    c. Given the emergency response plan and SOPs provided by the AHJ, identify the supplies and equipment required to set up and implement technical or mass-casualty decontamination operations for ambulatory and non-ambulatory patients
    d. Given the emergency response plan and SOPs developed by the AHJ, identify the procedures, equipment, and safety precautions for securing evidence during decontamination operations at hazardous materials/WMD incidents
    e. Identify procedures, equipment, and safety precautions for handling tools, equipment, weapons, and law enforcement and K-9 search dogs brought to the decontamination corridor at hazardous materials/WMD incidents
    f. Identify procedures, equipment, and safety precautions for communicating with critically, urgently, and potentially exposed patients, and population prioritization and management techniques

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

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

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

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

HM ALS 3.3 Evaluating the Need for Medical Supplies

Given examples of single-patient and multi-casualty hazardous materials/WMD incidents, determine if the available medical equipment, transport units, and other supplies, including antidotes, will meet or exceed expected patient care needs throughout the duration of the incident.

HM ALS 3.4 Evidence Preservation

Given examples of hazardous materials/WMD incidents where criminal acts are suspected, make every attempt to preserve evidence during the course of delivering patient care by completing the following tasks:

1. Determine if the incident is potentially criminal in nature and cooperate with the law enforcement agency having investigative jurisdiction
2. Identify the unique aspects of criminal hazardous materials/WMD incidents, including crime scene preservation, evidence preservation, and destruction of potential evidence found on medical patients, and/or the destruction of evidence during the decontamination process
3. Ensure that any information regarding suspects, sequence of events during a potential criminal act, or observations made based on patient presentation or during patient assessment are documented and communicated and passed on to the law enforcement agency having investigative jurisdiction

HM ALS 3.5 Medical Support at Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incidents, the ALS responder shall describe the procedures of the AHJ for performing medical monitoring and support of hazardous materials incident response personnel, and shall complete the following tasks:

1. Obtain hazard and toxicity information on the released substance from the designated hazardous materials technical reference resource or other reliable sources of information at the scene. The following

information shall be conveyed to the entry team, incident safety officer, hazardous materials officer, other EMS personnel at the scene, and any other responders responsible for the health and well-being of those personnel operating at the scene:

a. Chemical name

b. Hazard class

c. Hazard and toxicity information

d. Applicable decontamination methods and procedures

e. Potential for secondary contamination

f. Procedure for transfer of patients from the constraints of the incident to the emergency medical system

g. Prehospital management of medical emergencies and exposures, including antidote administration

2. Evaluate the pre-entry health status of hazardous materials/WMD responders prior to donning PPE by performing the following tasks:

   a. Record vital signs

   b. Record body weight measurements

   c. Record general health observations

3. Determine the medical fitness of those personnel charged with donning chemical protective clothing, using the criteria set forth in the emergency action plan (EAP) and the SOP developed by the AHJ. Consideration shall be given to excluding responders from working in personal protective equipment if they exhibit any significant abnormalities in the following areas:

   a. Body temperature (taking temperature or skin temperature does not correlate to body temperature)

   b. Vital signs

4. Determine how the following factors influence heat stress on hazardous materials/WMD response personnel:

   a. Baseline level of hydration

   b. Underlying physical fitness

   c. Environmental factors

   d. Activity levels during the entry

   e. Level of PPE worn

   f. Duration of entry

   g. Cold stress

5. Given examples of various hazardous materials/WMD incidents requiring the use of chemical protective ensembles, complete the following tasks:

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

b. Demonstrate the ability to recognize the signs and symptoms of heat stress, heat exhaustion, and heat stroke

c. Determine the ALS needs for responders exhibiting the effects of heat stress, cold stress, and heat exhaustion

d. Describe the medical significance of heat stroke and the importance of rapid transport to an appropriate medical receiving facility

6. Given a simulated hazardous materials/WMD incident, demonstrate documentation of medical monitoring activities.

7. Evaluate all team members after decontamination and PPE removal, using the following criteria:

   a. Pulse rate — done within the first minute

   b. Pulse rate — 3 minutes after initial evaluation

   c. Temperature

   d. Body weight

   e. Blood pressure

   f. Respiratory rate

8. Recommend that any hazardous materials team member exhibiting any of the following signs be prohibited from re-donning chemical protective clothing:

   a. Signs or symptoms of heat stress or heat exhaustion

   b. Abnormal vital signs

   c. Abnormal core body temperature

   d. Abnormal heart rate or rhythm

   e. Significant acute body weight loss

9. Notify immediately the appropriate persons designated by the emergency response plan if a team member requires significant medical treatment or transport (arranged through the appropriate designee identified by the emergency response plan).

HM ALS 4 **Terminating the Incident**

Upon termination of the hazardous materials/WMD incident, complete the reporting, documentation, and EMS termination activities as required by the local emergency response plan or the organization's SOPs and shall meet the following requirements:

1. Identify the reports and supporting documentation required by the emergency response plan or SOPs

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

Summary: EMS (BLS/ALS) Level Training

Audience

These guidelines were developed for EMS personnel who will be called to participate in patient care involving victims from a Hazardous Materials/WMD release. These EMS responders are expected to understand the dynamics of a hazardous materials incident including the toxic and dangerous properties of the material involved and understand how to care for patients who become exposed and/or contaminated in these incidents.

Prerequisites

Awareness Level Training

Operations Level Training (24 hour program)

Training

These training programs (BLS and ALS) require an in-depth knowledge of physiology and toxicology. Program participants must be capable of demonstrating competency in all state objectives.

It is recommended that the course includes didactic, lab instruction, practical application, scenario and response based training including a simulated full scale exercise where the hazmat medical responders work under an incident command structure.

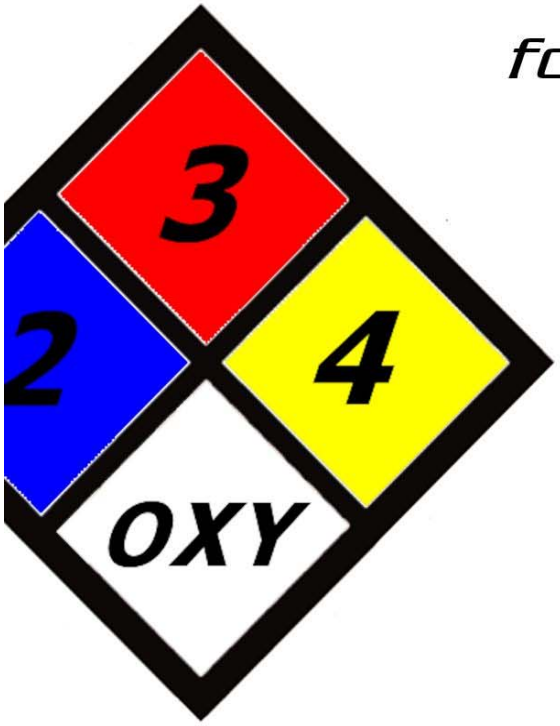
Refresher Training

Refresher training that includes both didactic and hands-on activities is recommended to occur annually.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**



Guidelines for Law Enforcement Officers Training

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

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Guidelines for Law Enforcement Officers Receiving Awareness Level Training

Introduction

Law Enforcement Officers shall be trained to meet the requirements for responders at the awareness level, as defined in OSHA 29 CFR 1910.120 (q)(i), and meet the competencies in these guidelines taken from NFPA 472, Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 edition.

Purpose

The purpose of these guidelines is to specify minimum competencies required for law enforcement officers who encounter or respond to hazardous materials/WMD incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illness, and disabilities to those who accidently or intentionally encounter an incident.

It shall not be the intention of these guidelines to restrict any organization/jurisdiction from exceeding these minimum requirements.

Definition of a Law Enforcement Officer Trained at an Awareness Level

Law enforcement officers at the awareness level are personnel 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.

In addition, the law enforcement awareness trained personnel are required to have:

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify the hazardous substances, if possible.
- An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
- The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

Goal

The goal of the guidelines in this section shall be to provide personnel already on the scene of a hazardous materials/WMD incident with the knowledge and skills to perform the required tasks safely and effectively.

