



STATE
EMERGENCY
RESPONSE
COMMISSION
for hazardous materials

Florida Guidelines for Hazardous Materials Training



Florida
DIVISION
OF
EMERGENCY
MANAGEMENT



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Introduction

The Florida State Emergency Response Commission (SERC) has been challenged by the need for consistent guidance in the training of responders State-wide and delegated the SERC Training Task Force with developing training guidelines compliant with the Superfund Amendment and Reauthorization Act of 1986 (SARA Title I, Section 126). This federal law required the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) to promulgate regulations (29 CFR 1910.120 and 40 CFR 311) to protect workers from the effects of exposure to hazardous materials.

The National Emergency Training Center (NETC) developed the Guidelines for Public Sector Hazardous Materials Training to provide a resource for hazardous materials training, as part of the public service collaboration of the Federal Emergency Management Agency and the U.S. Department of Transportation under the Hazardous Materials Emergency Preparedness Grant Program.

Along with the federal hazardous materials emergency response-training mandate, the nationally recognized consensus standards established by the National Fire Protection Association (NFPA) must be considered. NFPA 471, "Recommended Practice for Responding to Hazardous Materials Incidents, (2002 Edition)" provides minimum requirements to consider when responding to hazardous materials incidents. NFPA 472, "Standard for Professional Competence of Responders to Hazardous Materials Incidents, (2002 Edition)" provides explicit detailed objectives for training responders to hazardous materials incidents. NFPA 472 is cited in 29 CFR 1910.120 as an "excellent resource" to aid emergency response organizations in developing training programs. NFPA 473, "Competencies for Emergency Medical Service (EMS) Personnel Responding to Hazardous Materials Incidents, (2002 Edition)" provides similar guidance for emergency medical services training programs.

SARA Title III, Section 303 states: ...Each emergency plan shall include training programs, including schedules for training of local emergency response and medical personnel. Each plan should also describe training requirements for all Hazardous Materials Emergency Response Personnel. Each plan should list and describe the training programs to support these requirements...

The Need to Train

Employees who respond to hazardous materials emergencies must be properly trained to perform their jobs safely and efficiently. Their employers are responsible for ensuring the health and safety of the responding personnel as well as the protection of the public and the communities served.

Training managers face a significant challenge in ensuring that all responding personnel are fully trained and prepared, while working within existing limited resources and conflicting priorities.

Employer's Legal Responsibilities

OSHA 29 CFR 1910.120(q) and EPA 40 CFR 311 require that emergency response employees be completely trained before they perform at hazardous materials emergencies. The employer must certify annually that each employee has successfully completed the required training. The method used to demonstrate competency for certification of training must be recorded and maintained by the employer. Important concepts to remember are:

1. The chief or director is responsible for determining the appropriate level of training required, based on actions required of employees as stated in the organizations SOP's.

2. The chief or director is responsible for implementing the required training or certifying that employees of the organization have the competencies required. Documentation of training is critical.
3. OSHA 29 CFR 1910.120(q) rules apply to all individuals and agencies that are expected to respond to an emergency involving hazardous materials, that is, career or volunteer, fire, emergency medical services (EMS), law enforcement, or hospital personnel.

OSHA 29 CFR 1910.120 and EPA 40 CFR 311 apply to employers whose employees are engaged in emergency response to hazardous materials incidents. Employer responsibilities under these regulations fall into four primary areas:

1. Development of an emergency response plan.
2. Development of specific procedures for handling hazardous materials incidents.
3. Training requirements.
4. Health and safety requirements (medical monitoring for the use of chemical protective clothing and exposure records).

The previously described laws, regulations, and consensus standards provide the reasonable, prudent, and appropriate guidance which will likely result in the "Standard of Care" to which emergency responders may be held accountable. In the event an incident that results in responders taking action contrary to the "Guidance," liability for personal injury or property damage could fall on the emergency response organization. In addition, if the responder is harmed as a result of the employer's failure to properly train and equip the emergency responder, then the responder may initiate litigation for compensation.

The goal of an emergency response organization should be to provide competent, reasonable, prudent, and appropriate actions, consistent with the applicable guidance at hazardous materials emergencies and, therefore, avoid liabilities associated with a failure to comply. Emergency Service Organizations can only provide for and effectively and efficiently protect the public and the environment if properly trained. Emergency responders must have the competency to properly mitigate a hazardous materials incident within their level of training and personnel protective equipment (PPE) consistent with local emergency response plan and organizations SOP's. The competencies specified in the SERC, Guidelines for Hazardous Materials Response Training meet the need for guidance in developing responders who will meet the demanding challenges of hazardous materials response.

Employer Training Requirements

Employers must ensure that employees receive training in emergency response to hazardous materials incidents based on their expected duties and functions. Such training must be performed before employees are permitted to perform at hazardous materials emergencies.

1. An employer is responsible for determining the appropriate level of training required based on actions required of employees as stated in the SOP's.
2. An employer is responsible for implementing the required training. Emphasis should be on achieving the required competencies for the appropriate level of response rather than on minimal requirements for length of training.
3. An employer is responsible for selecting qualified, competent instructors.
4. An employer must provide annual refresher training sufficient to maintain competencies, or employees must demonstrate required competencies annually.
5. An employer must maintain a record of demonstrated competencies including an explanation of how each competency was demonstrated. Training records must contain dates of training, student roster, curriculum outlines, demonstration checklists or performance records and evaluation tools and scores, if appropriate.

OSHA has defined the minimum number of hours for training at operations, technician and incident commander levels. However, each employer is responsible for employees being trained to competency and agencies often exceed the minimum hours of training to teach and test for competencies at the levels outlined by OSHA. The training needed to reach competency depend on the preexisting skills and experience of the trainees. Agencies frequently discover that training needs exceed the minimum required hours.

Training Guidelines

The SERC Guidelines for Hazardous Materials Training are derived from the National Emergency Training Center (NETC) Guidelines for Public Sector Hazardous Materials Training. NETC competency citations have been compared against NFPA 471, 472 and 473 for consistency and completeness.

The Guidelines are written to assist hazardous materials training managers. It assumes that users are experienced in hazardous materials training, the ability to evaluate their organization's hazard analysis and response capability as well as training requirements. The Guidelines are the minimum training appropriate for the competencies in each discipline. The Guidelines can be expanded by individual jurisdictions to better ensure effectiveness of training.

Included within these guidelines are:

1. Guidelines for Emergency Medical Service Responders Hazardous Materials Training.
2. Guidelines for Law Enforcement Hazardous Materials Training.
3. Guidelines for Fire Fighter Hazardous Materials Training.
4. Guidelines for Public Works, Utilities, Transportation, Public Health, and other Employees Hazardous Materials Training.
5. Guidelines for Hazardous Materials Technician Hazardous Materials Training.
6. Guidelines for Incident Commander Hazardous Materials Training.
7. Guidelines for Instructor Qualifications of Hazardous Materials Trainers.

Refresher Training

All employees who may respond to hazardous materials emergencies must receive refresher training on an annual basis or have experience that ensures their competency to perform their roles safely and efficiently. Employers must certify on an annual basis that employees continue to meet the performance objectives as defined in OSHA 1910.120. This is accomplished through refresher training or demonstration of competency.

It is up to the employer to determine that employees maintain their original competencies through refresher training. If it is determined that employees maintain their competency without refresher training, OSHA allows them to demonstrate this annually. If the employer decides to use demonstrated competencies instead of providing training, the employer must document how each employee demonstrated competency.

Refresher training or competency retesting requirements varies for each of the response levels. In general, refresher training should include critical skills practice, technical information updates and

refinements of incident scene coordination through field exercises simulating emergencies. Minimum hours for annual refresher training for response personnel are not specified in OSHA 1910.120. However, OSHA Interpretive Quips recognize 8-hour as the minimum refresher-training requirement HAZWOPER for site workers, recognizing that more than 8 hours may be required on an annual basis. In each of the competency sections of the training guideline, unique areas of emphasis for refresher training are noted.

Guideline History

Following the 2002 revisions to NFPA 471, *Recommended Practice for Responding to Hazardous Materials Incidents*, NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents* and NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents*, the Florida State Emergency Response Commission (SERC) saw a need to make changes to the 1994 edition of the Guidelines for Public Sector Hazardous Materials Training. The original training guidelines were developed by South Tech Fire Academy, Boynton Beach Florida, for the SERC Hazardous Materials Training Task Force under a grant from the Florida Division of Emergency Management. Emergency Response Educators and Consultants, Inc. (EREC, Inc.), Silver Springs, Florida, was contracted by the Florida Division of Emergency Management to prepare this revised document to reflect changes in OSHA 29 CFR 1910.120, NFPA 471, 472 and 473.

Disclaimer

The Florida State Emergency Response Commission (SERC) and Emergency Response Educators and Consultants, Inc. (EREC) disclaim liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of or reliance on this document. The reader of this document is warned to consider and use any and all safety precautions that might be indicated by the activities herein and to avoid potential hazards whenever possible. The reader willingly assumes all risks in connection with activities undertaken which may be referenced in this document. The SERC and EREC also make no guaranty or warranty as to the accuracy or completeness of any information published herein.

REFERENCES

OSHA, 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response. July 1, 1999 Edition.
EPA, 40 CFR 311, Worker Protection Standards for Hazardous Waste Operations and Emergency Response.
NETC, Guidelines for Public Sector Hazardous Materials Training. March 1998 Edition.
NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents. 2002 Edition
NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents. 2002 Edition
NFPA 473, Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents. 2002 Edition

FLORIDA STATE EMERGENCY RESPONSE COMMISSION

Guidelines for Emergency Medical Responders Hazardous Materials Training

October 1, 2002
~Revised~



Guidelines for Emergency Medical Service Responders Hazardous Materials Training

Emergency Medical Services Responder Level 1

Introduction

Emergency Medical Service (EMS) Responder Level 1 shall be trained to meet the requirements of the first responder at the awareness level, as defined in OSHA 29 CFR 1910.120(q)(i), and meet the competencies included in this section. In addition, EMS Level 1 shall meet the training requirements of the Florida Department of Health – Bureau of Emergency Medical Services, U.S. Occupational Health and Safety Administration, Florida Department of Environmental Protection and the U.S. Environmental Protection Agency (EPA) as appropriate for their jurisdictions.

In addition to being trained to the first responder awareness level, emergency service personnel responding to hazardous material incidents will be trained and receive regular continuing education to maintain competence in three areas: emergency medical technology, hazardous materials, and specialized topics such as hazardous materials toxicology, as approved by the Florida Department of Health. Bureau of Emergency Medical Services The training program should be a comprehensive competency-based presentation of the required subject material with applicable hands-on sessions that demonstrate the newly acquired skills.

Definition

Emergency Medical Service Responder Level 1 are those persons who in the normal course of their duties may be called upon to perform patient care activities in the cold zone (i.e. clean, or support zone) at a hazardous materials incident. EMS Level 1 shall provide pre-hospital care only to those individuals who no longer pose a significant risk of secondary contamination such as decontaminated patients in the cold zone. The role of the EMS Level 1 is to provide care only to those individuals who no longer pose a significant risk of secondary contamination (that is, a risk of contaminating others, including those providing care).

Audience

All Emergency Medical Technicians (EMT's), Paramedics, and other health professionals who in the course of their normal duties, may respond to hazardous materials emergencies either as first responders or as on-site cold zone support to the incident command structure at an incident.

Related Health, Safety and Performance Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)

EPA 40 CFR 311 Worker Protection

NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents. 2002 Edition

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

NFPA 473 Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents. 2002 Edition

NETC Guidelines for Public Sector Hazardous Materials Training. March 1998

Appropriate Methodologies

EMS Responders Level 1 training should include a combination of traditional classroom lecture with small group activities, tabletop and field exercises involving working with the incident command structure in simulated emergencies, and hands-on psychomotor skill training. Content instruction should focus on contamination hazards, treatment procedures, and incident scene roles and responsibilities.

Student activities should focus on assessment, analysis of hazards and determination of appropriate procedures. Skill training should focus on implementing procedures. Written and practical examinations are highly recommended to measure achievement in initial training and refresher programs and to support the employer's responsibility that all EMS personnel are trained to competency before being called on to perform at actual emergencies. Tabletop and field exercises should focus on acting out incident scene roles and on implementing procedures in a field environment. Refresher training should be conducted on an annual basis and focus on technical updates to changes in response protocols, SOP's, and renewal of individual response skills.

The SERC estimates that the initial entry-level training can be accomplished in approximately 8 contact hours, including the first responder awareness training, with competent instructors knowledgeable in hazardous materials response. Annual refresher training should be accomplishable with approximately 4 contact hours. However, 8 hours would be preferred.

The Florida Department of Health, Bureau of Emergency Medical Services requires the individual to re-certify every two years. It is recommended that the individual be required to demonstrate proof of refresher training consistent with existing standards and that all EMS employers and educational institutions be required to issue certificates of training for compliance with refresher hazardous materials training.

The following resources are recommended to supplement the training process:

- Local LEPC Emergency Response Plan
- Local Standard Operating Procedures
- Hawley's Condensed Chemical Dictionary. R. J. Lewis, Sr. 13th Edition. 1997
- Hazardous Chemical Data (U.S. Government)
- OSHA 29 CFR 1910.120 (Current Edition)
- NIOSH Pocket Guide (Current Edition)
- Association of American Railroads Emergency Action Guides (Current Edition)
- NFPA 471, 472, 473 (Current Edition)
- Handbook of Toxic and Hazardous Chemicals and Carcinogens. Marshall Sittig. 3rd Edition, Haz/Mat Injuries. Bradford/Stutz.
- Emergency Care for Haz/Mat Exposures .Mosby/Bronstien and Currence.

Training

All EMS Responder Level 1 personnel will be trained to the awareness level utilizing the Florida First Responder Awareness Level Hazardous Materials Training Program, National Fire Academy Program - Initial Response to Hazardous Materials Incidents: Basic Concepts or similar curricula complying with the First Responder Awareness Level as defined in 29 CFR 1910.120 and NFPA 472. Additionally, all EMS Level 1 responders will be trained to perform the EMS Level 1 competencies.

The following training objectives are recommended for the First Responder Awareness Level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

First Responder Awareness

The First Responder Awareness competencies included here for reference.

Recommended Training Objectives

AWARE-1 Given a hazardous materials incident scenario, demonstrate an understanding of the role of the first responder at the awareness level.

- AWARE-1.1** Describe the responsibility to analyze the incident to determine the hazardous materials present and the basic hazard and response information for each type of hazardous material, and demonstrate the ability to do the following:
- AWARE-1.1.1** Identify the responsibility to detect the presence of hazardous materials.
- AWARE-1.1.2** Identify the responsibilities to survey a hazardous materials incident, from a safe location, to identify the name, UN/NA identification number, or type placard applied for any hazardous material involved.
- AWARE-1.1.3** Identify the responsibility to collect hazard information from the current edition of the *North American Emergency Response Guidebook* (ERG).
- AWARE-1.2** Describe the responsibility to implement actions consistent with the local emergency response plan, the organization's SOP's and the current edition of the *North American Emergency Response Guidebook*, and demonstrate the ability to do the following:
- AWARE-1.2.1** Identify the responsibility to initiate protective actions consistent with the local emergency response plan, the organization's SOP's, and the current edition of the *North American Emergency Response Guidebook*.
- AWARE-1.2.2** Identify the responsibility to initiate the notification process specified in the local emergency response plan and the organization's SOP's.

Analyzing the Incident - Detecting the Presence of Hazardous Materials

- AWARE-2** Given incident scenarios involving facility and/or transportation situations with and without hazardous materials present, identify those situations where hazardous materials are present.
- AWARE-2.1** Identify the definition of hazardous materials.
- AWARE-2.2** Identify the USDOT Hazard Classes and divisions of hazardous materials and identify common examples of each hazard class or division.
- AWARE-2.3** Identify the primary hazards associated with each of the USDOT Hazard Classes and divisions of hazardous materials by hazard class or division.
- AWARE-2.4** Identify the difference between hazardous materials emergencies and other emergencies.
- AWARE-2.5** Identify typical occupancies and locations in the community where hazardous materials are manufactured, stored, transported, used, or disposed of.
- AWARE-2.6** Identify typical container shapes that may indicate hazardous materials.
- AWARE-2.7** Identify facility and transportation markings and colors that indicate hazardous materials, including:
1. UN/NA identification number
 2. NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, markings
 3. Military hazardous materials markings
 4. Special hazard communication markings
 5. Pipeline marker
 6. Container markings

- AWARE-2.8** Given an NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response marking, identify the significance of the colors, numbers and special symbols.
- AWARE-2.9** Identify US. and Canadian placards and labels that indicate hazardous materials.
- AWARE-2.10** Identify the basic information on material safety data sheets (MSDS) and shipping papers that indicate hazardous materials.
- AWARE-2.10.1** Identify where to find material safety data sheets (MSDS).
- AWARE-2.10.2** Identify entries on a material safety data sheet that indicate the presence of hazardous materials.
- AWARE-2.10.3** Identify the entries on shipping papers that indicate the presence of hazardous materials.
- AWARE-2.10.4** Match the name of the shipping papers found in transportation (air, highway, rail and water).
- AWARE-2.10.5** Identify the person responsible for having the shipping papers in each mode of transportation.
- AWARE-2.10.6** Identify where the shipping papers are found in each mode of transportation.
- AWARE-2.10.7** Identify where the papers can be found in an emergency in each mode of transportation.
- AWARE-2.11** Identify examples of clues (other than occupancy/location, container shape, markings/color, placards/labels, and shipping papers) that use the senses of sight, sound, and odor to indicate the presence of hazardous materials.
1. Changes in pressure release
 2. Presence of smoke and/or fire
 3. Presence of liquids, gas leaks, or vapor cloud
 4. Chemical reactions
 5. Condensation lines
 6. Mass Casualties
- AWARE-2.12** Describe the limitations of using the senses in determining the presence or absence of hazardous materials.
- AWARE-2.13** Identify types of locations that may become targets for criminal or terrorist activity using hazardous materials.
The following are some examples of locations:
1. Public assembly areas
 2. Public/Government buildings
 3. Mass transit systems
 4. Places with high economic impact
 5. Telecommunications facilities
 6. Places with historical or symbolic significance
 7. Military facilities
 8. Airports, Train Stations and Ports
 9. Industrial facilities
- AWARE-2.14** Identify at least four indicators of possible criminal or terrorist activity involving hazardous materials. The following are some examples of indicators:

1. Hazardous materials or lab equipment that is not relevant to the occupancy
2. Intentional release or hazardous materials
3. Unexplained patterns of sudden onset illnesses or deaths
4. Unusual orders or tastes
5. Mass casualty incident with unexplained signs of skin, eye or airway irritation
6. Unusual security, locks, bars on windows, covered windows and barbed wire
7. Unexplained vapors clouds, mists and plumes
8. Patients twitching, tightness in chest, sweating, pinpoint pupils (miosos), runny nose (rhinorrhea) and nausea and vomiting.
9. Unusual presence of natural indicators such as sick or dead birds and animals or dead or discolored trees, shrubs or grass.

- AWARE-2.15** Describe the difference between a chemical and a biological incident.
1. Chemical incident are identified by the rapid onset of medical signs and systems characteristic of chemical exposure. Natural indicators and obvious signs of release may be present such as chemical residue and odors.
 2. Biological incident are gradual in onset of medical signs and systems with no obvious characteristic of odor or colors. The migration of the disease by infected individuals may be wide spread and transmission from one person to another may occur.

- AWARE-2.16** Identify at least four indicators of possible criminal or terrorist activity involving biological agents. The following are some examples of indicators:
1. Mass causality incident with unusual number of ill or dying persons with common signs and symptoms.
 2. Hospitals reporting mass causalities with similar signs and symptoms.
 3. Unscheduled outdoors spraying
 4. Abandoned spraying (dissemination) device.

Analyzing the Incident – Surveying the Hazardous Materials Incident from a Safe Location

- AWARE-3** Given simulated facility and transportation incidents involving hazardous materials, identify the hazardous material(s) in each situation by name, UN/NA identification number and/or type placard applied.
- AWARE-3.1** Describe difficulties encountered in determining the specific names of hazardous materials in both facilities and transportation.
- AWARE-3.2** Identify the significance of the terms “Type A”, “Type B” and “Special Form” as they relate to radioactive materials packaging.
- AWARE-3.3** Identify additional information concerning radionuclide identity and activity provided on radioactive material labels and shipping papers.
- AWARE-3.4** Identify additional information concerning physical and chemical form and packaging type provided on radioactive materials shipping papers.
- AWARE-3.5** Identify sources for obtaining the names of, UN/NA identification numbers for or type of placards associated with hazardous materials in transportation.
- AWARE-3.6** Identify sources for obtaining the names of hazardous materials in a facility.

Analyzing the Incident – Collecting Hazard Information

- AWARE-4** Given the identity of various hazardous materials (name, UN/NA number, or type placard), identify the fire, explosion and health hazard information for each material using the current edition of the *North American Emergency Response Guidebook*.
- AWARE-4.1** Identify the way hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- AWARE-4.2** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-4.3** Given the current edition of the *North American Emergency Response Guidebook*, identify the three methods for determining the appropriate guide page for a specific hazardous material.
- AWARE-4.4** Given the current edition of the *North American Emergency Response Guidebook*, identify the two general types of hazards found on each guide page.
- AWARE-4.5** Identify the difficulties encountered in using the senses to recognize radioactive material releases and radiation exposure.

Analyzing the Incident – Initiating Protective Actions

- AWARE-5** Given simulated facility and transportation hazardous materials incidents, identify the actions to be taken to protect themselves and others and to control access to the scene using the local emergency response plan, the organization's SOP's, or the current edition of the *North American Emergency Response Guidebook*.
- AWARE-5.1** Identify the location of both the local emergency response plan and the organization's SOP's.
- AWARE-5.2** Given the local emergency response plan or the organization's SOP's, identify the role of the first responder at the awareness level during a hazardous material incident.
- AWARE-5.2.1** Given a simulated facility and/or transportation hazardous materials incidents, initiate the incident management system (IMS) specified in the local emergency response plan and the organizations SOP's.
- AWARE-5.2.2** Identify the basic techniques for the following protective actions at hazardous materials incidents.
1. Evacuation
 2. In-place protection
- AWARE-5.3** Given the local emergency response plan or the organization's SOP's, identify the basic precautions to be taken to protect themselves and others in a hazardous materials incident.
- AWARE-5.3.1** Identify circumstances involving radioactive material in transportation where actions should be initiated to protect the lives of accident victims through carrying out rescue and providing emergency medical care.
- AWARE-5.3.2** Identify the precautions necessary when providing emergency medical care to victims of hazardous materials incidents.
- AWARE-5.3.3** Identify typical ignition sources found at scenes of hazardous materials incidents.

- AWARE-5.3.4** Identify the ways hazardous materials are harmful to people, the environment, and property at hazardous materials incidents.
- AWARE-5.3.5** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-5.4** Given the identity of various hazardous materials (name, UN/NA identification number, or type placard), identify the following response information using the current edition of the *North American Emergency Response Guidebook*:
1. Emergency Action (fire, spill, leak and first aid)
 2. Personal protective equipment necessary
 3. Initial isolation and protective action distances
- AWARE-5.4.1** Given the name of a hazardous material, identify the recommended personal protective equipment from the following list:
1. Street clothing and work uniforms
 2. Structural fire-fighting protective clothing
 3. Positive pressure self-contained breathing apparatus (SCBA)
 4. Chemical-protective clothing and equipment
- AWARE-5.4.2** Identify the definitions for each of the following protective actions:
1. Isolation of the hazard area and denial of entry
 2. Evacuation
 3. Sheltering in-place protection
- AWARE-5.4.3** Identify the shapes of recommended initial isolation and protective action zones.
- AWARE-5.4.4** Describe the difference between small and large spills as found in the table of Initial Isolation and Protective Actions Distances.
- AWARE-5.4.5** Identifying the circumstances under which the following distances are used at a hazardous materials incident:
1. Table of initial isolation and protective action distances
 2. Isolation distances in the numbered guides
- AWARE-5.4.6** Given a copy of the current edition of the *North American Emergency Response Guidebook*, describe the difference between the isolation distances in the orange-bordered guide pages and the protective action distances in the green-bordered pages in the document.
- AWARE-5.5** Identify the techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials incidents.
- AWARE-5.6** Identify the specific actions necessary when an incident is suspected to involve criminal or terrorist activity. The following are some examples:
1. Take self protective actions
 2. Be alert to secondary devices
 3. Communicate the suspicion during the notification process
 4. Establish work control zones and access control points
 5. Isolate potentially exposed people
 6. Document the initial observation
 7. Prevent secondary contamination
 8. Attempt to preserve evidence while performing operational duties

Implementing the Response – Initiating the Notification Process

AWARE-6 Given either a facility or transportation scenario of hazardous materials incidents, with and without criminal or terrorist activities, identify the appropriate notifications to be made and how to make them, consistent with the local emergency response plan or the organization's SOP's.

AWARE-6.1 Identify the initial notification procedures for hazardous materials incidents in the local emergency response plan or the organization's SOP's.

The following training objectives are recommended for first responder EMS Level 1. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

In addition to the hazardous materials first responder awareness level training, all EMS Level 1 responders will be trained in the following competencies:

EMS Responder Level 1

Recommended Training Objectives

EMS(1)-1 Given a hazardous materials incident scenario, demonstrate an understanding of the role of the EMS Responder Level 1 to safely deliver emergency medical care in the cold zone.

EMS(1)-1.1 Describe the responsibility of the emergency EMS Responder Level 1 to analyze a hazardous materials emergency to determine what risks are present to the provider and the patient.

1. Determine the hazards present
2. Risk of secondary contamination

EMS(1)-1.2 Describe the responsibility of the EMS Responder Level 1 to plan a response to provide the appropriate level of emergency medical care to persons involved in hazardous materials incidents.

1. Describe the role of the EMS Level 1 responder
2. Plan the appropriate response for patient care
3. Determine the appropriate personal protective equipment (PPE)
4. Determine the appropriate equipment and supplies for patient care

EMS(1)-1.3 Describe the responsibility of the EMS Responder Level 1 to implement the planned response.

1. Perform the necessary preparation to receiving the patient and preventing secondary contamination at the hazardous materials incident
2. Provide appropriate patient treatment
3. Provide appropriate patient transport
4. Perform medical support to response personnel at the hazardous materials incident

EMS(1)-1.4 Describe the responsibility of the EMS Responder Level 1 to terminate the incident.

Analyzing the Hazardous Materials Incident

EMS(1)-2 Given an emergency involving hazardous materials, determine the hazards to the responder and the patient in that situation.

- EMS(1)-2.1** Given an emergency involving hazardous materials, assess the nature, severity, and potential for expansion of the incident as it pertains to EMS responsibilities at a hazardous materials incident with evaluation of available resources and a request for any needed assistance.
- EMS(1)-2.2** Given an emergency involving hazardous materials, evaluate the environmental factor as they affect the patient care.
- EMS(1)-2.3** Identify the information resources available and how to access the following:
1. Poison Control Center
 2. Medical Control
 3. Material Safety Data Sheet (MSDS)
 4. Reference guidebooks
 5. Hazardous materials databases
 6. Technical information centers (CHEMTREC, NRC, etc.).
 7. Technical specialist
 8. Agency for Toxic Substances and Disease Registry (ATSDR)
 9. Other applicable reference materials.
- EMS(1)-2.4** Given a pesticide label, hazardous materials placard, and MSDS research, identify, and explain the significance of the following.
1. Name of pesticide
 2. Signal word
 3. EPA registration number
 4. Precautionary statement
 5. Hazard statement
 6. Active ingredient
- EMS(1)-3** Given a hazardous materials incident, assess the patient to determine the risk of secondary contamination.
- EMS(1)-3.1** Explain the basic toxicological principles relative to the assessment and treatment of victims exposed to hazardous materials, including the following:
1. Acute and delayed toxicity
 2. Reroutes of exposure
 3. Local and systemic effects
 4. Dose response as it relates to risk assessment
 5. Synergistic effects
 6. Health hazards as determined by assessing toxicity, exposure and dose.
- EMS(1)-3.2** Describe how the chemical contamination of patients alters the principles of triage in hazardous materials incidents.
- EMS(1)-3.3** Explain the need for patient decontamination procedures at hazardous materials incidents.
- EMS(1)-3.4** Describe how the potential for secondary contamination determines the extent of patient decontamination required.
- EMS(1)-3.5** Describe the way personal protective clothing, breathing apparatus, tools and equipment become contaminated and the importance and limitations of decontamination procedures.

- EMS(1)-3.6** Explain the decontamination procedures as defined by the authority having jurisdiction (AHJ) for patients, personnel, personal protective equipment and apparatus at hazardous materials incidents.
- EMS(1)-3.7** Describe how priorities for care of chemically contaminated patients differ from those suffering from radiological contamination.
- EMS(1)-4** Advise the evaluator of the names of hospital facilities in the local area capable of handling patients contaminated at a hazardous materials incident and the importance of this information.
- EMS-(1)-5** Given a description of a community, the EMS Level 1 responder should identify types of locations that may become targets for criminal or terrorist activity using hazardous materials.
The following are some examples of locations:
1. Public assembly areas
 2. Public/Government buildings
 3. Mass transit systems
 4. Places with high economic impact
 5. Telecommunications facilities
 6. Places with historical or symbolic significance
 7. Military facilities
 8. Airports, Train Stations and Ports
 9. Industrial facilities
- EMS-(1)-6** Describe the difference between a chemical and a biological incident.
1. Chemical incidents are identified by the rapid onset of medical signs and symptoms characteristic of chemical exposure. Natural indicators and obvious signs of release may be present such as chemical residue and odors.
 2. Biological incidents are gradual in onset of medical signs and symptoms with no obvious characteristic of odor or colors. The migration of the disease by infected individuals may be widespread and transmission from one person to another may occur.
- EMS-(1)-7** Identify at least four indicators of possible criminal or terrorist activity involving chemical agents. The following are some examples of indicators:
1. Hazardous materials or lab equipment that is not relevant to the occupancy
 2. Intentional release or hazardous materials
 3. Unexplained patterns of sudden onset of similar, non-traumatic illnesses or deaths. Pattern may be geographic, by employer or associated with agent dissemination methods.
 4. Unusual orders or tastes that are not in character with the surroundings
 5. Mass casualty incident with unexplained signs of skin, eye or airway irritation
 6. Unusual security, locks, bars on windows, covered windows and barbed wire
 7. Unexplained vapors clouds, mists and plumes
 8. Patients twitching, tightness in chest, sweating, pinpoint pupils (miosos), runny nose (rhinorrhea) and nausea and vomiting.
 9. Unusual presence of natural indicators such as sick or dead birds and animals or dead or discolored trees, shrubs or grass.
- EMS-(1)-8** Identify at least four indicators of possible criminal or terrorist activity involving biological agents. The following are some examples of indicators:
1. Mass causality incident with unusual number of ill or dying persons with common signs and symptoms.
 2. Hospitals reporting mass causalities with similar signs and symptoms.

3. Unscheduled outdoors spraying
4. Abandoned spraying (dissemination) device

Planning the Response

- EMS(1)-9** Given a plan of action by the incident commander, describe the EMS Level 1 responder's role in a hazardous materials incident as identified in the Local Emergency Response Plan or the organization's SOP's, and determine if the personal protective equipment provided is appropriate and if the equipment and supplies are adequate for implementing the planned response.
- EMS(1)-9.1** Given specific scenarios, describe the emergency medical component of the hazardous materials response plan as developed by the authority having jurisdiction.
- EMS(1)-9.2** State the EMS Level 1 responder's role within the hazardous materials response plan as developed by the authority having jurisdiction.
- EMS(1)-9.3** State the EMS Level 1 responder's role within the Incident Management System (IMS).
- EMS(1)-10** Given a hazardous materials incident, be able to plan a response to provide the appropriate level of emergency medical care, including the SOP's for the medical management of persons exposed to hazardous materials, as specified by the authority having jurisdiction.
- EMS(1)-11** Given the name of the hazardous material and the type, duration, and extent of exposure and decontamination process, determine if available personal protective clothing and equipment are appropriate to implement the planned response.
- EMS(1)-11.1** Describe the application, use, and limitations of the following:
1. Street clothing and work uniforms
 2. Structural fire fighter protective clothing
 3. Chemical protective clothing
 4. Respiratory protective equipment
 5. Body substance isolation equipment
- EMS(1)-11.2** Given a simulated hazardous materials incident, determine if available equipment and supplies are appropriate to implement the planned response and describe the equipment and supplies available to the EMS Level 1 responder for the care and transportation of the hazardous materials incident patient.

Implementing the Planned Response

- EMS(1)-12** Given a plan for providing patient care at a hazardous materials incident, perform the preparations necessary to receive the patient for treatment and transport.
- EMS(1)-12.1** Given a plan for providing patient care, the EMS Level 1 responder shall be able to list the information that should be communicated to the medical control/receiving facility regarding the hazardous materials incident, including:
1. Type and nature of the incident
 2. Chemical involved and its physical state
 3. Number of potential patients
 4. Manifestation in patient condition
 5. Extent of decontamination the patient has received.
- EMS(1)-12.2** Describe the procedure for preparing the vehicle and equipment for the patient.