Tasks

When already on the scene of a hazardous materials/WMD incident, the law enforcement 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 and response 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.

    a. Initiate protective actions.

    b. Initiate the notification process.

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Law enforcement officers hazardous materials awareness training can take place as an on-line program, traditional classroom setting, or a combination of both. The training should include specifics of the workplace and/or additional objectives required by the authority having jurisdiction (AHJ). It is recommended that the training include a table top or field activity involving working within an incident command structure.

It is recommended that the individual delivering Awareness level training possess competency in the planned training program delivery. The instructor should also be competent in adult instructional techniques.

Acronyms

AHJ – Authority Having Jurisdiction

DOT – Department of Transportation

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Association

UN/NA – United Nations/North America

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of law enforcement awareness level personnel.

AWARE 1 Analyzing the Incident

AWARE 1.1 Detecting the Presence of Hazardous Materials/WMD

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

1. Definitions of both hazardous material (or dangerous goods, in Canada) and WMD
2. UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division.
3. The Determine the hazards associated with each hazard class and division.
4. Difference between hazardous materials/WMD incidents and other emergencies
5. Occupancies and locations in the community where hazardous materials/WMD found
6. Container shapes that can indicate the presence of hazardous materials/WMD
7. Facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
    a. Transportation markings
    b. NFPA 704
    c. Military hazardous materials/WMD markings

d. Special hazard communication markings

e. Pipeline markings

f. Container markings

8. NFPA 704 marking and describe the significance of the colors, numbers, and special symbols
9. U.S. and Canadian placards and labels that indicate hazardous materials/WMD
10. Basic information on material safety data sheets (MSDS) and shipping papers for hazardous materials including the location and sections in each.
11. Other clues to include sight, sound, and odor and the limitations of using the senses in determining the presence or absence of hazardous materials/WMD
12. Four types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD
13. The difference between a chemical and a biological incident
14. Four indicators of possible criminal or terrorist activity involving chemical agents, biological agents, radiologic agents, illicit laboratories (clandestine laboratories, weapons lab, ricin lab) explosives, and secondary devices.

AWARE 1.2 Surveying Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incidents, 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, identify:

1. Difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in transportation
2. Sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation
3. Sources for obtaining the names of hazardous materials/WMD at a facility

AWARE 1.3 Collecting Hazard Information

Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), 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 identify:

1. Methods for determining the guidebook page for a hazardous material/WMD
2. General types of hazards found on each guidebook page

AWARE 2 Implementing the Planned Response

AWARE 2.1 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,* identify the actions to be taken to protect themselves and others and to control access to the scene by completing the following requirements, identify:

1. The location of both the emergency response plan and/or standard operating procedures
2. The role of the awareness level personnel during hazardous materials/WMD incidents, including precautions taken to protect themselves, others, and providing emergency medical care to victims of hazardous materials/WMD incidents.
3. The following basic precautions to be taken to protect themselves and others in hazardous materials/WMD incidents, identify:
    a. The precautions necessary when providing emergency medical care to victims of hazardous materials/WMD incidents
    b. Typical ignition sources found at the scene of hazardous materials/WMD incidents
    c. Ways hazardous materials/WMD are harmful to people, the environment, and property
    d. 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

AWARE 2.2 Initiating the Notification Process

Given scenarios involving hazardous materials/WMD incidents, identify the initial notifications to be made and how to make them, consistent with the AHJ.

Summary: Law Enforcement Officer Training Guidelines

Audience

These guidelines were developed for Law Enforcement Officer who could encounter an emergency involving hazardous materials/weapons of mass destruction (WMD) and are expected to recognize the presence of the hazardous materials/WMD, protect themselves, call for trained personnel, and secure the area.

Training

Law Enforcement Officer training can take place in a digital (on-line) format, traditional classroom format or a combination of both. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and any additional training to meet applicable governmental occupational health and safety regulations. The competencies found in these guidelines include:

- An understanding of hazardous materials terms, basic hazard and risk assessment, and the role of an officer at a hazardous materials incident.
- The ability to detect an incident and to take appropriate actions to keep both the Awareness trained person and others safe.
- Make appropriate notification with usable and critical information.

Refresher Training

Refresher training is recommended to occur annually.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**

Guidelines for Public Health & Hospitals Training

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

NFPA 473 Competencies for EMS Personnel Responding to

Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

Table of Contents

Guidelines for Public Health and Hospitals Hazardous Materials Training

Introduction

Healthcare employees who are not specifically addressed by the Florida State Emergency Response Commission shall be trained to meet the competencies of the awareness level. Awareness level trained personnel shall be trained to meet the requirements for the first responder at the awareness level, as defined in OSHA 29 CFR 1910.120 (q)(i), and meet the competencies in these guidelines taken from NFPA 472, Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 edition.

Should the employee's role require a level of competency at the operations level and to perform patient decontamination efforts, then the individual shall be trained to the operational competencies defined in the second portion of these guidelines. Also included in the Operations section are additional guidelines on the provision of patient decontamination. If their role requires a response that would be defined as hazardous materials technician, the technician guidelines available as a separate document would be used to define the recommended competencies and training guidelines.

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who encounter or respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illness, and disabilities to those who accidently or intentionally encounter an incident.

It shall not be the intention of these guidelines to restrict any organization/jurisdiction from exceeding these minimum requirements.

Definition of a Hazardous Materials Awareness Trained Personnel

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.

In addition, Awareness Trained Personnel are required to have:

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify the hazardous substances, if possible.

- An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
- The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

Definition of Hazardous Materials Operations Trained Personnel

Persons who respond to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

In addition, Operations Trained Personnel are required to have:

- Knowledge of the basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment provided to the first responder operational level.
- An understanding of basic hazardous materials terms.
- Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
- Know how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

Goal

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 required tasks safely and effectively.

Tasks

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 and response 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.*

   a. Initiate protective actions.

   b. Initiate the notification process.

Operations Level Tasks

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 patient 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

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Hazardous Materials Awareness training can take place as an on-line program, traditional classroom setting, or a combination of both. The training should include specifics of the workplace and/or additional objectives required by the authority having jurisdiction (AHJ). It is recommended that the training include a table top or field activity involving working within an incident command structure.

It is recommended that the individual delivering Awareness level training possess competency in the level of the planned training program delivery. The instructor should also be competent in adult instructional techniques.

Hazardous Materials Operations training is recommended to take place in a traditional classroom setting. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and shall include any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, exercises, and a field activity that will include working within an incident command structure.

It is recommended that the individual delivering Operational level training possess competency in the level of the planned training program delivery. The instructor should also be competent in adult instructional techniques.

Acronyms

AFFF – Aqueous Film-forming Foam

AHJ – Authority Having Jurisdiction

APR – Air Purifying Respirator

CHEMTREC – Chemical Transportation Emergency Center

CANUTEC – Canadian Transport Emergency Center

DOT – Department of Transportation

EOD – Explosive Ordinance Disposal

FBI – Federal Bureau of Investigation

HME – Homemade Explosive

ICS – Incident Command System

IED – Improvised Explosive Devices

MC – Motor Carrier

MSDS – Materials Safety Data Sheet (now Safety Data Sheets)

NBSCAB – National Bomb Squad Commander Advisory Board

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Association

PAPR – Powered Air Purifying Respirator

PCP – Pest Control Product

PPE – Personal Protective Equipment

SCBA – Self Contained Breathing Apparatus

SDS – Safety Data Sheet

SETIQ – Sistema de Emergencia para la Transportacion de la Industria Quimca (Transportation for Chemical Industry, Mexico)

UN/NA – United Nations/North America

UN/DOT – United Nations/Department of Transportation

VOC – Volatile Organic Compounds

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of awareness level personnel.