- EMS(1)-12.3** Demonstrate the proper donning, doffing, use and limitations of all personal protective equipment provided to the EMS Level 1 responder by the authority having jurisdiction for use in their hazardous materials response activities.
- EMS(1)-12.4** Describe the concept of patient transfer from the incident site to the decontamination area and then to the treatment area.
- EMS(1)-13** Given a plan for providing patient care at a hazardous materials incident, provide patient care consistent with the planned response and the organization's SOP's.
- EMS(1)-13.1** Describe how chemical contamination alters the assessment and care of the hazardous materials patient.
- EMS(1)-13.2** List the common signs and symptoms and describe the EMS treatment protocols for the following:
1. Corrosives (acid, alkali)
 2. Choking agents or pulmonary irritants (ammonia, chlorine, phosgene)
 3. Pesticides (organophosphates)
 4. Chemical asphyxiants (cyanide, carbon monoxide)
 5. Hydrocarbon solvents (xylene, methylene chloride)
 6. Nerve agents (sarin, tabun)
 7. Vesicants (blister agents)
 8. Biological agents and toxins (anthrax, smallpox, ricin)
 9. Irritants (riot control agents CN, CS)
 10. Blood agents (hydrogen cyanide, cyanogens)
 11. Radiological materials
 12. Incapacitating agents.
- EMS(1)-13.3** Explain the potential risk with invasive procedures for hazardous materials patients.
- EMS(1)-13.4** Demonstrate the ability to perform the following EMS functions within the Incident Management System (IMS) during incidents involving multiple hazardous materials patients:
1. EMS control
 2. Triage
 3. Treatment
 4. Disposition and transportation.
- EMS(1)-14** Given a patient from a hazardous materials incident, transport the patient as specified in the local emergency response plan and the organization's SOP's.
- EMS(1)-14.1** Identify the capabilities of the medical facilities available in the local area to receive hazardous materials patients.
- EMS(1)-14.2** Identify acceptable vehicles available to transport hazardous materials patients from the treatment area to a receiving facility.
- EMS(1)-14.3** List the pertinent patient information that should be communicated to the receiving facility, including the following:
1. Estimated time of arrival,
 2. Age/sex of patient
 3. Patient condition/chief complaint
 4. Associated injuries
 5. Routes, extent and duration of chemical exposure

6. Pertinent medical history
 7. Signs and symptoms
 8. Vital signs
 9. Treatment, including decontamination and patient response
 10. Pertinent chemical characteristics.
- EMS(1)-14.4** Describe the actions necessary for the coordinated delivery of hazardous materials affected patients to a receiving facility.
- EMS(1)-14.5** Explain the special hazards associated with the air transportation of patients exposed to hazardous materials.
- EMS(1)-15** Describe the patient decontamination process.
- EMS(1)-16** Given a simulated hazardous materials incident, perform medical support of response personnel.
- EMS(1)-16.1** Identify the components of pre-entry and post-entry assessment to include the following:
1. Vital signs
 2. Body weight
 3. General health
 4. Medications
 5. Neurological status
 6. EKG.
- EMS(1)-16.2** Identify the following factors and how they influence heat stress for response personnel:
1. Hydration
 2. Physical fitness
 3. Environmental factors
 4. Activity levels
 5. Level of PPE
 6. Duration of entry.
- EMS(1)-16.3** Identify the medical monitoring protocols and demonstrate medical monitoring procedures for hazardous materials personnel at the scene.
- EMS(1)-16.4** Define the criteria for site selection of a medical monitoring station at the scene of a hazardous materials incident.
- EMS(1)-16.5** Demonstrate the ability to set up and operate a medical monitoring station at the scene of a hazardous materials incident.
- EMS(1)-16.6** Demonstrate the ability to interpret and analyze data obtained from a medical monitoring station at the scene of a hazardous materials incident.
- EMS(1)-16.7** Demonstrate proper documentation of medical monitoring at the scene of a hazardous materials incident.
- EMS(1)-17** Identify the specific actions necessary when an incident is suspected to involve criminal or terrorist activity. The following are some examples of actions:
1. Take protective actions to protect yourself and other responders
 2. Communicate the suspicion during the notification process
 3. Isolate potentially exposed people or animals
 4. Document initial observations
 5. Attempt to preserve evidence while performing operational duties

6. Be alert for secondary devices
7. Establish access control points and work control zones
8. Prevent secondary contamination.

EMS(1)-17.1 Identify the procedures, equipment and safety precautions for collecting legal evidence at hazardous materials incidents.

EMS(1)-18 Given either a facility or transportation scenario of hazardous materials, with or without criminal or terrorist activities, the EMS Level 1 responder shall identify the appropriate initial notifications to be made and how to make them, consistent with the local emergency response plan or the organization's SOP's.

EMS(1)-19 Given an incident involving the suspicion of a biological agent the EMS Level 1 responder should identify the following:

1. Identify the correct body substance isolation procedures to be followed
2. Identify the proper decontamination procedures in accordance with their Standard Operating Procedures
3. Identify the necessary post-exposure reporting to facilitate post-exposure prophylaxis when available.

Terminating the Incident

EMS(1)-20 Upon termination of the hazardous materials incident, complete the reporting, documentation, and EMS termination activities as required by the local emergency response plan or the organization's SOPs.

EMS(1)-20.1 Given scenarios, list the information to be gathered regarding the exposure of the patient and the EMS provider and describe the proper reporting procedures to include the following:

1. Patient number, condition and disposition
2. Product information
3. Exposure routes, extent and duration
4. Actions taken to limit exposure and contamination
5. Treatment rendered and adverse reactions noted.

EMS(1)-20.2 Given scenarios, identify situations that may necessitate critical incident stress debriefing intervention.

EMS(1)-20.3 Describe the EMS provider's role in the post-incident critique.

Summary: EMS Responder Level 1

Audience

Large training audience. All Paramedics and Emergency Medical Technicians who respond to emergencies, including all transportation accidents that may involve hazardous materials.

Prerequisites

First Responder Awareness Level

Training

- Classroom, physical skills lab and simulator/field instruction, with emphasis on decision making and treatment skills.
- Competencies:
 - ◆ Assessing incident scene hazards and risk of secondary contamination.
 - ◆ Incident scene planning, including determining personal protective equipment needs and defining roles and responsibilities of the EMS Level 1 responder.
 - ◆ Ability to perform EMS Level 1 patient preparation, care, and preparation for transport.
 - ◆ Ability to perform post-incident EMS reporting, documentation, and follow-up.

Refresher Training

1. Technical Updates
2. Changes in response protocols, SOPs, and incident command procedures.
3. Renewal and retesting of incident scene decision making and cold zone treatment skills.

Emergency Medical Service Responder Level 2

Introduction

Emergency Medical Service (EMS) Responders Level 2 shall be trained to the first responder operations level as defined in OSHA 29 CFR 1910.120 (q)(ii) and to the competencies of EMS Level 1, as defined in these guidelines. In addition, EMS Responder Level 2 shall meet all the training requirements of the Florida Department of Health Bureau of Emergency Medical Services Emergency Medical Technician (EMT) and/or Paramedic certification, U.S. Occupational Health and Safety Administration, Florida Department of Environmental Protection and the U.S. Environmental Protection Agency (EPA), as appropriate for their jurisdiction.

Decontamination of patients or rescue personnel is a critical task. These individuals have come in contact with a foreign agent that will manifest itself either in long-term (chronic) or short-term (acute) medical conditions. Whether the ramifications of contact with the foreign agent are chronic or acute, the need to have medically trained personnel, EMTs and Paramedics conducting these procedures is imperative and self-explanatory. The utilization of certified EMTs and Paramedics trained in hazardous materials to conduct the decontamination operation would result in a higher level of patient care. Properly trained EMTs & Paramedics will have the ability to provide effective and efficient patient assessment and pre-hospital care benefiting all who are involved in these types of operations.

EMS Level 2 responders are expected to be able to analyze hazardous materials incidents to determine the magnitude of problem areas in terms of outcomes based on their own assessment. They also are expected to plan a response and provide the appropriate level of emergency medical care and decontamination to persons involved in hazardous materials incidents, to provide medical support to hazardous materials response personnel, and to implement and terminate the response.

In addition to being trained to the first responder operational level, emergency service personnel responding to hazardous material incidents will be trained and receive regular continuing education to maintain competence in three areas: emergency medical technology, hazardous materials and specialized topics such as hazardous materials toxicology, as approved by the Florida Department of Health Bureau of Emergency Medical Services. The training program should be a comprehensive competency-based presentation of the required subject material with applicable hands-on sessions that demonstrate the newly acquired skills.

Definition

Emergency Medical Services Responders Level 2 are those persons who, in the normal course of their activities may be called upon to perform patient care and decontamination activities in the warm zone (contamination reduction zone) at hazardous materials incidents. EMS Level 2 responders are called on to provide care to those individuals that still pose a significant risk of secondary contamination (that is, a risk of contaminating others, including those providing care). In addition, personnel at this level shall be able to coordinate EMS activities at a hazardous materials incident and to provide medical support and decontamination of hazardous materials response personnel.

Audience

EMS Responders Level 2 may be individuals charged with the responsibility of providing and coordinating EMS services at a hazardous materials scene. This includes selected Emergency Medical Technicians and Paramedics, and may include members of industrial fire brigades who are assigned to patient care responsibility at a hazardous materials incident onsite or offsite.

Related Health, Safety, and Performance Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)
EPA 40 CFR 311 Worker Protection
NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents.
2002 Edition
NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials
Incidents. 2002 Edition
NFPA 473 Standard for Competencies for EMS Personnel Responding to Hazardous Materials
Incidents. 2002 Edition
NETC Guidelines for Public Sector Hazardous Materials Training, March 1998
USFA, Emergency Incident Rehabilitation Guide, FA-114

Florida Department of Health, Bureau of Emergency Medical Services Emergency Medical Technician and Paramedic curricula constitutes the entry-level EMS preparation for continuing hazardous materials training. At a hazardous materials incident, it is desirable that all EMS basic life-support-provider personnel are trained to the entry level EMT or equivalent, as well as, the hazardous materials competencies included in this document.

Appropriate Methodologies

EMS Responder Level 2 training should include a combination of traditional classroom lecture and small group activities, tabletop and field exercises involving working with the incident command structure in simulated emergencies, and hands on psychomotor skills training. Content instruction should focus on contamination hazards, decontamination procedures, health monitoring treatment procedures and incident scene roles and responsibilities.

Student activities should focus on assessment and analysis of hazards and determination of appropriate procedures. Skill training should focus on implementing decontamination and patient care procedures and use of appropriate personal protective equipment. Written and practical examinations are highly recommended to measure achievement in initial training and refresher programs, and to support the employer's responsibility that all EMS Level 2 personnel are trained to competency before being called on to perform Level 2 functions at an actual emergency. Tabletop and field exercises should focus on acting out incident scene roles and on implementing procedures in the field environment. Refresher training should focus on technical updates, updates on changes in response protocols and SOPs, and renewal of individual skill in decontamination, patient treatment, and use of personal protective equipment.

The SERC estimates that the initial entry-level training can be accomplished in approximately 24 contact hours, anticipating completion of first responder awareness training and EMS Level 1, with competent instructors knowledgeable in hazardous materials response. Annual refresher training should be accomplishable with approximately 4 contact hours. However, 8 hours would be preferred.

The Florida Department of Health, Bureau of Emergency Medical Services requires the individual to recertify every two years. It is recommended that the individual be required to demonstrate proof of refresher training consistent with existing standards and that all EMS employers and educational institutions be required to issue certificates of training for compliance with hazardous materials refresher training.

The following resources are recommended to supplement the training process:

Local LEPC Emergency Response Plan
Local Standard Operating Procedures
Hawley's Condensed Chemical Dictionary. R. J. Lewis, Sr. 13th Edition. 1997

Hazardous Chemical Data (U.S. Government)
OSHA 29 CFR 1910.120 (Current Edition)
NIOSH Pocket Guide (Current Edition)
Association of American Railroads Emergency Action Guides (Current Edition)
NFPA 471, 472, 473 (Current Edition)
Handbook of Toxic and Hazardous Chemicals and Carcinogens. Marshall Sittig. 3rd Edition.
Haz/Mat Injuries (Bradford/Stutz)
Emergency Care for Haz/Mat Exposures. Mosby/Bronstien and Currance.

Training

All EMS Responder Level 2 personnel will be trained to the operational level utilizing the Florida First Responder Operational Level Hazardous Materials Training Program; National Fire Academy Program - Initial Response to Hazardous Materials Incidents: Basic Concepts and Concept Implementation or similar curricula complying with the First Responder Operational Level as defined in 29 CFR 1910.120 and NFPA 472. Additionally, all EMS Level 2 responders will be trained to perform the EMS Level 1 and 2 competencies.

The following training objectives are recommended for first responder operational level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

First Responder Operational

The First Responder Operational competencies included here for reference.

Recommended Training Objectives

- OPS-1** Given a hazardous materials incident scenario, demonstrate an understanding of the responders at the operations level.
- OPS-1.1** Describe the responsibility to analyze the hazardous materials incident and determine the magnitude of the problem in terms of outcomes, and demonstrate the ability to do the following:
 - OPS-1.1.1** Identify the responsibility to survey the hazardous materials incident to determine the containers and materials involved, whether hazardous materials have been released, and the surrounding conditions.
 - OPS-1.1.2** Identify the responsibility to collect hazard and response information from MSDS, CHEMTREC and shipper / manufacturer contacts.
 - OPS-1.1.3** Identify the responsibility to predict likely behavior of a material and its container.
 - OPS-1.1.4** Identify the responsibility to estimate the potential harm at a hazardous materials incident.
- OPS-1.2** Describe the responsibility to plan an initial response within the capabilities and competencies of available personnel, personal protective equipment and control equipment, and demonstrate the ability to do the following:
 - OPS-1.2.1** Identify the responsibility to describe the response objectives available for hazardous materials incidents.
 - OPS-1.2.2** Identify the responsibility to describe the defensive options available for a given response objective.

- OPS-1.2.3** Identify the responsibility to determine whether the personal protective equipment provided is appropriate for implementing each defensive option.
- OPS-1.2.4** Identify the responsibility to identify the emergency decontamination procedures.
- OPS-1.3** Describe the responsibility to implement the planned response to favorably change the outcomes consistent with the local emergency response plan and the organization's SOP's, and demonstrate the ability to do the following:
- OPS-1.3.1** Identify the responsibility to establish and enforce scene control procedures including control zones, emergency decontamination and communications.
- OPS-1.3.2** Identify the responsibility to initiate the incident management system (IMS) for hazardous materials incidents.
- OPS-1.3.3** Identify the responsibility to don, work in and doff personal protective equipment provided by the authority having jurisdiction.
- OPS-1.3.4** Identify the responsibility to perform defensive control functions identified in the action plan.
- OPS-1.4** Describe the responsibility to evaluate the progress of the actions taken to ensure that the response objectives are being met safely, effectively, and efficiently, and demonstrate the ability to do the following:
- OPS-1.4.1** Identify the responsibility to evaluate the status of the defensive actions taken in accomplishing the response objectives.
- OPS-1.4.2** Identify the responsibility to communicate the status of the planned response.

Analyzing the Incident: Surveying the Hazardous Materials Incident

- OPS-2** Given examples of both facility and transportation situations involving hazardous materials, survey the hazardous materials incident to determine the container materials involved, whether hazardous materials have been released, and the surrounding conditions. The survey should include the following:
- and
1. Inventory of the type of containers involved
 2. Container identification markings
 3. Container quantity or capacity
 4. Involved materials
 5. Release information
 6. Surrounding conditions.
- OPS-2.1** Given examples of various hazardous materials containers, identify the general shapes of containers for liquids, gases, and solid hazardous materials that are typically found.
- OPS-2.1.1** Given examples of the following tank cars, identify each tank car by type:
1. Nonpressure tank cars with and without expansion domes
 2. Pressure tank cars
 3. Cryogenic liquid tank cars
 4. Pneumatically unloaded hopper cars
 5. High-pressure tube cars.