AWARENESS LEVEL TRAINING

AWARE 1 Analyzing the Incident

AWARE 1.1 Detecting the Presence of Hazardous Materials/WMD

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

1. Definitions of both hazardous material (or dangerous goods, in Canada) and WMD
2. UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division.
3. The Determine the hazards associated with each hazard class and division.
4. Difference between hazardous materials/WMD incidents and other emergencies
5. Occupancies and locations in the community where hazardous materials/WMD found
6. Container shapes that can indicate the presence of hazardous materials/WMD
7. Facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
    a. Transportation markings
    b. NFPA 704
    c. Military hazardous materials/WMD markings

d. Special hazard communication markings

e. Pipeline markings

f. Container markings

8. NFPA 704 marking and describe the significance of the colors, numbers, and special symbols
9. U.S. and Canadian placards and labels that indicate hazardous materials/WMD
10. Basic information on material safety data sheets (MSDS) and shipping papers for hazardous materials including the location and sections in each.
11. Other clues to include sight, sound, and odor and the limitations of using the senses in determining the presence or absence of hazardous materials/WMD
12. Four types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD
13. The difference between a chemical and a biological incident
14. Four indicators of possible criminal or terrorist activity involving chemical agents, biological agents, radiologic agents, illicit laboratories (clandestine laboratories, weapons lab, ricin lab) explosives, and secondary devices.

AWARE 1.2 Surveying Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incidents, 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, identify:

1. Difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in transportation
2. Sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation
3. Sources for obtaining the names of hazardous materials/WMD at a facility

AWARE 1.3 Collecting Hazard Information

Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), 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 identify:

1. Methods for determining the guidebook page for a hazardous material/WMD
2. General types of hazards found on each guidebook page

AWARE 2 Implementing the Planned Response

AWARE 2.1 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,* identify the actions to be taken to protect themselves and others and to control access to the scene by completing the following requirements, identify:

1. The location of both the emergency response plan and/or standard operating procedures
2. The role of the awareness level personnel during hazardous materials/WMD incidents, including precautions taken to protect themselves, others, and providing emergency medical care to victims of hazardous materials/WMD incidents.
3. The following basic precautions to be taken to protect themselves and others in hazardous materials/WMD incidents, identify:
    a. The precautions necessary when providing emergency medical care to victims of hazardous materials/WMD incidents
    b. Typical ignition sources found at the scene of hazardous materials/WMD incidents
    c. Ways hazardous materials/WMD are harmful to people, the environment, and property
    d. 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

AWARE 2.2 Initiating the Notification Process

Given scenarios involving hazardous materials/WMD incidents, identify the initial notifications to be made and how to make them, consistent with the AHJ.

OPERATIONS LEVEL TRAINING

OPS 1 Analyzing the Incident.

OPS 1.1 Surveying Hazardous Materials/WMD Incidents

Given scenarios involving hazardous materials/WMD incidents collect information about the incident to identify the containers, the materials involved, the surrounding conditions, and whether hazardous materials/WMD have been released.

OPS 1.1.1 Given three examples each of liquid, gas, and solid hazardous material or WMD, including various hazard classes identify the general shapes of containers in which the hazardous materials/WMD are typically found***.***

OPS 1.1.1.1 Given examples of the following tank cars 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

OPS 1.1.1.2 Given examples of the following intermodal tanks identify each intermodal tank by type, as follows:

1. Non-pressure intermodal tanks
2. Pressure intermodal tanks
3. Specialized intermodal tanks, including Cryogenic intermodal tanks and Tube modules

OPS 1.1.1.3 Given examples of the following cargo tanks 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

OPS 1.1.1.4 Given examples of the following storage tanks identify each tank by type, as follows:

1. Cryogenic liquid tank
2. Non-pressure tank
3. Pressure tank

OPS 1.1.1.5 Given examples of the following non-bulk packaging identify each package by type, as follows:

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

OPS 1.1.1.6 Given examples of the following packaging identify the characteristics of each Intermediate bulk container (IBC) and ton container.

OPS 1.1.1.7 Given examples of the following radioactive material packages 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

OPS 1.1.2 Given examples of containers identify the markings that differentiate one container from another.

OPS 1.1.2.1 Given examples of the following marked transport vehicles and their corresponding shipping papers 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

OPS 1.1.2.2 Given examples of facility containers identify the markings indicating container size, product contained, and/or site identification numbers.

OPS 1.1.3 Given examples of hazardous materials incidents identify the name(s) of the hazardous material(s).

OPS 1.1.3.1 Identify the following information on a pipeline marker:

1. Emergency telephone number
2. Owner
3. Product

OPS 1.1.3.2 Given a pesticide label 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

OPS 1.1.3.3 Given a label for a radioactive material identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable.

OPS 1.1.4 Identify and list the surrounding conditions that should be noted when a hazardous materials/WMD incident is surveyed.

OPS 1.1.5 Describe ways to verify information obtained from the survey of a hazardous materials/WMD incident.

OPS 1.1.6 Identify at least three additional hazards that could be associated with an incident involving terrorist or criminal activities.

OPS 1.2 Collecting Hazard and Response Information

OPS 1.2.1 Given scenarios involving known hazardous materials/WMD collect hazard and response information using MSDS/SDS, CHEMTREC/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/SDS in an emergency
3. Using an MSDS/SDS 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

OPS 1.3 Predicting the Likely Behavior of a Material and Its Container

OPS 1.3.1 Given scenarios involving hazardous materials/WMD incidents, each with a single hazardous material/WMD 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 range
        v. Flash point
        vi. Particle size
        vii. Persistence
        viii. Physical state
        ix. Specific gravity
        x. Toxic products of combustion
        xi. Vapor density
        xii. Vapor pressure
        xiii. Water solubility
        xiv. (Auto) Ignition temperature
        xv. Radiation (ionizing and non-ionizing)
    b. Identify the differences between the following terms:

i. Contamination & secondary contamination
ii. Exposure & contamination
iii. Exposure & hazard
iv. Infectious & contagious
v. Acute effects & chronic effects
vi. Acute & 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. Toxic
   i. Sensitizer, allergen
   j. Target organ effects
9. Given the following, identify the corresponding UN/DOT hazard class and division:
   a. Blood agents
   b. Choking agents
   c. Irritants (riot control agents)
   d. Nerve agents
   e. Radiological materials
   f. Vesicants (blister agents)
   g. Biological agents and biological toxins

OPS 1.4 Estimating Potential Harm

OPS 1.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 2 Planning the Response

OPS 2.1 Describing Response Objectives

OPS 2.1.1 Given at least two scenarios involving hazardous materials/WMD incidents 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 protected with 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

OPS 2.2 Identifying Action Options

OPS 2.2.1 Given examples of hazardous materials/WMD incidents (facility and transportation 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

OPS 2.3 Determining Suitability of Personal Protective Equipment

OPS 2.3.1 Given examples of hazardous materials/WMD incidents, including the names of the hazardous materials/WMD involved and the anticipated type of exposure 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

OPS 2.4 Identifying Decontamination Issues

OPS 2.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 2.5 Selecting Decontamination Procedures

Given a scenario involving a hazardous materials/WMD incident, the healthcare hazardous materials operations trained responder 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

OPS 3 Implementing the Planned Response

OPS 3.1 Establishing Scene Control

OPS 3.1.1 Given two scenarios involving hazardous materials/WMD incidents explain how to establish and maintain scene control, including control zones and emergency decontamination, 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 either a Hazardous material incidents or a Hazardous materials/WMD incidents involving criminal activities
6. Identify the procedures for ensuring coordinated communication between responders and to the public

OPS 3.2 Preserving Evidence

OPS 3.2.1 Given two scenarios involving hazardous materials/WMD incidents describe the process to preserve evidence as listed in the emergency response plan and/or standard operating procedures.

OPS 3.3 Initiating the Incident Command System.

OPS 3.3.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 3.4 Using Personal Protective Equipment

OPS 3.4.1 Given the personal protective equipment provided by the AHJ 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

OPS 3.5 Performing Decontamination Operations Identified in the Incident Action Plan

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

OPS 4 Evaluating Progress

OPS 4.1 Evaluating the Status of Planned Response

OPS 4.1.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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

OPS 4.2 Evaluating the Effectiveness of the Decontamination Process

Given an incident action plan for a scenario involving a hazardous materials/WMD incident, shall evaluate the effectiveness of any decontamination procedures identified in the incident action plan.