- OPS-2.1.2** Given examples of the following intermodal tank containers, identify each intermodal tank container by type; identify one material and its USDOT Hazard Class that is typically found in each tank:
1. Nonpressure intermodal tank containers (IM-101 and IM 102)
 2. Pressure intermodal tank containers
 3. Special intermodal tanks (Cryogenic and tube modules)
- OPS-2.1.3** Given examples of the following cargo tank by type:
1. Nonpressure liquid tanks (MC-306)
 2. Low pressure chemical tanks (MC307)
 3. Corrosive liquid tanks (MC-312)
 4. High pressure tanks (MC-331)
 5. Cryogenic liquid tanks (MC-338)
 6. Dry bulk cargo tanks
 7. Compressed gas tube trailers.
- OPS-2.1.4** Given examples of the following facility tanks, identify at least one material and its hazard, that are typically found in each fixed facility tank by type:
1. Nonpressure tank
 2. Pressure tank
 3. Cryogenic liquid tank.
- OPS-2.1.5** Given examples of the following non-bulk packages, identify each package by type:
1. Bags
 2. Carboys
 3. Cylinders
 4. Drums.
- OPS-2.1.7** Given examples of various radioactive material containers, identify each container/package by type:
1. Type A Package
 2. Type B Package
 3. Industrial
 4. Excepted
 5. Strong, tight containers.
- OPS-2.2** Given examples of facility and transportation containers, identify the markings that differentiate one container from another.
- OPS-2.2.1** Given examples of the following marked transport vehicles and their corresponding shipping papers, identify the vehicle or tank identification marking:
1. Rail transportation vehicles, including tank cars
 2. Intermodal equipment including tank containers
 3. Highway transport vehicles, including cargo tanks
- OPS-2.2.2** Given examples of the facility containers, identify the markings indicating container size, product contained and /or site identification numbers.
- OPS-2.3** Given examples of the facility and transportation scenario involving hazardous materials, identify the name(s) of the hazardous material(s) in each situation.
- OPS-2.3.1** Identify the following information on a pipeline marker:
1. Product
 2. Owner/operator
 3. Emergency telephone number.

OPS-2.3.2 Given a pesticide label, identify each of the following pieces of information; then match the piece of information to its significance in surveying the hazardous material incident:

1. Name of pesticide
2. Signal word
3. Pest control product number
4. Precautionary statement
5. Hazard statement
6. Active ingredient.

OPS-2.3.3 Given a radioactive material label identify vertical bars, contents and activity and transport index.

OPS-2.4 Identify and list surrounding conditions that should be noted when surveying hazardous materials incidents. Surrounding conditions may include:

1. The topography, land use, bodies of water and accessibility
2. Weather conditions
3. Public exposure potential, adjacent land use (rail lines, roadways, ports and airports)
4. Utilities, pipelines, storm and sewer drains
5. Ignitions sources
6. Nature and extent of injuries
7. Building information such as floor drains, ventilation ducts and returns should be considered.

OPS-2.5 Give examples of ways to verify information obtained from the surveying of a hazardous materials incident.

OPS-2.6 Identify at least three additional hazards that could be associated with an incident involving criminal or terrorist activity. The following are some examples of hazards:

1. Secondary events intended to delay or incapacitate emergency responders
2. Armed resistance
3. Use of weapons
4. Booby traps
5. Secondary contamination from handling patients
6. Hostage barricade situations.

Analyzing the Incident: Collecting Hazard and Response Information

OPS-3 Given known hazardous materials, collect hazard and response information from MSDS, CHEMTREC and contacts with the shipper/manufacturer.

OPS-3.1 Match the definitions associated with the USDOT Hazard Classes and divisions of hazardous materials, including refrigerated gases and cryogenic liquids, with the class or division.

OPS-3.2 Identify two ways to obtain a MSDS in an emergency.

OPS-3.3 Using a MSDS for a specified material, identify the following hazard and response information:

- a. Physical and chemical characteristics
- b. Physical hazards of the material
- c. Health hazards of the material
- d. Signs and symptoms of exposure
- e. Routes of entry
- f. Permissible exposure limits
- g. Responsible party contact

- h. Precautions for safe handling (including hygiene practices, protective measures, procedures for clean up of spills and leaks)
- i. Applicable control measures including personal protective equipment
- j. Emergency and first aid procedures.

- OPS-3.4** Identify the following:
- 1. The type of assistance provided by CHEMTREC.
 - 2. How to contact CHEMTREC.
 - 3. The information to be furnished to CHEMTREC.
- OPS-3.5** Identify two methods of contacting the manufacturer or shipper to obtain hazard and response information.
- OPS-3.6** Identify two types of assistance provided by local, state and federal authorities, with respect to criminal or terrorist activities involving hazardous materials.
- OPS-3.6.1** Identify the procedure for contacting local, state and federal authorities as specified in the local emergency response plan (ERP) or the organization's SOP's.
- OPS-3.7** Describe the properties and characteristics of the following:
- 1. Alpha particles
 - 2. Beta particles
 - 3. Gamma rays
 - 4. Neutrons.

Analyzing the Incident: Predicting the Behavior of a Material and its Container

- OPS-4** Given examples of a single facility and transportation hazardous materials incidents, predict the likely behavior of a material and its container in each incident.
- OPS-4.1** Given situations involving known hazardous materials, interpret the hazard response information obtained from the current edition of the North American Emergency Response Guidebook, MSDS, CHEMTREC, and shipper/manufacturer contacts.
- OPS-4.1.1** Match the following chemical and physical properties with their significance and impact on the behavior of the container and/or its contents:
- 1. Boiling point
 - 2. Chemical reactivity
 - 3. Corrosivity (pH)
 - 4. Flammable (explosive) range (LEL & UEL)
 - 5. Flash point
 - 6. Ignition (autoignition) temperature
 - 7. Physical state (solid, liquid, gas)
 - 8. Specific gravity
 - 9. Toxic products of combustion
 - 10. Vapor density
 - 11. Vapor pressure
 - 12. Water solubility
 - 13. Radiation (ionizing and non-ionizing)
- OPS-4.1.2** Identify the differences among the following terms:
- 1. Exposure and hazard

2. Exposure and contamination
3. Contamination and secondary contamination
4. Radioactive material exposure

OPS-4.2 Identify three types of stress that could cause a container system to release its contents:

1. Mechanical stress
2. Thermal stress
3. Chemical stress.

OPS-4.3 Identify five ways in which containers can breach:

1. Punctures
2. Splits or tears
3. Closures opening up
4. Disintegration
5. Runaway cracking.

OPS-4.4 Identify four ways in which containers can release their contents.

1. Catastrophic release or rupture
2. Detonation
3. Rapid relief
4. Spills or leaks.

OPS-4.5 Identify the general testing requirements for "Type A," "Type B" and "Special Form" packaging used for radioactive materials transportations.

OPS-4.6 Identify common "industrial radiography" sources and any specialized large quantity radioactive materials packages commonly transported through the local jurisdiction by their shapes and characteristics.

OPS-4.7 Identify at least four dispersion patterns that can be created upon release of a hazardous material. The following are examples:

1. Cloud or hemisphere
2. Plume
3. Cone
4. Stream or pooling
5. Irregular.

OPS-4.8 Identify the three general time frames for predicting the length of time that exposures may be in contact with the hazardous material in an endangered area to be:

1. Short-term (minutes and hours)
2. Medium-term (days, weeks and months)
3. Long-term (years).

OPS-4.9 Identify the health and physical hazards that could cause harm to include;

1. Thermal
2. Etiologic
3. Asphyxiation
4. Mechanical
5. Corrosive
6. Poisonous
7. Radiation

OPS-4.9.1 Identify the health hazards associated with the following terms:

1. Asphyxiant - cellular and pulmonary
2. Chronic health hazard

3. Convulsant
4. Irritants and corrosive
5. Sensitizer/allergen
6. Highly Toxic
7. Carcinogens
8. Infectious Agents.
9. Systemic toxins.
10. Mutagens
11. Teratogens
12. Alpha, beta gamma and neutron radiation.

OPS-4.10 Given the following types of warfare agents, identify the corresponding DOT hazard class and division:

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

Analyzing the Incident: Estimating the Potential Harm

OPS-5 Given simulated incidents involving hazardous materials, estimate the potential harm within the endangered area at a hazardous materials incident to include:

1. Determining the dimensions of the area
2. Estimating the number of exposures
3. Measuring or predicting concentrations of materials
4. Estimating the physical, health and safety hazards
5. Identifying the areas of potential harm
6. Estimating the potential outcomes

OPS-5.1 Identify a resource for determining the size of an endangered area surrounding conditions at a hazardous materials incident to include:

1. The current North America Emergency Response Guidebook
2. Facility pre-incident plume dispersion modeling results

OPS-5.2 Given the dimensions of the endangered area and the surrounding conditions at a hazardous materials incident, estimate the number and type of exposures within that endangered area.

OPS-5.3 Identify resources available for determining the concentrations of a released hazardous material within an endangered area.

OPS-5.4 Identify the factors for determining the extent of physical, health, and safety hazards within the endangered area of a hazardous materials incident given the concentration of the released hazardous material.

1. Surrounding conditions
2. Indication of the behavior of the hazardous material and its container
3. Degree of hazard

OPS-5.5 Describe the impact that time, distance and shielding have on exposure to radioactive materials specific to the expected dose rate.

OPS-5.6 Describe the prioritization of emergency medical care and removal of victims from the hazard area relative to exposure and contamination concerns.

Planning the Response: Describing Response Objectives for Hazardous Materials Incidents

- OPS-6** Given simulated facility and transportation hazardous materials problems, describe the first responder's response objectives for each problem.
- OPS-6.1** Identify the steps for determining the number of exposures that could be saved by the first responder with the resources provided by the authority having jurisdiction and operating in a defensive fashion, given an analysis of the hazardous materials problem, and the exposures already lost.
- OPS-6.2** Describe the steps for determining defensive response objective given an analysis of the hazardous materials incident.
- OPS-6.3** Describe how to assess the risk to response personnel for each hazard class in rescuing injured persons at a hazardous materials incident.

Planning the Response: Identifying Defensive Options

- OPS-7** Given simulated facility and transportation hazardous materials problems, identify the defensive options for each response objective.
- OPS-7.1** Identify the defensive options to accomplish a given response objective.
- OPS-7.2** Identify the purpose for, and the procedures, equipment, and safety precautions used with each of the following control techniques:
1. Absorption
 2. Dike, dam, diversion or retention
 3. Dilution
 4. Vapor dispersion
 5. Vapor suppression
 6. Remote valve shutoff.

Planning the Response: Determining Appropriateness of Personal Protective Equipment

- OPS-8** Given the name of a hazardous material involved and the anticipated type of exposure, determine whether available personal protective equipment is appropriate for implementing a defensive option.
- OPS-8.1** Identify the appropriate respiratory protection required for a given defensive option for the first responder at the operational level as positive pressure self-contained breathing apparatus.
- OPS-8.1.1** Identify the three types of respiratory protection and the advantages and limitations presented by the use of each at hazardous materials incidents.
- OPS-8.1.2** Identify the required physical capabilities and limitations of personnel working in positive pressure self-contained breathing apparatus.
- OPS-8.2** Identify the appropriate personal protective equipment required for a given defensive option.
- OPS-8.2.1** Identify skin contact hazards encountered at hazardous materials incidents.
- OPS-8.2.2** Identify the purpose, advantages, and limitations of the following protective clothing at hazardous materials incidents:

1. Structural fire fighting clothing
2. High temperature protective clothing
3. Chemical protective clothing
4. Liquid splash protective clothing
5. Vapor protective clothing

Planning the Response: Identifying Emergency Decontamination Procedures

- OPS-9** Given a plan of action for a hazardous materials incident, identify emergency decontamination procedures.
- OPS-9.1** Identify ways that personnel, personal protective equipment, apparatus and tools and equipment become contaminated.
- OPS-9.2** Describe how the potential for secondary contamination determines the need for emergency contamination procedures.
- OPS-9.3** Identify the purpose of emergency decontamination at hazardous materials incidents.
- OPS-9.4** Identify the advantages and limitations of emergency decontamination procedures.
- OPS-9.5** Identify appropriate, simple procedures for dealing with accident victims with life-threatening injuries who are known or suspected to be contaminated with radioactive material.
- OPS-9.6** Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's for decontamination of a large number of people exposed to hazardous materials
- OPS-9.7** Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Implementing the Planned Response: Establishing and Enforcing Scene Control Procedures

- OPS-10** Given scenarios for facility and/or transportation hazardous materials incidents identify how to establish and enforce scene control including control zones, emergency decontamination and communications.
- OPS-10.1** Identify the procedures for establishing scene control through control zones.
- OPS-10.2** Identify the criteria for determining the locations of the control zones at hazardous materials incidents.
- OPS-10.3** Identify the basic techniques for the following protective actions at hazardous materials incidents:
1. Evacuation
 2. Sheltering in-place
- OPS-10.4** Identify the considerations associated with locating emergency decontamination.
- OPS-10.5** Demonstrate the ability to perform emergency decontamination.
- OPS-10.6** Identify the items to be considered in a safety briefing prior to allowing personnel to work at the following:
1. Hazardous materials incident

2. Hazardous materials incident with criminal or terrorist activities

- OPS-10.6.1** Identify the items to be considered in a safety briefing prior to allowing for criminal or terrorist related incidents to include:
1. Secondary events intended to incapacitate or delay emergency responders
 2. Armed resistance
 3. Use of weapons
 4. Booby traps
 5. Secondary contamination from handling patients

Implementing the Planned Response: Initiating the Incident Management System (IMS)

OPS-11 initiate the response plan and Given a simulated facility and/or transportation hazardous materials incidents, incident management system (IMS) specified in the local emergency the organizations SOP's.

OPS-11.1 Identify the role of the responder at the operational level during hazardous materials incidents as specified in the local emergency response plan and the organizations SOP's.

OPS-11.2 Identify the levels of hazardous materials incidents as defined in the SERC Uniform Classification System for Categorizing Hazardous Materials Incidents.

1. Level 1 - Minor
2. Level 2 - Moderate
3. Level 3 - Major

OPS-11.3 Identify the purpose, need, benefits and elements of an IMS at hazardous materials incidents.

OPS-11.4 Identify the considerations for determining the location of the command post for a hazardous materials incident.

OPS-11.5 Identify the procedures for requesting additional resources at a hazardous materials incident.

OPS-11.6 Identify the responsibilities of the safety officer as follows:

1. Obtains a briefing from the Incident Commander
2. Advises the Incident Commander of incident safety considerations and dangerous situations
3. Monitors the implementation of incident safety considerations
4. Alters, suspends or terminates any activity that is deemed to be unsafe.

Implementing the Planned Response: Using Personal Protective Equipment

OPS-12 equipment Demonstrate the ability to don, work in and doff the personal protective provided by the authority having jurisdiction.

OPS-12.1 Identify the importance of the buddy system in implementing the planned defensive options.

OPS-12.2 Identify the importance of the backup personnel in implementing the planned defensive actions.

- OPS-12.3** Identify the safety precautions to be observed when approaching and working at hazardous materials incidents.
- OPS-12.4** Identify the signs and symptoms of heat and cold stress.
- OPS-12.5** Identify the physical capabilities required for and the limitations of personnel working in the personal protective equipment as provided by the authority having jurisdiction.
- OPS-12.6** Match the function of the operational components of the positive pressure self-contained breathing apparatus provided the responders to the name of the component.
- OPS-12.7** Identify the procedures for cleaning, sanitizing and inspecting respiratory protective equipment.
- OPS-12.8** Identify the procedures for donning, working in and doffing positive pressure self-contained breathing apparatus.
- OPS-12.9** Demonstrate donning, working in and doffing positive pressure self-contained breathing apparatus. (Note: This competency is for familiarization purposes only and additional, specific training in the safe use of positive pressure self-contained breathing apparatus is required.)

Implementing the Planned Response: Performing Defensive Control Actions

- OPS-13** Given a plan of action for a hazardous materials incident within their capabilities, demonstrate the ability to perform the defensive control actions set out in the plan.
- OPS-13.1** Understand the types of firefighting foam(s) or vapor suppressing agent(s) and foam equipment furnished by the authority having jurisdiction, understand the proper application of the firefighting foam(s) or vapor-suppressing agents on a spill or fire involving hazardous materials.
- OPS-13.2** Identify the characteristics and applicability of the following types of foams:
1. Protein
 2. Fluoroprotein
 3. Special purpose
 - a. Polar solvent alcohol-resistant concentrates.
 - b. Hazardous materials concentrates
 4. Aqueous film-forming foam (AFFF)
 5. High expansion.
- OPS-13.3** Given the appropriate tools and equipment, describe how to perform the following defensive control activities:
1. Absorption
 2. Damming, diking, diversion and retention
 3. Dilution
 4. Vapor dispersion
 5. Vapor suppression.
- OPS-13.4** Understand the location and use of the mechanical, hydraulic and air emergency remote shut-off devices.
- OPS-13.5** Describe the objectives and dangers of search and rescue missions at hazardous materials incidents.

- OPS-13.6** Describe methods for controlling the spread of radioactive contamination to limit impact.
- OPS-13.7** Describe procedures, such as those listed in the Local Emergency Response Plan or the organization's SOP's, to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Evaluating Progress: Evaluation the Status of Defensive Actions

- OPS-14** evaluate objectives. Given simulated facility and/or transportation hazardous materials incidents, the status of the defensive actions taken in accomplishing the response
- OPS-14.1** Identify the considerations for evaluating whether defensive options are effective in accomplishing the objectives.
- OPS-14.2** Describe the circumstances under which it would be prudent to withdraw (pull back) from a hazardous materials incident.