OPS 4.3 Communicating the Status of Planned Response

OPS 4.3.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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.

Mission Specific Training Mass Decontamination

Introduction

The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall be that person, assigned to implement mass decontamination operations at hazardous materials/WMD incidents.

Training Requirements

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, all core competencies at the operations level, all mission-specific competencies for personal protective equipment, and all competencies in this section.

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.

Goal

The goal of training is 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 safely and effectively. These tasks include:

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

MASS DECON 1 Planning the Response

MASS DECON 1.1 Selecting Personal Protective Equipment

Given an emergency response plan or standard operating procedures and the personal protective equipment provided by the AHJ, select the personal protective equipment required to support mass decontamination at hazardous materials/WMD incidents based on local procedures.

MASS DECON 1.2 Selecting Decontamination Procedures

Given scenarios involving hazardous materials/WMD incidents, 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:

MASS DECON 1.2.1 Identify the advantages and limitations of mass decontamination operations

MASS DECON 1.2.2 Describe the advantages and limitations of each of the following mass decontamination methods:

1. Dilution
2. Isolation
3. Washing

MASS DECON 1.2.3 Identify sources of information for determining the correct mass decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident

MASS DECON 1.2.4 Given resources provided by the AHJ, identify the supplies and equipment required to set up and implement mass decontamination operations

MASS DECON 1.2.5 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

MASS DECON 2 Implementing the Planned Response

MASS DECON 2.1 Performing Incident Management Duties

Given a scenario involving a hazardous materials/WMD incident and the emergency response plan or standard operating procedures, 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.

MASS DECON 2.2 Performing Decontamination Operations Identified in Incident Action Plan

Demonstrate the ability to set up and implement mass decontamination operations for ambulatory and non-ambulatory victims.

MASS DECON 3 Evaluating Progress

MASS DECON 3.1 Evaluating the Effectiveness of the Mass Decontamination Process

Given examples of contaminated items that have undergone the required decontamination, 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.

MASS DECON 4 Terminating the Incident

MASS DECON 4.1 Reporting and Documenting the Incident

Given a scenario involving a hazardous materials/WMD incident, 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

Summary: Public Health and Hospital Hazardous Materials Training Guidelines

Audience

These guidelines were developed for persons who respond accidently or purposefully to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

Prerequisites

Awareness level training is required prior to the completion of the Operations level.

Training

Awareness Level training can take place using digital presentation either on-line or in a computer format. All hazmat training should include a component of application.

Operations Level training is recommended to take place in a traditional classroom setting and include opportunities for field study and application.

In the case of both Public Health and Hospital personnel charged with the responsibility of providing emergency patient decontamination, additional training needs to be accomplished which includes the proper selection of PPE, procedures for providing decontamination, and an evaluation of decontamination efforts. All of these sections have been added to this operational guideline.

The training should include any additional objectives required by the authority having jurisdiction (AHJ) and any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, large and small exercise groups, and a field activity that will include working within an incident command structure.

The competencies found in these guidelines include:

- An understanding of hazardous materials terms, basic hazard and risk assessment, and the role of the Firefighter at a hazardous materials incident.
- The ability to perform basic control. Containment and/or confinement techniques with proper use of personal protective equipment and following standard operating procedures.
- The ability to implement basic emergency decontamination procedures.

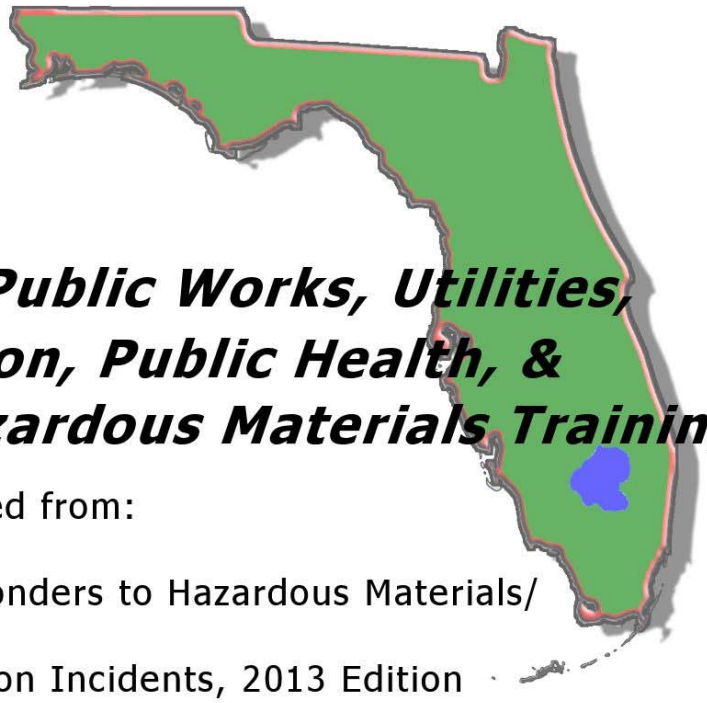
Refresher Training

Refresher training is recommended to occur on an annual basis.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**



Guidelines for Public Works, Utilities, Transportation, Public Health, & General Employee Hazardous Materials Training

Developed from:

NFPA 472 Competence of Responders to Hazardous Materials/

Weapons of Mass Destruction Incidents, 2013 Edition

Florida Division of Emergency Management

2015 Edition

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Guidelines for Public Works, Utilities, Transportation, Public Health and General Employees Hazardous Materials Training

Introduction

Employees who are not specifically addressed by the Florida State Emergency Response Commission shall be trained to meet the competencies of the awareness level. Awareness level trained personnel shall be trained to meet the requirements for the first responder at the awareness level, as defined in OSHA 29 CFR 1910.120 (q)(i), and meet the competencies in these guidelines taken from NFPA 472, Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 edition.

Should the employee's role require a level of competency at the operations level, then the individual will be trained to the operational competencies defined in the second portion of these guidelines. If their role requires a response that would be defined as hazardous materials technician, the technician guidelines available as a separate document would be used to define the recommended competencies and training guidelines.

Purpose

The purpose of these guidelines is to specify minimum competencies required for those who encounter or respond to hazardous materials/WMD incidents and necessary for a risk-based response to these incidents. The training guidelines and resulting competencies herein shall help reduce the numbers of accidents, injuries, and illnesses during hazardous materials/WMD incidents and shall help prevent exposure to hazardous materials/WMD, thus reducing the possibility of fatalities, illness, and disabilities to those who accidently or intentionally encounter an incident.

It shall not be the intention of these guidelines to restrict any organization/jurisdiction from exceeding these minimum requirements.

Definition of a Hazardous Materials Awareness Trained Personnel

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.

In addition, Awareness Trained Personnel are required to have:

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify the hazardous substances, if possible.

- An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
- The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

Definition of Hazardous Materials Operations Trained Personnel

Persons who respond to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

In addition, Operations Trained Personnel are required to have:

- Knowledge of the basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment provided to the first responder operational level.
- An understanding of basic hazardous materials terms.
- Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
- Know how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

Goal

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 required tasks safely and effectively.

Awareness Level Tasks

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 and response 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.

    a. Initiate protective actions.

    b. Initiate the notification process.

Operations Level Tasks

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; 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

Related Standards

- OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/1999)
- NFPA 472 Standards for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition.

Training Methodology Recommendations

Hazardous Materials Awareness training can take place as an on-line program, traditional classroom setting, or a combination of both. The training should include specifics of the workplace and/or additional objectives required by the authority having jurisdiction (AHJ). It is recommended that the training include a table top or field activity involving working within an incident command structure.

It is recommended that the individual delivering First Responder Programs demonstrate competency at least one level above the planned training program delivery. The instructor should also be competent in adult instructional techniques.

Hazardous Materials Operations training is recommended to take place in a traditional classroom setting. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and shall include any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, exercises, and a field activity that will include working within an incident command structure.

It is recommended that the individual delivering this training program demonstrate competency at least one level above the planned training program delivery. An Instructor delivering an Awareness Level program should be competent at the Operations Level or above. An Instructor providing an Operations Level Training should, at a minimum, is competent at the Technicians Level. The instructor should also be competent in adult instructional techniques.

Acronyms

AFFF – Aqueous Film-forming Foam

AHJ – Authority Having Jurisdiction

APR – Air Purifying Respirator

CHEMTREC – Chemical Transportation Emergency Center

CANUTEC – Canadian Transport Emergency Center

DOT – Department of Transportation

EOD – Explosive Ordinance Disposal

FBI – Federal Bureau of Investigation

HME – Homemade Explosive

ICS – Incident Command System

IED – Improvised Explosive Devices

MC – Motor Carrier

MSDS – Materials Safety Data Sheet (now Safety Data Sheets)

NBSCAB – National Bomb Squad Commander Advisory Board

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Association

PAPR – Powered Air Purifying Respirator

PCP – Pest Control Product

PPE – Personal Protective Equipment

SCBA – Self Contained Breathing Apparatus

SDS – Safety Data Sheet

SETIQ – Sistema de Emergencia para la Transportacion de la Industria Quimca (Transportation for Chemical Industry, Mexico)

UN/NA – United Nations/North America

UN/DOT – United Nations/Department of Transportation

VOC – Volatile Organic Compounds

WMD – Weapons of Mass Destruction

These guidelines are developed to provide a format for training of awareness level personnel.

AWARENESS LEVEL TRAINING

AWARE 1 Analyzing the Incident

AWARE 1.1 Detecting the Presence of Hazardous Materials/WMD

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

1. Definitions of both hazardous material (or dangerous goods, in Canada) and WMD
2. UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division.
3. The Determine the hazards associated with each hazard class and division.
4. Difference between hazardous materials/WMD incidents and other emergencies
5. Occupancies and locations in the community where hazardous materials/WMD found
6. Container shapes that can indicate the presence of hazardous materials/WMD
7. Facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
    a. Transportation markings
    b. NFPA 704
    c. Military hazardous materials/WMD markings

d. Special hazard communication markings

e. Pipeline markings

f. Container markings

8. NFPA 704 marking and describe the significance of the colors, numbers, and special symbols
9. U.S. and Canadian placards and labels that indicate hazardous materials/WMD
10. Basic information on material safety data sheets (MSDS) and shipping papers for hazardous materials including the location and sections in each.
11. Other clues to include sight, sound, and odor and the limitations of using the senses in determining the presence or absence of hazardous materials/WMD
12. Types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD
13. The difference between a chemical and a biological incident
14. Indicators of possible criminal or terrorist activity involving chemical agents, biological agents, radiologic agents, illicit laboratories (clandestine laboratories, weapons lab, ricin lab) explosives, and secondary devices.

AWARE 1.2 Surveying Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incidents, 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, identify:

1. Difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in transportation
2. Sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation
3. Sources for obtaining the names of hazardous materials/WMD at a facility

AWARE 1.3 Collecting Hazard Information

Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), 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 identify:

1. Methods for determining the guidebook page for a hazardous material/WMD
2. General types of hazards found on each guidebook page

AWARE 2 Implementing the Planned Response

AWARE 2.1 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,* identify the actions to be taken to protect themselves and others and to control access to the scene by completing the following requirements, identify:

1. The location of both the emergency response plan and/or standard operating procedures
2. The role of the awareness level personnel during hazardous materials/WMD incidents, including precautions taken to protect themselves, others, and providing emergency medical care to victims of hazardous materials/WMD incidents.
3. The following basic precautions to be taken to protect themselves and others in hazardous materials/WMD incidents, identify:
    a. The precautions necessary when providing emergency medical care to victims of hazardous materials/WMD incidents
    b. Typical ignition sources found at the scene of hazardous materials/WMD incidents
    c. Ways hazardous materials/WMD are harmful to people, the environment, and property
    d. 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. 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

AWARE 2.2 Initiating the Notification Process

Given scenarios involving hazardous materials/WMD incidents, identify the initial notifications to be made and how to make them, consistent with the AHJ.

OPERATIONS LEVEL TRAINING

OPS 1 Analyzing the Incident.

OPS 1.1 Surveying Hazardous Materials/WMD Incidents

Given scenarios involving hazardous materials/WMD incidents collect information about the incident to identify the containers, the materials involved, the surrounding conditions, and whether hazardous materials/WMD have been released.

OPS 1.1.1 Given three examples each of liquid, gas, and solid hazardous material or WMD, including various hazard classes identify the general shapes of containers in which the hazardous materials/WMD are typically found.

1. Given examples of the following tank cars identify each tank car by type, as follows:
    a. Cryogenic liquid tank cars
    b. Non-pressure tank cars (general service or low pressure cars)
    c. Pressure tank cars
2. Given examples of the following intermodal tanks identify each intermodal tank by type, as follows:
    a. Non-pressure intermodal tanks
    b. Pressure intermodal tanks

c. Specialized intermodal tanks, including Cryogenic intermodal tanks and Tube modules

3. Given examples of the following cargo tanks identify each cargo tank by type, as follows:
   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 chemical tanks
   g. Non-pressure liquid tanks
4. Given examples of the following storage tanks identify each tank by type, as follows:
   a. Cryogenic liquid tank
   b. Non-pressure tank
   c. Pressure tank
5. Given examples of the following non-bulk packaging identify each package by type, as follows:
   a. Bags
   b. Carboys
   c. Cylinders
   d. Drums
   e. Dewar flask (cryogenic liquids)
6. Given examples of the following packaging identify the characteristics of each Intermediate bulk container (IBC) and ton container.
7. Given examples of the following radioactive material packages identify the characteristics of each container or package by type, as follows:
   a. Excepted
   b. Industrial
   c. Type A
   d. Type B
   e. Type C

OPS 1.1.2 Given examples of containers identify the markings that differentiate one container from another.

Given examples of the following marked transport vehicles and their corresponding shipping papers 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

OPS 1.1.2.2 Given examples of facility containers identify the markings indicating container size, product contained, and/or site identification numbers.

OPS 1.1.3 Given examples of hazardous materials incidents identify the name(s) of the hazardous material(s).

1. Identify the following information on a pipeline marker:
   a. Emergency telephone number
   b. Owner
   c. Product
2. Given a pesticide label identify each of the following pieces of information, then match the piece of information to its significance in surveying hazardous materials incidents:
   a. Active ingredient
   b. Hazard statement
   c. Name of pesticide
   d. Pest control product (PCP) number (in Canada)
   e. Precautionary statement
   f. Signal word
3. Given a label for a radioactive material identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable.

OPS 1.1.4 Identify and list the surrounding conditions that should be noted when a hazardous materials/WMD incident is surveyed.

OPS 1.1.5 Describe ways to verify information obtained from the survey of a hazardous materials/WMD incident.

OPS 1.1.6 Identify at least three additional hazards that could be associated with an incident involving terrorist or criminal activities.