Evaluating Progress: Communicating the Status of the Planned Response

- OPS-15** Given simulated facility and/or transportation hazardous materials incidents, demonstrate communicating the status of the planned response to the incident commander through the normal chain of command.
- OPS-15.1** Identify the methods for communicating the status of the planned response to the incident commander through the normal chain of command.
- OPS-15.2** Identify the methods for immediate notification of the incident commander and other response personnel about critical emergency conditions at the incident.

The following training objectives are recommended for first responder EMS Level 2. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

In addition to the hazardous materials first responder operational level training, all EMS Level 2 responders will be trained in the following competencies:

EMS Responder Level 2

Recommended Training Objective

- EMS(2)-1** Given a hazardous materials incident scenario, demonstrate an understanding of the role of the Emergency Medical Service Responder Level 2.
- EMS(2)-1.1** Describe the responsibility of the Emergency Medical Service Responder 2 to analyze a hazardous material incident to determine the magnitude of the problem in terms of outcomes.
1. Determine the hazards present to the responder and the patient
 2. Assess the patient to determine the patient care needs and the risk of secondary contamination.
- EMS(2)-1.2** Describe the responsibility of the Emergency Medical Service Responder 2 to plan a response to provide the appropriate level of emergency medical care to persons

involved in hazardous materials incidents and to provide medical support to hazardous materials response personnel.

1. Define the role of the EMS Level 2 responder
2. Plan a response to provide emergency medical care in a hazardous materials incident
3. Determine appropriate personal protective equipment needed for EMS personnel

EMS(2)-1.3 Describe the responsibility of the Emergency Medical Service Responder 2 to implement the planned response:

1. Perform the preparations for receiving the contaminated patient
2. Provide treatment to the hazardous materials patient
3. Coordinate and manage the EMS component of the hazardous materials incident.

EMS(2)-1.4 Describe the responsibility of the Emergency Medical Service Responder 2 to terminate the incident.

Analyzing the Hazardous Materials Incident

EMS(2)-2 Given an emergency involving hazardous materials, determine the hazards present to both the responder and the patient in that situation.

EMS(2)-2.1 Define the following chemical and physical properties and describe their importance in the risk assessment process:

1. Boiling point
2. Flammable (explosive) limits (LEL/UFL, LFL/UFL)
3. Flash point
4. Ignition temperature
5. Specific gravity
6. Vapor density
7. Vapor pressure
8. Water solubility.

EMS(2)-2.2 Define the following radiological terms and explain their use in the risk assessment process:

1. Alpha radiation
2. Beta radiation
3. Gamma radiation
4. Radiological measurement units.

EMS(2)-2.3 Define the following toxicological terms and explain their use in the risk assessment process:

1. Threshold Limit Value (TLV-TWA)
2. Lethal Concentration and Lethal Doses (LC50 and LD50)
3. Parts per million/billion (ppm/ppb)
4. Immediately Dangerous to Life and Health (IDLH)
5. Permissible Exposure Limit (PEL)
6. Short-Term Exposure Limit (TLV-STEL)
7. Ceiling Level (TLV-C).

EMS(2)-2.4 Given a specific hazardous material and using the information available to the level 2 responder, demonstrate extracting appropriate information about the physical characteristics, chemical properties, hazards and suggested medical response considerations.

- EMS(2)-2.3** Given a hazardous materials incident with a patient(s), assess the patient and conditions to determine the risk of secondary contamination.
- EMS(2)-2.3.1** Identify sources of technical information for performance of patient decontamination.
- EMS(2)-3.2** Identify the factors that influence the decision of when and where to treat the patient and the extent of patient care, including the following:
1. Hazardous material toxicity
 2. Patient condition
 3. Availability of decontamination.
- EMS(2)-3.3** Given a scenario involving potential domestic terrorism, the responder shall determine the basic tools for identification of the substance, appropriate detection devices and local availability of such devices.
- EMS(2)-3.4** Given a scenario involving potential criminal or terrorist activity, describe procedures as listed in the local ERP or organization's SOP's to preserve evidence involving suspected criminal or terrorist acts at the hazardous materials incident.
- Planning the Response**
- EMS(2)-4** Given a plan of action by the incident commander, and a role in a hazardous materials incident as identified in the local ERP or the organization's SOP's describe the importance of coordination between various agencies at the scene.
- EMS(2)-5** Given a hazardous materials incident, plan a response to provide the appropriate level of emergency care to persons involved in hazardous materials incidents and to provide support to hazardous materials support personnel.
- EMS(2)-5.1** Given a hazardous materials incident scenario, assess the problem and formulate and implement a plan that includes the following:
1. EMS control activities
 2. EMS component of the IMS
 3. Medical monitoring of personnel using personal protective clothing
 4. Triage and medical treatment of chemically contaminated individuals including proper decontamination
 5. Product and exposure information gathering and documentation.
- EMS(2)-5.2** Describe the importance of pre-incident planning relating to specific areas.
- EMS(2)-5.3** Describe the hazards and precautions to be observed when approaching a hazardous materials incident.
- EMS(2)-5.4** Describe the considerations associated with the placement, location, and setup of the patient decontamination site.
- EMS(2)-5.5** Explain the advantages and limitations of techniques of various decontamination procedures:
1. Absorption
 2. Chemical degradation
 3. Dilution
 4. Isolation.
- EMS(2)-5.6** Describe when it may be prudent to withdraw (pull back) from a hazardous materials incident.

- EMS(2)-5.7** Describe impact that time, distance and shielding have on radioactive materials exposure specific to the expected dose rate.
- EMS(2)-5.8** Describe the prioritization of emergency medical care and removal of victims from the hazard area relative to exposure and contamination concerns.
- EMS(2)-6** Given the name of the hazardous material and the type, duration and extent of exposure determine if the personal protective equipment available to EMS is appropriate to implement the planned response.
- EMS(2)-6.1** Identify the advantages and dangers of search and rescue missions at hazardous materials incidents.
- EMS(2)-6.2** Identify the advantages and hazards associated with the rescue, extrication and removal of a victim from a hazardous materials incident.
- EMS(2)-6.3** Describe the types, application use and limitations of protective clothing used by EMS personnel at hazardous materials incidents.
- EMS(2)-6.4** Demonstrate how to interpret a chemical compatibility chart for chemical protective clothing.

Implementing the Planned Response

- EMS(2)-7** Given a plan for providing patient care at a hazardous materials incident, perform the preparations necessary to receive the patient for decontamination, treatment and transport.
- EMS(2)7.1** Given a plan for providing patient care, demonstrate the proper donning, doffing, and use of personal protective equipment.
- EMS(2)-8** At the scene of a hazardous materials incident, provide or coordinate the patients care
- EMS(2)-8.1** Given a simulated hazardous materials incident and using locally available resources, demonstrate the implementation and execution of patient decontamination procedures.
- EMS(2)-8.2** Explain the principles of emergency decontamination and its application to critically ill patients.
- EMS(2)-8.3** Demonstrate the ability to coordinate patient care activities including treatment, disposition and transport of patients.
- EMS(2)-9** Given a simulated hazardous materials incident, demonstrate the ability to establish and manage the EMS component of an incident management system (IMS).
- EMS(2)-10** Given a hazardous materials scenario, perform medical support of hazardous materials incident response personnel.
- EMS(2)-10.1** Identify the components of pre-entry and post-entry assessment to include the following:
1. Vital signs
 2. Body weight
 3. General health
 4. Medications
 5. Neurological status

6. EKG.

- EMS(2)-10.2** Identify the following factors and how they influence heat stress for response personnel:
1. Hydration
 2. Physical fitness
 3. Environmental factors
 4. Activity levels
 5. Level of PPE
 6. Duration of entry.
- EMS(2)-10.3** Identify the medical monitoring protocols and demonstrate medical monitoring procedures for hazardous materials personnel at the scene.
- EMS(2)-10.4** Define the criteria for site selection of a medical monitoring station at the scene of a hazardous materials incident.
- EMS(2)-10.5** Demonstrate the ability to set up and operate a medical monitoring station at the scene of a hazardous materials incident.
- EMS(2)-10.6** Demonstrate the ability to interpret and analyze data obtained from a medical monitoring station at the scene of a hazardous materials incident.
- EMS(2)-10.7** Demonstrate proper documentation of medical monitoring at the scene of a hazardous materials incident.
- EMS(2)-10.8** Describe how a rehabilitation sector is established and what activities need to take place.

Terminating the Incident

- EMS(2)-11** Upon the termination of a hazardous materials incident, shall complete the reporting, documentation, and EMS termination activities as required by the local emergency response plan or the organization's SOPs.
- EMS(2)-11.1** Given plans and SOPs, describe the information regarding incident EMS activities that should be relayed through the chain of command to the incident commander to include:
1. Patient numbers, conditions and disposition
 2. Number of response personnel screened
 3. Adverse reactions noted
 4. Personnel transported for further treatment
 5. Completed records
 6. Recommended medical, physical and psychological needs for immediate rehabilitation
 7. Availability of EMS personnel and equipment.
- EMS(2)-11.2** Describe the activities required in terminating the EMS component of a hazardous materials incident.
- EMS(2)-11.3** Describe the process and demonstrate the ability to conduct the EMS portion of an incident critique.
- EMS(2)-11.4** Describe the process of making revisions to EMS operating procedures and response capabilities as a result of information learned.
- EMS(2)-12** Describe the necessary procedures required to decontaminate all equipment to render it back in service and the proper disposal of equipment that requires the same.

Summary EMS Responder Level 2

Audience

Moderate size training audience. Paramedics and EMTs who may be called upon to conduct decontamination and patient care in the warm zone of a hazardous materials incident.

Prerequisites

First Responder Awareness training (29CFR1910.120(q)(i))
First Responder Operational training (29CFR1910.120(q)(ii))
EMS Responder Level 1 training

Training

- Classroom, physical skill lab and simulator / field instruction, with emphasize on decision making and treatment skills.
- Competencies:
 - ◆ Assessing incident scene hazards and risk of patient secondary contamination.
 - ◆ Incident scene response planning including determining personal protective equipment needs and defining roles and responsibilities of EMS Level 2 responders.
 - ◆ Ability to perform EMS Level 2 patient decontamination and treatment in the warm zone (contamination reduction zone) of an incident scene.
 - ◆ Ability to perform post-incident EMS reporting, documentation and follow-up.

Refresher Programs

1. Technical updates
2. Change in response protocols and incident command system SOPs.
3. Renewal and retesting of incident scene decision making and warm zone decontamination and treatment skills.

FLORIDA STATE EMERGENCY RESPONSE COMMISSION

Guidelines for Law Enforcement Officers Hazardous Materials Training

October 1, 2002
~Revised~



Guidelines for Law Enforcement Officers Hazardous Materials Training

Introduction

Law Enforcement Officers at the awareness level shall be trained to meet the competencies of the awareness level. In addition, Law Enforcement Officers at the awareness level shall receive training to meet requirements of the Occupational Safety and Health Administration (OSHA), Florida Department of Law Enforcement, Florida Department of Environmental Protection, and the US. Environmental Protection Agency (EPA) as appropriate for their jurisdictions. Law Enforcement Officers that respond or can be expected to respond to a hazardous materials incident must be knowledgeable of 29 CFR 1910.120 and 40 CFR 311 training and emergency response requirements.

Definition

Law Enforcement Officers at the awareness level are personnel who are likely to discover or witness a hazardous materials emergency, or in the normal course of their duties may be the first on the scene of an emergency involving hazardous materials. Law Enforcement Officers at the awareness level are expected to recognize hazardous materials are present, protect themselves, call for trained personnel, and secure the area. The most important duty of these personnel is to make proper notification in order to begin the emergency response sequence. This level of training anticipates a response role that involves no potential for exposure to the hazards related to the hazardous materials involved in an incident.

Audience

All Law Enforcement Officers who normally patrol, or who may be called upon to respond to the scene of an incident to perform duties associated with cold zone activities in support of an incident command system. Cold zone activities may include the security of perimeters, evacuation efforts, security of evacuated areas, participation within the incident command system, traffic control, etc., and must be consistent with the local emergency response plan or organization's Standard Operating Procedures.

Related Health and Safety Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)
EPA 40 CFR 311 Worker Protection
NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents. 2002 Edition
NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents.
2002 Edition
NETC Guidelines for Public Sector Hazardous Materials Training. March 1998

Appropriate Methodologies

Law Enforcement Officer Awareness training should be conducted using a mix of lecture and media presentations with individual and small group exercises. The exercises should consist of activities practicing identification and recognition of hazardous materials from scenario descriptions and using information sources such as the North American Emergency Response Guidebook to establish the presence of hazardous materials in the scenarios. Competency should be measured by written examination.

Refresher training occurring annually should focus on skill renewal in using information sources to recognize and identify hazardous materials.

The SERC estimates that the initial training can be accomplished in approximately 8 contact hours with competent instructors knowledgeable in hazardous materials response. Annual refresher should be accomplishable with approximately 4 contact hours of training. However, 8 hours would be preferred.

The Florida Department of Law Enforcement requires the individual to recertify every four years. It is recommended that the individual be required to demonstrate proof of refresher training consistent with the standards and that all Law Enforcement Agencies and Law Enforcement training institutions be required to issue certificates of training for compliance with initial and refresher hazardous materials training.

Training

All Law Enforcement Officers will be trained to the awareness level utilizing the Florida First Responder Awareness Level Hazardous Materials Training Program, National Fire Academy Program - Initial Response to Hazardous Materials Incidents: Basic Concepts or similar curricula complying with the First Responder Awareness Level as defined in 29 CFR 1910.120.

The following training objectives are recommended for first responder awareness level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

Law Enforcement Level 1

All Law Enforcement Officers will be trained to meet the following competencies as a minimum:

Recommended Training Objectives

- LAW-1** Given a hazardous materials incident scenario, demonstrate an understanding of the role of the Law Enforcement Officer at the awareness level.
- LAW-1.1** Describe the responsibility to analyze the incident to determine the hazardous materials present and the basic hazard and response information for each type of hazardous material, and demonstrate the ability to do the following:
 - LAW-1.1.1** Identify the responsibility to detect the presence of hazardous materials.
 - LAW-1.1.2** Identify the responsibilities to survey a hazardous materials incident, from a safe location, to identify the name, UN/NA identification number or type placard applied for any hazardous material involved.
 - LAW-1.1.3** Identify the responsibility to collect hazard information from the current edition of the *North American Emergency Response Guidebook* (ERG).
- LAW-1.2** Describe the responsibility to implement actions consistent with the local emergency response plan, the organization's SOP's and the current edition of the *North American Emergency Response Guidebook* and demonstrate the ability to do the following:
 - LAW-1.2.1** Identify the responsibility to initiate protective actions consistent with the local emergency response plan, the organization's SOP's, and the current edition of the *North American Emergency Response Guidebook*.
 - LAW-1.2.2** Identify the responsibility to initiate the notification process specified in the local emergency response plan and the organization's SOP's.

Analyzing the Incident – Detecting the Presence of Hazardous Materials

- LAW-2** Given incident scenarios involving facility and/or transportation situations with and without hazardous materials present, identify those situations where hazardous materials are present.
- LAW-2.1** Identify the definition of hazardous materials.
- LAW-2.2** Identify the USDOT Hazard Classes and divisions of hazardous materials and identify common examples of each hazard class or division.
- LAW-2.3** Identify the primary hazards associated with each of the USDOT Hazard Classes and divisions of hazardous materials by hazard class or division.
- LAW-2.4** Identify the difference between hazardous materials emergencies and other emergencies.
- LAW-2.5** Identify typical occupancies and locations in the community where hazardous materials are manufactured, stored, transported, used or disposed of.
- LAW-2.6** Identify typical container shapes that may indicate hazardous materials.
- LAW-2.7** Identify facility and transportation markings and colors that indicate hazardous materials, including:
1. UN/NA identification number
 2. NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, markings
 3. Military hazardous materials markings
 4. Special hazard communication markings
 5. Pipeline marker
 6. Container markings.
- LAW-2.8** Given an NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response marking, identify the significance of the colors, numbers and special symbols.
- LAW-2.9** Identify U.S. and Canadian placards and labels that indicate hazardous materials.
- LAW-2.10** Identify the basic information on material safety data sheets (MSDS) and shipping papers that indicate hazardous materials.
- LAW-2.10.1** Identify where to find material safety data sheets (MSDS).
- LAW-2.10.2** Identify entries on a material safety data sheet that indicate the presence of hazardous materials.
- LAW-2.10.3** Identify the entries on shipping papers that indicate the presence of hazardous materials.
- LAW-2.10.4** Match the name of the shipping papers found in transportation (air, highway, rail and water).
- LAW-2.10.5** Identify the person responsible for having the shipping papers in each mode of transportation.
- LAW -2.10.6** Identify where the shipping papers are found in each mode of transportation.

- LAW-2.10.7** Identify where the papers can be found in an emergency in each mode of transportation.
- LAW -2.11** Identify examples of clues (other than occupancy/location, container shape, markings/color, placards/labels, and shipping papers) that use the senses of sight, sound, and odor to indicate the presence of hazardous materials.
1. Changes in pressure release
 2. Presence of smoke and/or fire
 3. Presence of liquids, gas leaks, or vapor cloud
 4. Chemical reactions
 5. Condensation lines
 6. Mass Casualties.
- LAW-2.12** Describe the limitations of using the senses in determining the presence or absence of hazardous materials.
- LAW-2.13** Identify types of locations that may become targets for criminal or terrorist activity using hazardous materials.
The following are some examples of locations:
1. Public assembly areas
 2. Public/Government buildings
 3. Mass transit systems
 4. Places with high economic impact
 5. Telecommunications facilities
 6. Places with historical or symbolic significance
 7. Military facilities
 8. Airports, Train Stations and Ports
 9. Industrial facilities.
- LAW-2.14** Identify at least four indicators of possible criminal or terrorist activity involving hazardous materials.
The following are some examples of indicators:
1. Hazardous materials or lab equipment that is not relevant to the occupancy
 2. Intentional release of hazardous materials
 3. Unexplained patterns of sudden onset illnesses or deaths
 4. Unusual orders or tastes
 5. Mass casualty incident with unexplained signs of skin, eye or airway irritation
 6. Unusual security, locks, bars on windows, covered windows and barbed wire
 7. Unexplained vapors clouds, mists and plumes
 8. Patients twitching, tightness in chest, sweating, pin-point pupils (miosos), runny nose (rhinorrhea) and nausea ad vomiting.
 9. Unusual presence of natural indicator such as sick or dead birds and animals or dead or discolored trees, shrubs or grass.
- LAW-2.15** Describe the difference between a chemical and a biological incident.
1. Chemical incidents are identified by the rapid onset of medical signs and systems characteristic of chemical exposure. Natural indicators and obvious signs of release may be present such as chemical residue and odors.
 2. Biological incidents are gradual in onset of medical signs and systems with no obvious characteristic of odor or colors. The migration of the disease by infected individuals may be wide spread and transmission from one person to another may occur.
- LAW-2.16** Identify at least four indicators of possible criminal or terrorist activity involving biological agents.
The following are some examples of indicators:

1. Mass causality incident with unusual number of ill or dying persons with common signs and symptoms.
2. Hospitals reporting mass casualties with similar signs and symptoms.
3. Unscheduled outdoors spraying
4. Abandoned spraying (dissemination) device.

Analyzing the Incident – Surveying the Hazardous Materials Incident from a Safe Location

- LAW-3** Given simulated facility and transportation incidents involving hazardous materials, identify the hazardous material(s) in each situation by name, UN/NA identification number and/or type placard applied.
- LAW-3.1** Identify difficulties encountered in determining the specific names of hazardous materials in both facilities and transportation.
- LAW-3.2** Identify the significance of the terms “Type A”, “Type B” and “Special Form” as they relate to radioactive materials packaging.
- LAW-3.3** Identify additional information concerning radionuclide identity and activity provided on radioactive material labels and shipping papers.
- LAW-3.4** Identify additional information concerning physical and chemical form and packaging type provided on radioactive materials shipping papers.
- LAW -3.5** Identify sources for obtaining the names of, UN/NA identification numbers for or type of placards associated with hazardous materials in transportation.
- LAW-3.6** Identify sources for obtaining the names of hazardous materials in a facility.

Analyzing the Incident – Collecting Hazard Information

- LAW-4** Given the identity of various hazardous materials (name, UN/NA number or type placard), identify the fire, explosion, and health hazard information for each material using the current edition of the *North American Emergency Response Guidebook*.
- LAW-4.1** Identify the way hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- LAW-4.2** Identify the general routes of entry for human exposure to hazardous materials.
- LAW-4.3** Given the current edition of the *North American Emergency Response Guidebook*, identify the three methods for determining the appropriate guide page for a specific hazardous material.
- LAW-4.4** Given the current edition of the *North American Emergency Response Guidebook*, identify the two general types of hazards found on each guide page.
- LAW-4.5** Identify the difficulties encountered in using the senses to recognize radioactive material releases and radiation exposure.

Analyzing the Incident – Initiating Protective Actions

- LAW-5** Given simulated facility and transportation hazardous materials incidents, identify the actions to be taken to protect themselves and others and to control access to the scene using the local emergency response plan, the organization's SOP's, or the current edition of the *North American Emergency Response Guidebook*.
- LAW-5.1** Identify the location of both the local emergency response plan and the organization's SOP's.
- LAW-5.2** Given the local emergency response plan or the organization's SOP's, identify the role of the Law Enforcement Officer at the awareness level during a hazardous material incident.
- LAW-5.2.1** Given a simulated facility and/or transportation hazardous materials incidents, initiate the Incident Management System (IMS) specified in the local emergency response plan and the organizations SOP's.
- LAW-5.2.2** Identify the basic techniques for the following protective actions at hazardous materials incidents:
1. Evacuation
 2. In-place protection.
- LAW-5.3** Given the local emergency response plan or the organization's SOP's, identify the basic precautions to be taken to protect themselves and others in a hazardous materials incident.
- LAW-5.3.1** Identify circumstances involving radioactive material in transportation where actions should be initiated to protect the lives of accident victims through carrying out rescue and providing emergency medical care.
- LAW-5.3.2** Identify the precautions necessary when providing emergency medical care to victims of hazardous materials incidents.
- LAW-5.3.3** Identify typical ignition sources found at scenes of hazardous materials incidents.
- LAW-5.3.4** Identify the ways hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- LAW -5.3.5** Identify the general routes of entry for human exposure to hazardous materials.
- LAW-5.4** Given the identity of various hazardous materials (name, UN/NA identification number or type placard), identify the following response information using the current edition of the *North American Emergency Response Guidebook*:
- a. Emergency Action (fire, spill, leak and first aid)
 - b. Personal protective equipment necessary
 - c. Initial isolation and protective action distances
- LAW-5.4.1** Given the name of a hazardous material (name, UN/NA identification number or type placard), identify the following response information:
1. Street clothing and work uniforms
 2. Structural fire-fighting protective clothing
 3. Positive pressure self-contained breathing apparatus (SCBA)
 4. Chemical-protective clothing and equipment
- LAW-5.4.2** Identify the definitions for each of the following protective actions:
1. Isolation of the hazard area and denial of entry

2. Evacuation
3. Sheltering in-place protection.

LAW-5.4.3 Identify the shapes of recommended initial isolation and protective action zones.

LAW-5.4.4 Describe the difference between small and large spills as found in the table of Initial Isolation and Protective Actions Distances.

LAW-5.4.5 Identifying the circumstances under which the following distances are used at a hazardous materials incident:

1. Table of initial isolation and protective action distances
2. Isolation distances in the numbered guides.

LAW-5.4.6 Given a copy of the current edition of the *North American Emergency Response Guidebook*, describe the difference between the isolation distances in the orange-bordered guide pages and the protective action distances in the green-bordered pages in the document.

LAW-5.5 Identify the techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials incidents.

LAW-5.6 Identify the specific actions necessary when an incident is suspected to involve criminal or terrorist activity.

The following are some examples:

1. Take self protective actions
2. Be alert to secondary devices
3. Communicate the suspicion during the notification process
4. Establish work control zones and access control points
5. Isolate potentially exposed people
6. Document the initial observation
7. Prevent secondary contamination
8. Attempt to preserve evidence while performing operational duties.

Implementing the Response – Initiating the Notification Process

LAW-6 Given either a facility or transportation scenario of hazardous materials incidents, with and without criminal or terrorist activities, identify the appropriate notifications to be made and how to make them, consistent with the local emergency response plan or the organization's SOP's.

LAW-6.1 Identify the initial notification procedures for hazardous materials incidents in the local emergency response plan or the organization's SOP's.

LAW-6.2 Identify the procedures, equipment and safety precautions for collecting legal evidence at hazardous materials incidents.

Summary: Law Enforcement Officer Awareness Level

Audience

Large training audience. All current officers and recruit candidates who respond to, or may encounter in the normal course of their duties, incidents involving hazardous materials.

Prerequisites

None

Training

Classroom, utilizing lecture with discussion and media presentations. Individual and small group exercises with instructor guidance. Competency testing by written examination.

Refresher Training

To occur annually:

1. Technical updates
2. Changes in emergency response plan, SOP's and incident command procedures
3. Ability to perform awareness level competencies in the cold zone.

FLORIDA STATE EMERGENCY RESPONSE COMMISSION

Guidelines for Firefighters Hazardous Materials Training

October 1, 2002
~Revised~



Guidelines for Firefighters Hazardous Materials Training

Introduction

Firefighters shall be trained to meet all the competencies of the awareness and operational levels, as defined in OSHA 29 CFR 1910.120(q). In addition, Firefighters at the operational level shall receive training to meet requirements of the Occupational Safety and Health Administration (OSHA, Florida Department of Insurance, Florida Department of Environmental Protection, and the US. Environmental Protection Agency (EPA) as appropriate for their jurisdictions. Firefighters that respond or can be expected to respond to a hazardous materials incident must be knowledgeable of 29 CFR 1910.120 and 40 CFR 311 training and emergency response requirements.

Definition

Firefighters at the operational level are personnel who respond to releases or potential releases, as part of the initial response to protect life, property, and the environment from the effects of a hazardous materials emergency. Operational level Firefighters are trained to take defensive actions rather than stop the release. Their function is to confine the release from a safe distance, keep it from spreading, and prevent exposures. Firefighters at the operational level must have knowledge of the awareness level. The awareness level competencies are included in this document for reference, it must be understood that the operational level builds upon the knowledge obtained during awareness level training.

Audience

All Firefighters who may be called upon to respond to a hazardous materials incident. Firefighters at the operational level are typically those persons who are first to arrive at the scene of a hazardous materials incident. Generally, they are not members of a hazardous materials response team.

Related Health and Safety Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)
EPA 40 CFR 311 Worker Protection
NETC Guidelines for Public Sector Hazardous Materials Training, March 1998
NFPA 471, Recommended Practice for Responding to Hazardous Materials Incident (2002 Edition)
NFPA 472, Standard for Competencies for Hazardous Materials Responders (2002 Edition)
NFPA 1561 Standard on Fire Department Incident Management System

Appropriate Methodologies

Firefighter operational level training is best conducted in a classroom environment with opportunities for small and large group exercises either in classroom or field exercise in conjunction with the training. Training awareness level in conjunction with operational level is acceptable. Lectures with small group activities are appropriate instructional delivery of much of the material. However, incident scene organization and command drill and practice will require large group simulated incidents which are best conducted in a simulator or as a field exercise.

Refresher training occurring annually should include: (1) competency retesting of all response skills, (2) technical information updates, and (3) critique of incident scene decision-making using simulated emergencies.

The SERC estimates that the initial training outlined above can be accomplished in a minimum of 16 hours with competent instructors knowledgeable in hazardous materials response when personnel are trained to the awareness level. The minimum of 24 hours for new/recruit and previously untrained firefighters is recommended. Annual refresher should be accomplished with a minimum of 8 hours training.

The Florida Department of Insurance, Florida State Fire Marshal's Office, currently requires a minimum of 24 hours for recruit firefighters seeking a Firefighter Certificate of Compliance. All career firefighters are required to maintain a certificate of compliance. With the adoption of this document we hope to encourage the volunteer fire service agencies of Florida to seek the same level of training in order to ensure personal safety during a hazardous materials incident in compliance with 29 CFR 1910.120 and 40 CFR 311.. Fire Service agencies and Fire Service training institutions should be required to issue certificates of training for compliance with both initial and refresher hazardous materials training.

Training

Employers, including volunteer agency responsible parties, are required to ensure that Firefighters demonstrate competency in the skills required. All Firefighters will be trained to the operational level utilizing the Florida First Responder Operational Level Hazardous Materials Training Program, National Fire Academy Program - Initial Response to Hazardous Materials Incidents: Basic Concepts and Concept Implementation or similar curricula complying with the First Responder Awareness and Operational Level as defined in 29 CFR 1910.120 *and* NFPA 472.

The following training objectives are recommended for first responder awareness level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

Firefighters will be trained to meet all the following competencies as a minimum:

For the purpose of clarification, the prerequisite awareness competencies are included below.

Recommended Training Objectives

First Responder Awareness

- AWARE-1** Given a hazardous materials incident scenario, demonstrate an understanding of the role of the Firefighter at the awareness level.
- AWARE-1.1** Describe the responsibility to analyze the incident to determine the hazardous materials present and the basic hazard and response information for each type of hazardous material, and demonstrate the ability to do the following:
 - AWARE-1.1.1** Identify the responsibility to detect the presence of hazardous materials.
 - AWARE-1.1.2** Identify the responsibilities to survey a hazardous materials incident, from a safe location, to identify the name, UN/NA identification number or type placard applied for any hazardous material involved.
 - AWARE-1.1.3** Identify the responsibility to collect hazard information from the current edition of the *North American Emergency Response Guidebook* (ERG).
- AWARE-1.2** Describe the responsibility to implement actions consistent with the local emergency response plan, the organization's SOP's and the current edition of the *North American Emergency Response Guidebook*, and demonstrate the ability to do the following:
 - AWARE-1.2.1** Identify the responsibility to initiate protective actions consistent with the local emergency response plan, the organization's SOP's, and the current edition of the *North American Emergency Response Guidebook*.

AWARE-1.2.2 Identify the responsibility to initiate the notification process specified in the local emergency response plan and the organization's SOP's.

Analyzing the Incident - Detecting the Presence of Hazardous Materials

AWARE-2 Given incident scenarios involving facility and/or transportation situations with and without hazardous materials present, identify those situations where hazardous materials are present.

AWARE-2.1 Identify the definition of hazardous materials.

AWARE-2.2 Identify the USDOT Hazard Classes and divisions of hazardous materials and identify common examples of each hazard class or division.

AWARE-2.3 Identify the primary hazards associated with each of the USDOT Hazard Classes and divisions of hazardous materials by hazard class or division.

AWARE-2.4 Identify the difference between hazardous materials emergencies and other emergencies.

AWARE-2.5 Identify typical occupancies and locations in the community where hazardous materials are manufactured, stored, transported, used, or disposed of.

AWARE-2.6 Identify typical container shapes that may indicate hazardous materials.

AWARE-2.7 Identify facility and transportation markings and colors that indicate hazardous materials, including:

1. UN/NA identification number
2. NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, markings
3. Military hazardous materials markings
4. Special hazard communication markings
5. Pipeline marker
6. Container markings.

AWARE-2.8 Given an NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response marking, identify the significance of the colors, numbers and special symbols.

AWARE-2.9 Identify US. and Canadian placards and labels that indicate hazardous materials.

AWARE-2.10 Identify the basic information on material safety data sheets (MSDS) and shipping papers that indicate hazardous materials.

AWARE-2.10.1 Identify where to find material safety data sheets (MSDS).

AWARE-2.10.2 Identify entries on a material safety data sheet that indicate the presence of hazardous materials.

AWARE-2.10.3 Identify the entries on shipping papers that indicate the presence of hazardous materials.

AWARE-2.10.4 Match the name of the shipping papers found in transportation (air, highway, rail and water).

AWARE-2.10.5 Identify the person responsible for having the shipping papers in each mode of transportation.

AWARE-2.10.6 Identify where the shipping papers are found in each mode of transportation.

AWARE-2.10.7 Identify where the papers can be found in an emergency in each mode of transportation.

AWARE-2.11 Identify examples of clues (other than occupancy/location, container shape, markings/color, placards/labels, and shipping papers) that use the senses of sight, sound and odor to indicate the presence of hazardous materials.

1. Changes in pressure release
2. Presence of smoke and/or fire
3. Presence of liquids, gas leaks, or vapor cloud
4. Chemical reactions
5. Condensation lines
6. Mass Casualties.

AWARE-2.12 Describe the limitations of using the senses in determining the presence or absence of hazardous materials.

AWARE-2.13 Identify types of locations that may become targets for criminal or terrorist activity using hazardous materials. The following are some examples of locations:

1. Public assembly areas
2. Public/Government buildings
3. Mass transit systems
4. Places with high economic impact
5. Telecommunications facilities
6. Places with historical or symbolic significance
7. Military facilities
8. Airports, Train Stations and Ports
9. Industrial facilities.

AWARE-2.14 Identify at least four indicators of possible criminal or terrorist activity involving hazardous materials.

The following are some examples of indicators:

1. Hazardous materials or lab equipment that is not relevant to the occupancy
2. Intentional release or hazardous materials
3. Unexplained patterns of sudden onset illnesses or deaths
4. Unusual orders or tastes
5. Mass casualty incident with unexplained signs of skin, eye or airway irritation
6. Unusual security, locks, bars on windows, covered windows and barbed wire
7. Unexplained vapors clouds, mists and plumes
8. Patients twitching, tightness in chest, sweating, pin-point pupils (miosos), runny nose (rhinorrhea) and nausea and vomiting.
9. Unusual presence of natural indicator such as sick or dead birds and animals or dead or discolored trees, shrubs or grass.