OPS 1.2 Collecting Hazard and Response Information

OPS 1.2.1 Given scenarios involving known hazardous materials/WMD collect hazard and response information using MSDS/SDS, CHEMTREC/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/SDS in an emergency
3. Using an MSDS/SDS 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

OPS 1.3 Predicting the Likely Behavior of a Material and Its Container

OPS 1.3.1 Given scenarios involving hazardous materials/WMD incidents, each with a single hazardous material/WMD 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 range
      v. Flash point
      vi. Particle size
      vii. Persistence
      viii. Physical state
      ix. Specific gravity
      x. Toxic products of combustion
      xi. Vapor density
      xii. Vapor pressure
      xiii. Water solubility
      xiv. (Auto) Ignition temperature
      xv. Radiation (ionizing and non-ionizing)
   b. Identify the differences between the following terms:
      i. Contamination & secondary contamination
      ii. Exposure & contamination
      iii. Exposure & hazard
      iv. Infectious & contagious
      v. Acute effects & chronic effects
      vi. Acute & 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. Toxic
    i. Sensitizer, allergen
    j. Target organ effects
9. Given the following, identify the corresponding UN/DOT hazard class and division:
    a. Blood agents
    b. Choking agents
    c. Irritants (riot control agents)
    d. Nerve agents
    e. Radiological materials
    f. Vesicants (blister agents)
    g. Biological agents and biological toxins

OPS 1.4 Estimating Potential Harm

OPS 1.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 2 Planning the Response

OPS 2.1 Describing Response Objectives

OPS 2.1.1 Given at least two scenarios involving hazardous materials/WMD incidents 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 protected with 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

OPS 2.2 Identifying Action Options

OPS 2.2.1 Given examples of hazardous materials/WMD incidents (facility and transportation 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

OPS 2.3 Determining Suitability of Personal Protective Equipment

OPS 2.3.1 Given examples of hazardous materials/WMD incidents, including the names of the hazardous materials/WMD involved and the anticipated type of exposure 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

OPS 2.4 Identifying Decontamination Issues

OPS 2.4.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 3 Implementing the Planned Response

OPS 3.1 Establishing Scene Control

OPS 3.1.1 Given two scenarios involving hazardous materials/WMD incidents explain how to establish and maintain scene control, including control zones and emergency decontamination, 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 either a Hazardous material incidents or a Hazardous materials/WMD incidents involving criminal activities
6. Identify the procedures for ensuring coordinated communication between responders and to the public

OPS 3.2 Preserving Evidence

OPS 3.2.1 Given two scenarios involving hazardous materials/WMD incidents describe the process to preserve evidence as listed in the emergency response plan and/or standard operating procedures.

OPS 3.3 Initiating the Incident Command System.

OPS 3.3.1 Given scenarios involving hazardous materials/WMD incidents 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

OPS 3.4 Using Personal Protective Equipment

OPS 3.4.1 Given the personal protective equipment provided by the AHJ 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

OPS 4 Evaluating Progress

OPS 4.1 Evaluating the Status of Planned Response

OPS 4.1.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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

OPS 4.2 Communicating the Status of Planned Response

OPS 4.2.1 Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan 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.

Summary: Public Works, Utilities, Transportation, Public Health, and General Employee Guidelines

Audience

These guidelines were developed for persons who respond accidently or purposefully to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

Prerequisites

Awareness level training is required prior to the completion of the Operations level.

Training

Operations Level training is recommended to take place in a traditional classroom setting and include opportunities for field study and application. The training should include any additional objectives required by the authority having jurisdiction (AHJ) and any additional training to meet applicable governmental occupational health and safety regulations. It is recommended that the training include didactic material, table top activities, large and small exercise groups, and a field activity that will include working within an incident command structure.

The competencies found in these guidelines include:

- An understanding of hazardous materials terms, basic hazard and risk assessment, and the role of the Firefighter at a hazardous materials incident.
- The ability to perform basic control. Containment and/or confinement techniques with proper use of personal protective equipment and following standard operating procedures.
- The ability to implement basic decontamination procedures.

Refresher Training

Refresher training is recommended to occur on an annual basis.

Florida

EMERGENCY RESPONSE COMMISSION

for **Hazardous Materials**

Guidelines for Hazardous Materials

Instructor Qualifications

Florida Division of Emergency Management

2015 Edition

Guidelines for Instructor Qualifications of Hazardous Materials Trainers

Instructor Qualifications

There are a number of locations to determine the qualification of an instructor to teach hazardous materials based courses. These included evaluating the qualifications found in OSHA, NFPA, National Fire Academy, and Florida Administrate Code.

OSHA

Evaluating the subject from a National perspective, OSHA would be the logical choice for determining qualifications for hazardous materials trainers. OSHA 1910.120 states: *Qualifications for trainers. Trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.*

NFPA

In NFPA 472 it is recommended that the *individual delivering this training program demonstrate competency at least one level above the planned training program delivery*. An Instructor providing an Operations Level Training should, at a minimum, is competent at the Technicians Level. In addition NFPA has developed the NFPA 1041: Standard for Fire Service Instructor Professional Qualifications. This standard identifies the minimum job performance requirements for fire and emergency service instructors.

National Fire Academy

The NFA expects that instructors meet criteria in experience, education, reference and certification.

1. **Experience** – Instructors must have sufficient experience in the subject area to relate to the students. They must also have proven successful teaching experience necessary to properly deliver the subject in an organized professional manner.
2. **Education** – Instructors must have requirements that are specified for each course. All degree requirements must be satisfied from nationally- and/or regionally-accredited institutions recognized by the U.S. Department of Education.
3. **Reference** – Instructors must have three references from persons who are knowledgeable about an instructor's character and your teaching ability. One reference letter should be from the department or agency head in your organization or certifying organization.
4. **Certification** - It is desirable that instructor are certified through one of the following:
    a. An established training organization or association.
    b. Completion of the NFA's Fire Service Instructional Methodology course.
    c. Completion of an instructional methods course from a college or university.

Florida Administrative Code

In the State of Florida the Administrative Code 69A-37.065 Programs of Study and Vocational Courses, Instructor qualifications are identified as:

> An instructor providing training under this section must be qualified by the Bureau of Fire Standards and Training (the Bureau).

All instructors shall submit an Instructor Approval Request Form and be approved by the Bureau prior to the first day of the course.

Qualified instructors include:

Adjunct Instructor:

1. Instructors with requisite faculty credentials for the academic institution that is registered in the Florida Department of Education Statewide Course Numbering System to teach the course; or
2. Instructors with requisite faculty credentials as determined by the United States Fire Administration – National Fire Academy; or
3. Instructors with requisite faculty credentials as determined by the respective regionally accredited or nationally accredited university or college; or
4. Instructors who hold an active Single Course Exemption Certification issued by the Division as outlined in subsection 69A-37.059(4), F.A.C.; or
5. Instructors who have completed the required courses under this section which is recorded in the Bureau's database.

Lead Instructor:

Instructors who have completed the required courses under this section, and, have previously taught this course as an Adjunct Instructor which was recorded in the Bureau's database. These instructors are known as *Lead Instructors*.

Qualities of a Hazard Materials Instructor

It is recommended that, in addition to having professional qualifications, instructors also have the following qualities:

- **Job knowledge –** thorough knowledge of the content to be taught; knowledge of how the information, techniques and principles apply to performing the job; understanding the difficulties and problems that arise on the job; and specific training or education in the subject matter being taught.
- **Job experience –** actual work experience directly related to the subject matter (have performed the job being taught) and experience in hazardous materials response.
- **Training knowledge –** successful completion of an instructor training course that covers the principles of learning, methods and sequencing of instruction, methods of testing and evaluation, preparing performance objectives and lesson plans, training liability and oral and written communication skills.
- **Personal qualities –** patience and understanding, enjoyment of teaching, respect for student and flexibility.
- **Sensitivity** to cultural diversity among students.

Acronyms Used in the Training Guidelines

AFFF – Aqueous Film-forming Foam

AHJ – Authority Having Jurisdiction

ALS – Advanced Life Support

APR – Air Purifying Respirator

BLS – Basic Life Support

CHEMTREC – Chemical Transportation Emergency Center

CANUTEC – Canadian Transport Emergency Center

CFR – Code of Federal Regulations

CPM – Counts per minute

DOT – Department of Transportation

EMS – Emergency Medical Services

EOD – Explosive Ordinance Disposal

FBI – Federal Bureau of Investigation

HME – Homemade Explosive

ICS – Incident Command System

IDLH – Immediately Dangerous to Life and Health

IED – Improvised Explosive Devices

JIC – Joint Information Center

LC50 – Lethal Concentration 50

LD50 – Lethal Dose 50

MC – Motor Carrier

MCI – Mass Casualty Incident

MMRS – Metropolitan Medical Response System

Mrem – Millirem

MSDS – Materials Safety Data Sheet (now Safety Data Sheets)

NBSCAB – National Bomb Squad Commander Advisory Board

NFPA – National Fire Protection Association

NIMS – National Incident Management System

OSHA – Occupational Safety and Health Association

PAPR – Powered Air Purifying Respirator

PCP – Pest Control Product

PEL – Permissible Exposure Limit

PPE – Personal Protective Equipment

Ppm – parts per million

RDD – Radiological Dispersal Device

RED – Radiological Exposure Device

REL – Relative Exposure Limit

REM – Roentgen Equivalent Man

RSO – Radiation Safety Officer

SCBA – Self Contained Breathing Apparatus

SDS – Safety Data Sheet

SETIQ – Sistema de Emergencia para la Transportacion de la Industria Quimca (Transportation for Chemical Industry, Mexico)

TIC – Toxic Industrial Chemical

TLV-C – Threshold Limit Value – Ceiling

TLV-STEL – Threshold Limit Value – Short Term Exposure Limit

TLV-TWA – Threshold Limit Value – Time Weighted Average

UN/NA – United Nations/North America

UN/DOT – United Nations/Department of Transportation

VOC – Volatile Organic Compounds

WMD – Weapons of Mass Destruction

Definitions to Terms Used in the General Training Guidelines

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

Agency-Specific Competencies - The knowledge, skills, and judgment needed by operations level responders who have completed the operations level competencies and who are designated by the authority having jurisdiction to respond to releases or potential releases of a specific group of WMD agents.

Allied Professional - That person who possesses the knowledge, skills, and technical competence to provide assistance in the selection, implementation, and evaluation of mission-specific tasks at hazardous materials/weapons of mass destruction (WMD) incident.

Analyze - The process of identifying a hazardous materials/weapons of mass destruction (WMD) problem and determining likely behavior and harm within the training and capabilities of the emergency responder.

Approved - Acceptable to the authority having jurisdiction.

Individual Area of Specialization - The qualifications or functions of a specific job(s) associated with chemicals and/or containers used within an organization.

> **Individual Area of Specialization** - The qualifications or functions of a specific job(s) associated with chemicals and/or containers used within an organization.
>
> **Organization's Area of Specialization** - Any chemicals or containers used by the specialist employee's employer.

Authority Having Jurisdiction (AHJ) - An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

Awareness Level Personnel - (29 CFR 1910.120: First Responder at the Awareness Level) Personnel 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/weapons of mass destruction (WMD), protect themselves, call for trained personnel, and secure the scene.

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

CANUTEC - The Canadian Transport Emergency Center, operated by Transport Canada, which provides emergency response information and assistance on a 24-hour basis for responders to hazardous materials/weapons of mass destruction (WMD) incidents.

CHEMTREC - The Chemical Transportation Emergency Response Center, a public service of the American Chemistry Council, which provides emergency response information and assistance on a 24-hour basis for responders to hazardous materials/weapons of mass destruction (WMD) incidents.

Competence - Possessing knowledge, skills, and judgment needed to perform indicated objectives.

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

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

Confinement - Those procedures taken to keep a material, once released, in a defined or local area.

Container - A receptacle used for storing or transporting material of any kind.

Containment - The actions taken to keep a material in its container (e.g., stop a release of the material or reduce the amount being released).

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

Contamination - The process of transferring a hazardous material, or the hazardous component of a weapon of mass destruction (WMD), from its source to people, animals, the environment, or equipment, that can act as a carrier.

Cross Contamination – The process by which a contaminant is carried out of the hot zone and contaminates people, animals, the environment, or equipment.

Control - The procedures, techniques, and methods used in the mitigation of hazardous materials/weapons of mass destruction (WMD) incidents, including containment, extinguishment, and confinement.

Control Zones - The areas at hazardous materials/weapons of mass destruction (WMD) incidents within an established/controlled perimeter that are designated based upon safety and the degree of hazard.

> **Cold Zone** - The control zone of hazardous materials/weapons of mass destruction (WMD) incidents that contains the incident command post and such other support functions as are deemed necessary to control the incident.
>
> **Decontamination Corridor** - The area usually located within the warm zone where decontamination is performed.
>
> **Hot Zone** - The control zone immediately surrounding hazardous materials/weapons of mass destruction (WMD) incidents, which extends far enough to prevent adverse effects of hazards to personnel outside the zone.
>
> **Warm Zone** - The control zone at hazardous materials/weapons of mass destruction (WMD) incidents where personnel and equipment decontamination and hot zone support takes place.

Coordination - The process used to get people, who could represent different agencies, to work together integrally and harmoniously in a common action or effort.

Core Competencies - The knowledge, skills, and judgment needed by operations level responders who respond to releases or potential releases of hazardous materials/weapons of mass destruction (WMD).

Decontamination - The physical and/or chemical process of reducing and preventing the spread of contaminants from people, animals, the environment, or equipment involved at hazardous materials/weapons of mass destruction (WMD) incidents.

Emergency Decontamination - The physical process of immediately reducing contamination of individuals in potentially life-threatening situations with or without the formal establishment of a decontamination corridor.

Gross Decontamination - The phase of the decontamination process during which the amount of surface contaminants is significantly reduced.

Mass Decontamination - The physical process of reducing or removing surface contaminants from large numbers of victims in potentially life-threatening situations in the fastest time possible.

Technical Decontamination - The planned and systematic process of reducing contamination to a level that is as low as reasonably achievable.

Degradation - (1) A chemical action involving the molecular breakdown of a protective clothing material or equipment due to contact with a chemical. (2) The molecular breakdown of the spilled or released material to render it less hazardous during control operations.

Demonstrate - To show by actual performance.

Describe - To explain verbally or in writing using standard terms recognized by the hazardous materials/weapons of mass destruction (WMD) response community.

Dispersal Device - Any weapon or combination of mechanical, electrical, or pressurized components that is designed, intended, or used to cause death or serious bodily injury through the release, dissemination, or impact of toxic or poisonous chemicals or their precursors, biological agent, toxin or vector, or radioactive material.

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

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

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

Emergency Medical Services Responders to Hazardous Materials/Weapon of Mass Destruction at the ALS Level (ALS Level Responder) - In addition to their ALS certification, operations level responders who are assigned EMS mission-specific responsibilities at hazardous materials/WMD incidents shall be trained to meet all competencies of NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, Chapters 4 and 5, and all competencies for the assigned responsibilities in NFPA 473, Chapters 4 and 5.

Emergency Medical Services Responders to Hazardous Materials/Weapon of Mass Destruction at the BLS Level (BLS Level Responder) - In addition to their BLS certification, operations level responders who are assigned EMS mission-specific responsibilities at hazardous materials/WMD incidents shall be trained to meet all competencies of NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, Chapters 4 and 5, and all competencies for the assigned responsibilities in NFPA 473, Chapter 4.

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

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

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

Emergency Response Guidebook (ERG) - A reference book, written in plain language, to guide emergency responders in their initial actions at the incident scene.

Endangered Area - The actual or potential area of exposure associated with the release of a hazardous material/weapon of mass destruction (WMD).

Evaluate - The process of assessing or judging the effectiveness of a response operation or course of act ion within the training and capabilities of the emergency responder.

Example - An illustration of a problem serving to show the application of a rule, principle, or method (e.g., past incidents, simulated incidents, parameters, pictures, and diagrams).

Exposure - The process by which people, animals, the environment, and equipment are subjected to or come in contact with a hazardous material/weapon of mass destruction (WMD).

Fissile Material - Material whose atoms are capable of nuclear fission (capable of being split).

Hazard/Hazardous - Capable of posing an unreasonable risk to health, safety, or the environment; capable of causing harm.

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

Hazardous Materials Branch/Group - The function within an overall incident management system that deals with the mitigation and control of the hazardous materials/weapons of mass destruction (WMD) portion of an incident.

Hazardous Materials Officer - (NIMS: Hazardous Materials Branch Director/Group supervisor.) The person who is responsible for directing and coordinating all operations involving hazardous materials/weapons of mass destruction (WMD) as assigned by the incident commander.