AWARE-2.15 Describe the difference between a chemical and a biological incident.

1. Chemical incidents are identified by the rapid onset of medical signs and symptoms characteristic of chemical exposure. Natural indicators and obvious signs of release may be present such as chemical residue and odors.
2. Biological incidents are gradual in onset of medical signs and symptoms with no obvious characteristic of odor or colors. The migration of the disease by infected individuals may be wide spread and transmission from one person to another may occur.

- AWARE-2.16** Identify at least four indicators of possible criminal or terrorist activity involving biological agents.
The following are some examples of indicators:
1. Mass causality incident with unusual number of ill or dying persons with common signs and symptoms.
 2. Hospitals reporting mass casualties with similar signs and symptoms.
 3. Unscheduled outdoors spraying
 4. Abandoned spraying (dissemination) device.

Analyzing the Incident: Surveying the Hazardous Materials Incident from a Safe Location

- AWARE-3** Given simulated facility and transportation incidents involving hazardous materials, identify the hazardous material(s) in each situation by name, UN/NA identification number, and/or type placard applied.
- AWARE-3.1** Identify difficulties encountered in determining the specific names of hazardous materials in both facilities and transportation.
- AWARE-3.2** Identify the significance of the terms “Type A”, “Type B” and “Special Form” as they relate to radioactive materials packaging.
- AWARE-3.3** Identify additional information concerning radionuclide identity and activity provided on radioactive material labels and shipping papers.
- AWARE-3.4** Identify additional information concerning physical and chemical form and packaging type provided on radioactive materials shipping papers.
- AWARE-3.5** Identify sources for obtaining the names of, UN/NA identification numbers for or type of placards associated with hazardous materials in transportation.
- AWARE-3.6** Identify sources for obtaining the names of hazardous materials in a facility.

Analyzing the Incident: Collecting Hazard Information

- AWARE-4** Given the identity of various hazardous materials (name, UN/NA number or type placard), identify the fire, explosion, and health hazard information for each material using the current edition of the *North American Emergency Response Guidebook*.
- AWARE-4.1** Identify the way hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- AWARE-4.2** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-4.3** Given the current edition of the *North American Emergency Response Guidebook*, identify the three methods for determining the appropriate guide page for a specific hazardous material.
- AWARE-4.4** Given the current edition of the *North American Emergency Response Guidebook*, identify the two general types of hazards found on each guide page.
- AWARE-4.5** Identify the difficulties encountered in using the senses to recognize radioactive material releases and radiation exposure.

Analyzing the Incident – Initiating Protective Actions

- AWARE-5** Given simulated facility and transportation hazardous materials incidents, identify the actions to be taken to protect themselves and others and to control access to the scene using the local emergency response plan, the organization's SOP's, or the current edition of the *North American Emergency Response Guidebook*.
- AWARE-5.1** Identify the location of both the local emergency response plan and the organization's SOP's.
- AWARE-5.2** Given the local emergency response plan or the organization's SOP's, identify the role of the first responder at the awareness level during a hazardous material incident.
- AWARE-5.2.1** Given a simulated facility and/or transportation hazardous materials incidents, initiate the Incident Management System (IMS) specified in the local emergency response plan and the organizations SOP's.
- AWARE-5.2.2** Identify the basic techniques for the following protective actions at hazardous materials incidents.
1. Evacuation
 2. In-place protection.
- AWARE-5.3** Given the local emergency response plan or the organization's SOP's, identify the basic precautions to be taken to protect themselves and others in a hazardous materials incident.
- AWARE-5.3.1** Identify circumstances involving radioactive material in transportation where actions should be initiated to protect the lives of accident victims through carrying out rescue and providing emergency medical care.
- AWARE-5.3.2** Identify the precautions necessary when providing emergency medical care to victims of hazardous materials incidents.
- AWARE-5.3.3** Identify typical ignition sources found at scenes of hazardous materials incidents.
- AWARE-5.3.4** Identify the ways hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- AWARE-5.3.5** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-5.4** Given the identity of various hazardous materials (name, UN/NA identification number or type placard), identify the following response information using the current edition of the *North American Emergency Response Guidebook*:
- a. Emergency Action (fire, spill, leak and first aid)
 - b. Personal protective equipment necessary
 - c. Initial isolation and protective action distances.
- AWARE-5.4.1** Given the name of a hazardous material identify the recommended personal protective equipment from the following list:
1. Street clothing and work uniforms
 2. Structural fire-fighting protective clothing
 3. Positive pressure self-contained breathing apparatus (SCBA)
 4. Chemical-protective clothing and equipment.
- AWARE-5.4.2** Identify the definitions for each of the following protective actions:
1. Isolation of the hazard area and denial of entry

2. Evacuation
3. Sheltering in-place protection.

AWARE-5.4.3 Identify the shapes of recommended initial isolation and protective action zones.

AWARE-5.4.4 Describe the difference between small and large spills as found in the table of Initial Isolation and Protective Actions Distances.

AWARE-5.4.5 Identifying the circumstances under which the following distances are used at a hazardous materials incident:

1. Table of initial isolation and protective action distances
2. Isolation distances in the numbered guides.

AWARE-5.4.6 Given a copy of the current edition of the *North American Emergency Response Guidebook*, describe the difference between the isolation distances in the orange-bordered guide pages and the protective action distances in the green-bordered pages in the document.

AWARE-5.5 Identify the techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials incidents.

AWARE-5.6 Identify the specific actions necessary when an incident is suspected to involve criminal or terrorist activity.

The following are some examples:

1. Take self protective actions
2. Be alert to secondary devices
3. Communicate the suspicion during the notification process
4. Establish work control zones and access control points
5. Isolate potentially exposed people
6. Document the initial observation
7. Prevent secondary contamination
8. Attempt to preserve evidence while performing operational duties

Implementing the Response – Initiating the Notification Process

AWARE-6 Given either a facility or transportation scenario of hazardous materials incidents, with and without criminal or terrorist activities, identify the appropriate notifications to be made and how to make them, consistent with the local emergency response plan or the organization's SOP's.

AWARE-6.1 Identify the initial notification procedures for hazardous materials incidents in the local emergency response plan or the organization's SOP's.

The following training objectives are recommended for first responder operational level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

In addition to the hazardous materials first responder awareness level training, all firefighters will be trained in the following competencies:

First Responder Operational level competencies:

Recommended Training Objectives

OPS-1 Given a hazardous materials incident scenario, demonstrate an understanding of the Firefighter at the operations level.

- OPS-1.1** Describe the responsibility to analyze the hazardous materials incident and determine the magnitude of the problem in terms of outcomes and demonstrate the ability to do the following:
- OPS-1.1.1** Identify the responsibility to survey the hazardous materials incident to determine the containers and materials involved, whether hazardous materials have been released, and the surrounding conditions.
 - OPS-1.1.2** Identify the responsibility to collect hazard and response information from MSDS, CHEMTREC and shipper / manufacturer contacts.
 - OPS-1.1.3** Identify the responsibility to predict likely behavior of a material and its container.
 - OPS-1.1.4** Identify the responsibility to estimate the potential harm at a hazardous materials incident.
- OPS-1.2** Describe the responsibility to plan an initial response within the capabilities and competencies of available personnel, personal protective equipment, and control equipment, and demonstrate the ability to do the following:
- OPS-1.2.1** Identify the responsibility to describe the response objectives available for hazardous materials incidents.
 - OPS-1.2.2** Identify the responsibility to describe the defensive options available for a given response objective.
 - OPS-1.2.3** Identify the responsibility to determine whether the personal protective equipment provided is appropriate for implementing each defensive option.
 - OPS-1.2.4** Identify the responsibility to identify the emergency decontamination procedures.
- OPS-1.3** Describe the responsibility to implement the planned response to favorably change the outcomes consistent with the local emergency response plan and the organization's SOP's, and demonstrate the ability to do the following:
- OPS-1.3.1** Identify the responsibility to establish and enforce scene control procedures including control zones, emergency decontamination, and communications.
 - OPS-1.3.2** Identify the responsibility to initiate the Incident Management System (IMS) for hazardous materials incidents.
 - OPS-1.3.3** Identify the responsibility to don, work in and doff personal protective equipment provided by the authority having jurisdiction.
 - OPS-1.3.4** Identify the responsibility to perform defensive control functions identified in the action plan.
- OPS-1.4** Describe the responsibility to evaluate the progress of the actions taken to ensure that the response objectives are being met safely, effectively, and efficiently and demonstrate the ability to do the following:
- OPS-1.4.1** Identify the responsibility to evaluate the status of the defensive actions taken in accomplishing the response objectives.
 - OPS-1.4.2** Identify the responsibility to communicate the status of the planned response.

Analyzing the Incident: Surveying the Hazardous Materials Incident

- OPS-2** Given examples of both facility and transportation situations involving hazardous materials, survey the hazardous materials incident to determine the container materials involved, whether hazardous materials have been released, and the surrounding conditions. The survey should include the following:
- and
1. Inventory of the type of containers involved
 2. Container identification markings
 3. Container quantity or capacity
 4. Involved materials
 5. Release information
 6. Surrounding conditions.
- OPS-2.1** Given examples of various hazardous materials containers, identify the general shapes of containers for liquids, gases, and solid hazardous materials that are typically found.
- OPS-2.1.1** Given examples of the following tank cars, identify each tank car by type:
1. Nonpressure tank cars with and without expansion domes
 2. Pressure tank cars
 3. Cryogenic liquid tank cars
 4. Pneumatically unloaded hopper cars
 5. High-pressure tube cars.
- OPS-2.1.2** Given examples of the following intermodal tank containers, identify each intermodal tank container by type, identify one material and its USDOT Hazard Class that is typically found in each tank:
1. Nonpressure intermodal tank containers (IM-101 and IM 102)
 2. Pressure intermodal tank containers
 3. Special intermodal tanks (Cryogenic and tube modules).
- OPS-2.1.3** Given examples of the following cargo tank by type:
1. Nonpressure liquid tanks (MC-306)
 2. Low pressure chemical tanks (MC307)
 3. Corrosive liquid tanks (MC-312)
 4. High pressure tanks (MC-331)
 5. Cryogenic liquid tanks (MC-338)
 6. Dry bulk cargo tanks
 7. Compressed gas tube trailers.
- OPS-2.1.4** Given examples of the following facility tanks, identify at least one material and its hazard, that are typically found in each fixed facility tank by type:
1. Nonpressure tank
 2. Pressure tank
 3. Cryogenic liquid tank.
- OPS-2.1.5** Given examples of the following nonbulk packages, identify each package by type:
1. Bags
 2. Carboys
 3. Cylinders
 4. Drums.
- OPS-2.1.7** Given examples of various radioactive material containers, identify each container/package by type:
1. Type A Package

2. Type B Package
3. Industrial
4. Excepted
5. Strong, tight containers.

- OPS-2.2** Given examples of facility and transportation containers, identify the markings that differentiate one container from another.
- OPS-2.2.1** Given examples of the following marked transport vehicles and their corresponding shipping papers, identify the vehicle or tank identification marking:
1. Rail transportation vehicles, including tank cars
 2. Intermodal equipment including tank containers
 3. Highway transport vehicles, including cargo tanks.
- OPS-2.2.2** Given examples of the facility containers, identify the markings indicating container size, product contained and /or site identification numbers.
- OPS-2.3** Given examples of the facility and transportation scenario involving hazardous materials, identify the name(s) of the hazardous material(s) in each situation.
- OPS-2.3.1** Identify the following information on a pipeline marker:
1. Product
 2. Owner/operator
 3. Emergency telephone number.
- OPS-2.3.2** Given a pesticide label, identify each of the following pieces of information; then match the piece of information to its significance in surveying the hazardous material incident:
1. Name of pesticide
 2. Signal word
 3. Pest control product number
 4. Precautionary statement
 5. Hazard statement
 6. Active ingredient.
- OPS-2.3.3** Given a radioactive material label identify vertical bars, contents and activity and transport index.
- OPS-2.4** Identify and list surrounding conditions that should be noted when surveying hazardous materials incidents. Surrounding conditions may include:
1. The topography, land use, bodies of water and accessibility
 2. Weather conditions
 3. Public exposure potential, adjacent land use (rail lines, roadways, ports and airports)
 4. Utilities, pipelines, storm and sewer drains
 5. Ignition sources
 6. Nature and extent of injuries
 7. Building information such as floor drains, ventilation ducts and returns should be considered.
- OPS-2.5** Give examples of ways to verify information obtained from the surveying of a hazardous materials incident.
- OPS-2.6** Identify at least three additional hazards that could be associated with an incident involving criminal or terrorist activity. The following are some examples of hazards:
1. Secondary events intended to delay or incapacitate emergency responders

2. Armed resistance
3. Use of weapons
4. Booby traps
5. Secondary contamination from handling patients
6. Hostage barricade situations.

Analyzing the Incident: Collecting Hazard and Response Information

- OPS-3** Given known hazardous materials, collect hazard and response information from MSDS, CHEMTREC and contacts with the shipper/manufacturer.
- OPS-3.1** Match the definitions associated with the USDOT Hazard Classes and divisions of hazardous materials, including refrigerated gases and cryogenic liquids, with the class or division.
- OPS-3.2** Identify two ways to obtain a MSDS in an emergency.
- OPS-3.3** Using a MSDS for a specified material, identify the following hazard and response information:
1. Physical and chemical characteristics
 2. Physical hazards of the material
 3. Health hazards of the material
 4. Signs and symptoms of exposure
 5. Routes of entry
 6. Permissible exposure limits
 7. Responsible party contact
 8. Precautions for safe handling (including hygiene practices, protective measures, procedures for clean up of spills and leaks)
 9. Applicable control measures including personal protective equipment
 10. Emergency and first aid procedures.
- OPS-3.4** Identify the following:
1. The type of assistance provided by CHEMTREC
 2. How to contact CHEMTREC.
 3. The information to be furnished to CHEMTREC
- OPS-3.5** Identify two methods of contacting the manufacturer or shipper to obtain hazard and response information.
- OPS-3.6** Identify two type of assistance provided by local, state and federal authorities, with respect to criminal or terrorist activities involving hazardous materials.
- OPS-3.6.1** Identify the procedure for contacting local, state and federal authorities as specified in the local emergency response plan (ERP) or the organization's SOG.
- OPS-3.7** Describe the properties and characteristics of the following:
1. Alpha particles
 2. Beta particles
 3. Gamma rays
 4. Neutrons.

Analyzing the Incident: Predicting the Behavior of a Material and its Container

- OPS-4** Given examples of a single facility and transportation hazardous materials incidents, predict the likely behavior of a material and its container in each incident.

- OPS-4.1** Given situations involving known hazardous materials, interpret the hazard response information obtained from the current edition of the North American Emergency Response Guidebook, MSDS, CHEMTREC and shipper/manufacturer contacts.
- OPS-4.1.1** Match the following chemical and physical properties with their significance and impact on the behavior of the container and/or its contents:
- Boiling point
 - Chemical reactivity
 - Corrosivity (pH)
 - Flammable (explosive) range (LEL & UEL)
 - Flash point
 - Ignition (autoignition) temperature
 - Physical state (solid, liquid, gas)
 - Specific gravity
 - Toxic products of combustion
 - Vapor density
 - Vapor pressure
 - Water solubility
 - Radiation (ionizing and non-ionizing).
- OPS-4.1.2** Identify the differences among the following terms:
- Exposure and hazard Exposure and contamination
 - Contamination and secondary contamination
 - Radioactive material exposure
- OPS-4.2** Identify three types of stress that could cause a container system to release its contents.
- Mechanical stress
 - Thermal stress
 - Chemical stress.
- OPS-4.3** Identify five ways in which containers can breach.
- Punctures
 - Splits or tears
 - Closures opening up
 - Disintegration
 - Runaway cracking.
- OPS-4.4** Identify four ways in which containers can release their contents.
- Catastrophic release or rupture
 - Detonation
 - Rapid relief
 - Spills or leaks.
- OPS-4.5** Identify the general testing requirements for “Type A,” “Type B” and “Special Form” packaging used for radioactive materials transportations.
- OPS-4.6** Identify common “industrial radiography” sources and any specialized large quantity radioactive materials packages commonly transported through the local jurisdiction by their shapes and characteristics.
- OPS-4.7** Identify at least four dispersion patterns that can be created upon release of a hazardous material. The following are examples:
- Cloud or hemisphere
 - Plume

3. Cone
4. Stream or pooling
5. Irregular.

OPS-4.8 Identify the three general time frames for predicting the length of time that exposures may be in contact with the hazardous material in an endangered area to be

1. Short-term (minutes and hours)
2. Medium-term (days, weeks and months)
3. Long-term (years).

OPS-4.9 Identify the health and physical hazards that could cause harm to include;

1. Thermal
2. Etiologic
3. Asphyxiation
4. Mechanical
5. Corrosive
6. Poisonous
7. Radiation.

OPS-4.9.1 Identify the health hazards associated with the following terms:

1. Asphyxiant - cellular and pulmonary
2. Chronic health hazard
3. Convulsant
4. Irritants and corrosive
5. Sensitizer/allergen
6. Highly Toxic
7. Carcinogens
8. Infectious Agents.
9. Systemic toxins.
10. Mutagens
11. Teratogens
12. Alpha, beta gamma and neutron radiation.