Hazardous Materials Response Team (HMRT) - An organized group of trained response personnel operating under an emergency response plan and applicable standard operating procedures who perform hazardous material technician level skills at hazardous materials/weapons of mass destruction (WMD) incidents.

Hazardous Materials Safety Officer - (NIMS: Assistant Safety Officer—Hazardous Material.) The person who works within an incident management system (IMS) (specifically, the hazardous materials branch/group) to ensure that recognized hazardous materials/WMD safe practices are followed at hazardous materials/weapons of mass destruction (WMD) incidents.

Hazardous Materials Technician - Person who responds to hazardous materials/weapons of mass destruction (WMD) incidents using a risk based response process by which they analyze a problem involving hazardous materials/weapons of mass destruction (WMD), select applicable

decontamination procedures, and control a release using specialized protective clothing and control equipment.

Identify - To select or indicate verbally or in writing using standard terms to establish the fact of an item being the same as the one described.

Incident - An emergency involving the release or potential release of hazardous materials/weapons of mass destruction (WMD).

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

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

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

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

Match - To provide with a counterpart.

Material Safety Data Sheet (MSDS) or Safety Data Sheet(SDS) - A form, provided by manufacturers and compounders (blenders) of chemicals, containing information about chemical composition, physical and chemical properties, health and safety hazards, emergency response, and waste disposal of the material.

Medical Control - The physician or designee providing direction for patient care activities in the prehospital setting.

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

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

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

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

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

Monitoring Equipment - Instruments and devices used to identify and quantify contaminants.

Objective - A goal that is achieved through the attainment of a skill, knowledge, or both, that can be observed or measured.

Operations Level Responders - Persons who respond to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

Packaging - Any container that holds a material (hazardous or nonhazardous)

> **Bulk Packaging** - Any packaging, including transport vehicles, having a liquid capacity of more than 119 gal (450 L), a solids capacity of more than 882 lb. (400 kg), or a compressed gas water capacity of more than 1001 lb. (454 kg).
>
> **Non-bulk Packaging** - Any packaging having a liquid capacity of 119 gal (450 L) or less, a solids capacity of 882 lb. (400 kg) or less, or a compressed gas water capacity of 1001 lbs. (454 kg) or less.
>
> **Radioactive Materials Packaging** - Any packaging for radioactive materials including excepted packaging, industrial packaging, Type A, Type B, and Type C packaging.

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

Penetration - The movement of a material through a suit's closures, such as zippers, buttonholes, seams, flaps, or other design features of chemical-protective clothing, and through punctures, cuts, and tears.

Permeation - A chemical action involving the movement of chemicals, on a molecular level, through intact material.

Personal Protective Equipment (PPE) - The equipment provided to shield or isolate a person from the chemical, physical, and thermal hazards that can be encountered at hazardous materials/weapons of mass destruction (WMD) incidents.

Plan

> **Emergency Response Plan** - A plan developed by the authority having jurisdiction, with the cooperation of all participating agencies and organizations, that details specific actions to be performed by all personnel who are expected to respond during an emergency.
>
> **Incident Action Plan** - An oral or written plan approved by the incident commander containing general objectives reflecting the overall strategy for managing an incident.
>
> **Site Safety and Control Plan** - A site safety and control plan should be completed and approved by the hazardous materials officer, the hazardous materials safety officer, and

the incident commander for inclusion in the incident action plan. The plan must be briefed to personnel operating within the hot zone by the hazardous materials safety officer or the hazardous materials officer prior to entry mission initiation. The initial site safety and control plan for the first operational period can be written or oral. The plan should be documented as soon as resources allow.

Planned Response - The incident action plan, with the site safety and control plan, consistent with the emergency response plan and/or standard operating procedures for a specific hazardous materials/weapon of mass destruction (WMD) incident.

Predict - The process of estimating or forecasting the future behavior of a hazardous materials/weapons of mass destruction container and/or its contents within the training and capabilities of the emergency responder.

Protective Clothing - Equipment designed to protect the wearer from heat and/or from hazardous materials, or from the hazardous component of a weapon of mass destruction contacting the skin or eyes.

Chemical-Protective Clothing - Items made from chemical-resistive materials, such as clothing, hood, boots, and gloves, that are designed and configured to protect the wearer's torso, head, arms, legs, hands, and feet from hazardous materials.

High Temperature–Protective Clothing - Protective clothing designed to protect the wearer for short-term high temperature exposures

Liquid Splash–Protective Clothing - The garment portion of a chemical-protective clothing ensemble that is designed and configured to protect the wearer against chemical liquid splashes but not against chemical vapors or gases.

Structural Fire-Fighting Protective Clothing - The fire-resistant protective clothing normally worn by fire fighters during structural fire-fighting operations, which includes a helmet, coat, pants, boots, gloves, PASS device, and a fire-resistant hood to cover parts of the head and neck not protected by the helmet and respirator face piece.

Vapor-Protective Clothing - The garment portion of a chemical-protective clothing ensemble that is designed and configured to protect the wearer against chemical vapors or gases.

Protocol - A guideline for a series of sequential steps directing patient treatment.

Qualified - Having knowledge of the installation, construction, or operation of apparatus and the hazards involved.

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

Respiratory Protection - Equipment designed to protect the wearer from the inhalation of contaminants.

Response - That portion of incident management in which personnel are involved in controlling hazardous materials/weapons of mass destruction (WMD) incidents.

Risk-Based Response Process - Systematic process by which responders analyze a problem involving hazardous materials/weapons of mass destruction (WMD), assess the hazards, evaluate the potential consequences, and determine appropriate response actions based upon facts, science, and the circumstances of the incident.

Safely - To perform the assigned tasks without injury to self or others, to the environment, or to property.

Scenario - A sequence or synopsis of actual or imagined events used in the field or classroom to provide information necessary to meet student competencies; can be based upon threat assessment.

Shall - Indicates a mandatory requirement.

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

SETIQ - The Emergency Transportation System for the Chemical Industry in Mexico.

Specialist Employees

> **Specialist Employee A** - That person who is specifically trained to handle incidents involving chemicals or containers for chemicals used in the organization's area of specialization.
>
> **Specialist Employee B** - That person who, in the course of his or her regular job duties, works with or is trained in the hazards of specific chemicals or containers within the individual's area of specialization.
>
> **Specialist Employee C** - That person who responds to emergencies involving chemicals and/or containers within the organization's area of specialization.

Stabilization - The point in an incident when the adverse behavior of the hazardous material, or the hazardous component of a weapon of mass destruction (WMD), is controlled.

Standard - A document, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Non-mandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the Manual of Style for NFPA Technical Committee Documents.

Termination - That portion of incident management after the cessation of tactical operations in which personnel are involved in documenting safety procedures, site operations, hazards faced, and lessons learned from the incident.

UN/NA Identification Number - The four-digit number assigned to a hazardous material/weapon of mass destruction (WMD), which is used to identify and cross-reference products in the transportation mode.

Weapon of Mass Destruction (WMD) - (1) Any destructive device, such as any explosive, incendiary, or poison gas bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce (7 grams), mine, or device similar to the preceding description; (2) any weapon involving toxic or poisonous chemicals; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.

> **Radiological Weapons of Mass Destruction**
>
> **Improvised Nuclear Device (IND)** - An illicit nuclear weapon that is bought, stolen, or otherwise obtained from a nuclear state (that is, a national government with nuclear weapons), or a weapon fabricated from fissile material that is capable of producing a nuclear explosion.
>
> **Radiation Dispersal Device (RDD)** - A device designed to spread radioactive material through a detonation of conventional explosives or other (non-nuclear) means; also referred to as a “dirty bomb.”

Radiation Exposure Device (RED) - Radioactive material, either as a sealed source or as material within some type of container, or a radiation-generating device, such as an x-ray device, that directly exposes people to ionizing radiation; the term is interchangeable with the term radiological exposure device or radiation emitting device.

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