OPS-4.10 Given the following types of warfare agents, identify the corresponding DOT hazard class and division:

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

Analyzing the Incident: Estimating the Potential Harm

OPS-5 Given simulated incidents involving hazardous materials, estimate the potential harm within the endangered area at a hazardous materials incident to include:

1. Determining the dimensions of the area
2. Estimating the number of exposures
3. Measuring or predicting concentrations of materials
4. Estimating the physical, health and safety hazards
5. Identifying the areas of potential harm
6. Estimating the potential outcomes.

- OPS-5.1** Identify a resource for determining the size of an endangered area surrounding conditions at a hazardous materials incident to include:
1. The current North America Emergency Response Guidebook
 2. Facility pre-incident plume dispersion modeling results.
- OPS-5.2** Given the dimensions of the endangered area and the surrounding conditions at a hazardous materials incident, estimate the number and type of exposures within that endangered area.
- OPS-5.3** Identify resources available for determining the concentrations of a released hazardous material within an endangered area.
- OPS-5.4** Identify the factors for determining the extent of physical, health, and safety hazards within the endangered area of a hazardous materials incident given the concentration of the released hazardous material.
1. Surrounding conditions
 2. Indication of the behavior of the hazardous material and its container
 3. Degree of hazard.
- OPS-5.5** Describe the impact that time, distance and shielding have on exposure to radioactive materials specific to the expected dose rate.
- OPS-5.6** Describe the prioritization of emergency medical care and removal of victims from the hazard area relative to exposure and contamination concerns.

Planning the Response: Describing Response Objectives for Hazardous Materials Incidents

- OPS-6** Given simulated facility and transportation hazardous materials problems, describe the first responder's response objectives for each problem.
- OPS-6.1** Identify the steps for determining the number of exposures that could be saved by the Firefighter with the resources provided by the authority having jurisdiction and operating in a defensive fashion, given an analysis of the hazardous materials problem, and the exposures already lost.
- OPS-6.2** Describe the steps for determining defensive response objective given an analysis of the hazardous materials incident.
- OPS-6.3** Describe how to assess the risk to response personnel for each hazard class in rescuing injured persons at a hazardous materials incident.

Planning the Response: Identifying Defensive Options

- OPS-7** Given simulated facility and transportation hazardous materials problems, identify the defensive options for each response objective.
- OPS-7.1** Identify the defensive options to accomplish a given response objective.
- OPS-7.2** Identify the purpose for, and the procedures, equipment, and safety precautions used with each of the following control techniques:
1. Absorption
 2. Dike, dam, diversion or retention
 3. Dilution
 4. Vapor dispersion

5. Vapor suppression
6. Remote valve shutoff.

Planning the Response: Determining Appropriateness of Personal Protective Equipment

- OPS-8** Given the name of a hazardous material involved and the anticipated type of exposure, determine whether available personal protective equipment is appropriate for implementing a defensive option.
- OPS-8.1** Identify the appropriate respiratory protection required for a given defensive option for the first responder at the operational level as positive pressure self-contained breathing apparatus.
- OPS-8.1.1** Identify the three types of respiratory protection and the advantages and limitations presented by the use of each at hazardous materials incidents.
- OPS-8.1.2** Identify the required physical capabilities and limitations of personnel working in positive pressure self-contained breathing apparatus.
- OPS-8.2** Identify the appropriate personal protective equipment required for a given defensive option.
- OPS-8.2.1** Identify skin contact hazards encountered at hazardous materials incidents.
- OPS-8.2.2** Identify the purpose, advantages, and limitations of the following protective clothing at hazardous materials incidents:
1. Structural fire fighting clothing
 2. High temperature protective clothing
 3. Chemical protective clothing
 4. Liquid splash protective clothing
 5. Vapor protective clothing.

Planning the Response: Identifying Emergency Decontamination Procedures

- OPS-9** Given a plan of action for a hazardous materials incident, identify emergency decontamination procedures.
- OPS-9.1** Identify ways that personnel, personal protective equipment, apparatus, and tools and equipment become contaminated.
- OPS-9.2** Describe how the potential for secondary contamination determines the need for emergency contamination procedures.
- OPS-9.3** Identify the purpose of emergency decontamination at hazardous materials incidents.
- OPS-9.4** Identify the advantages and limitations of emergency decontamination procedures.
- OPS-9.5** Identify appropriate, simple procedures for dealing with accident victims with life-threatening injuries who are known or suspected to be contaminated with radioactive material.
- OPS-9.6** Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's for decontamination of a large number of people exposed to hazardous materials

OPS-9.7 Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Implementing the Planned Response: Establishing and Enforcing Scene Control Procedures

OPS-10 Given scenarios for facility and/or transportation hazardous materials incidents identify how to establish and enforce scene control including control zones, emergency decontamination and communications.

OPS-10.1 Identify the procedures for establishing scene control through control zones.

OPS-10.2 Identify the criteria for determining the locations of the control zones at hazardous materials incidents.

OPS-10.3 Identify the basic techniques for the following protective actions at hazardous materials incidents:
1. Evacuation
2. Sheltering in-place.

OPS-10.4 Identify the considerations associated with locating emergency decontamination.

OPS-10.5 Demonstrate the ability to perform emergency decontamination.

OPS-10.6 Identify the items to be considered in a safety briefing prior to allowing personnel to work at the following:
1. Hazardous materials incident
2. Hazardous materials incident with criminal or terrorist activities.

OPS-10.6.1 Identify the items to be considered in a safety briefing prior to allowing for criminal or terrorist related incidents to include:
1. Secondary events intended to incapacitate or delay emergency responders
2. Armed resistance
3. Use of weapons
4. Booby traps
5. Secondary contamination from handling patients.

Implementing the Planned Response: Initiating the Incident Management System (IMS)

OPS-11 Given a simulated facility and/or transportation hazardous materials incidents, initiate the incident management system (IMS) specified in the local emergency response plan and the organizations SOP's.

OPS-11.1 Identify the role of the Firefighter at the operational level during hazardous materials incidents as specified in the local emergency response plan and the organizations SOP's.

OPS-11.2 Identify the levels of hazardous materials incidents as defined in the SERC Uniform Classification System for Categorizing Hazardous Materials Incidents:
1. Level 1 - Minor
2. Level 2 - Moderate
3. Level 3 – Major

OPS-11.3 Identify the purpose, need, benefits and elements of an IMS at hazardous materials incidents.

- OPS-11.4** Identify the considerations for determining the location of the command post for a hazardous materials incident.
- OPS-11.5** Identify the procedures for requesting additional resources at a hazardous materials incident.
- OPS-11.6** Identify the responsibilities of the safety officer as follows:
1. Obtains a briefing from the Incident Commander
 2. Advises the Incident Commander of incident safety considerations and dangerous situations
 3. Monitors the implementation of incident safety considerations
 4. Alters, suspends or terminates any activity that is deemed to be unsafe.

Implementing the Planned Response: Using Personal Protective Equipment

- OPS-12** Demonstrate the ability to don, work in and doff the personal protective equipment provided by the authority having jurisdiction.
- OPS-12.1** Identify the importance of the buddy system in implementing the planned defensive options.
- OPS-12.2** Identify the importance of the backup personnel in implementing the planned defensive actions.
- OPS-12.3** Identify the safety precautions to be observed when approaching and working at hazardous materials incidents.
- OPS-12.4** Identify the signs and symptoms of heat and cold stress.
- OPS-12.5** Identify the physical capabilities required for and the limitations of personnel working in the personal protective equipment as provided by the authority having jurisdiction.
- OPS-12.6** Match the function of the operational components of the positive pressure self-contained breathing apparatus provided the responders to the name of the component.
- OPS-12.7** Identify the procedures for cleaning, sanitizing and inspecting respiratory protective equipment.
- OPS-12.8** Identify the procedures for donning, working in and doffing positive pressure self-contained breathing apparatus.
- OPS-12.9** Demonstrate donning, working in and doffing positive pressure self-contained breathing apparatus. (Note: Firefighters should have extensive knowledge of the positive pressure self-contained breathing apparatus. This demonstration competency is to identify those individuals who may need additional training in the use of positive pressure SCBA.)

Implementing the Planned Response: Performing Defensive Control Actions

- OPS-13** Given a plan of action for a hazardous materials incident within their capabilities, demonstrate the ability to perform the defensive control actions set out in the plan.
- OPS-13.1** Understand the types of firefighting foam(s) or vapor suppressing agent(s) and foam equipment furnished by the authority having jurisdiction, understand the proper

application of the firefighting foam(s) or vapor-suppressing agents on a spill or fire involving hazardous materials.

- OPS-13.2** Identify the characteristics and applicability of the following types of foams:
1. Protein
 2. Fluoroprotein
 3. Special purpose
 - a. Polar solvent alcohol-resistant concentrates.
 - b. Hazardous materials concentrates
 4. Aqueous film-forming foam (AFFF)
 5. High expansion.
- OPS-13.3** Given the appropriate tools and equipment, describe how to perform the following defensive control activities:
1. Absorption
 2. Damming, diking, diversion, and retention
 3. Dilution
 4. Vapor dispersion
 5. Vapor suppression.
- OPS-13.4** Understand the location and use of the mechanical, hydraulic and air emergency remote shut-off devices.
- OPS-13.5** Describe the objectives and dangers of search and rescue missions at hazardous materials incidents.
- OPS-13.6** Describe methods for controlling the spread of radioactive contamination to the limit impact.
- OPS-13.7** Describe procedures, such as those listed in the Local Emergency Response Plan or the organization's SOP's, to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Evaluating Progress: Evaluation the Status of Defensive Actions

- OPS-14** evaluate objectives. Given simulated facility and/or transportation hazardous materials incidents, the status of the defensive actions taken in accomplishing the response
- OPS-14.1** Identify the considerations for evaluating whether defensive options are effective in accomplishing the objectives.
- OPS-14.2** Describe the circumstances under which it would be prudent to withdraw (pull back) from a hazardous materials incident.

Evaluating Progress: Communicating the Status of the Planned Response

- OPS-15** Given simulated facility and/or transportation hazardous materials incidents, demonstrate communicating the status of the planned response to the incident commander through the normal chain of command.

- OPS-15.1** Identify the methods for communicating the status of the planned response to the incident commander through the normal chain of command.
- OPS-15.2** Identify the methods for immediate notification of the incident commander and other response personnel about critical emergency conditions at the incident.

Summary: Firefighter Operations Level

Audience

Large training audience. All Firefighters who may participate in operations at a hazardous materials incident.

Prerequisites

First Responder Awareness Level.

Training

Classroom and simulated lab/field instruction. Competencies include: (1) understanding hazardous material terms, basic hazard and risk assessment, and the role of the Firefighter at the operational level. (2) Ability to perform basic control, containment and/or confinement techniques with proper use of personal protective equipment and following standard operating procedures (SOP's). (3) Ability to implement basic decontamination procedures.

Refresher Training

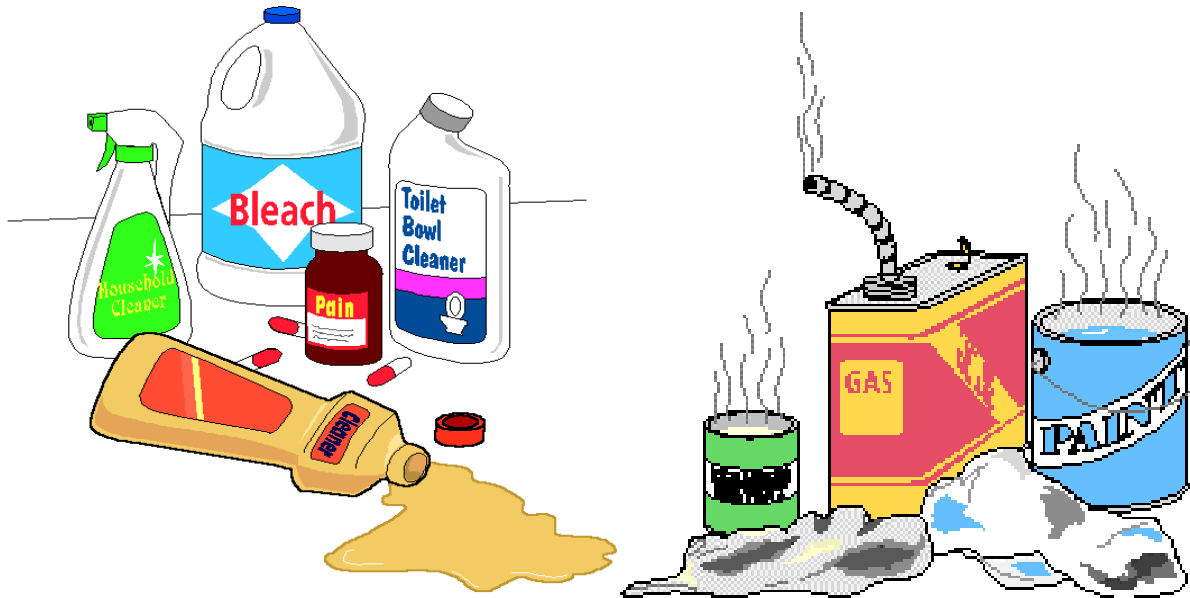
To occur annually:

1. Competency retesting of all response skills.
2. Technical information updates.
3. Incident scene decision-making using simulated emergencies.

FLORIDA STATE EMERGENCY RESPONSE COMMISSION

Guidelines for Public Works, Utilities, Transportation, Public Health and General Employees Hazardous Materials Training

October 1, 2002
~Revised~



Guidelines for Public Works, Utilities, Transportation, Public Health and General Employees Hazardous Materials Training

Introduction

Employees not addressed specifically by the Florida State Emergency Response Commission shall be trained to meet the competencies of the awareness level. In certain cases, when the local emergency response plan defines emergency response roles beyond the scope of the awareness level, it will be necessary to train the individual to the level appropriate for the defined emergency response role. Both the awareness and operational competencies are defined below. Should the defined emergency response role call for a competency in the operational level competencies, then the individual will be trained to the operational level. All employees with a defined emergency response role in the local emergency response plan will be trained to the appropriate level, awareness as a minimum, utilizing approved programs meeting the competencies outlined below.

Employees expected to operate at the technician level at a hazardous materials incident as defined in the local emergency response plan will be trained to the competencies defined for Technicians in the Guidelines for Hazardous Materials Training as published by the Florida State Emergency Response Commission. In addition, Employees shall receive training to meet requirements of the Occupational Safety and Health Administration (OSHA), Florida Department of Environmental Protection, and the US. Environmental Protection Agency (EPA) as appropriate for their jurisdictions. Other employees that respond or can be expected to respond to a hazardous materials incident must be knowledgeable of 29 CFR 1910.120 and 40 CFR 311 training and emergency response requirements.

First Responder Awareness Level

Definition

Employees at the awareness level are personnel who are likely to discover or witness a hazardous materials emergency, or in the normal course of their duties may be the first on the scene of an emergency involving hazardous materials. Employees at the awareness level are expected to recognize hazardous materials are present, protect themselves, call for trained personnel and secure the area. The most important duty of these personnel is to make proper notification in order to begin the emergency response sequence. This level of training anticipates a response role, which involves no potential for exposure to the hazards related to the hazardous materials involved in an incident.

Audience

Employees such as public works, utilities, emergency management, transportation, public health, etc.. The audience is a large and diverse group, although the minimum competencies remain the same, whenever possible training should be tailored to meet the needs of specific groups. Students from a specific discipline should be asked to respond to scenarios relevant to their work and play roles that are consistent with their defined emergency response roles and occupational responsibilities.

Related Health and Safety Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)

EPA 40 CFR 311 Worker Protection

NETC, Guidelines for Public Sector Hazardous Materials Training (March 1998)

Appropriate Methodologies

First Responder Awareness training should be conducted using a mix of lecture and media presentations with individual and small group exercises. The exercises should consist of activities practicing identification and recognition of hazardous materials from scenario descriptions and using information

sources such as the North American Emergency Response Guidebook to establish the presence of hazardous materials in the scenarios. Competency should be measured by written examination.

Refresher training occurring annually should focus on skill renewal in using information sources to recognize and identify hazardous materials.

The SERC estimates that the training outlined above for the awareness level can be accomplished in approximately 8 contact hours with competent instructors knowledgeable in hazardous materials response. Annual refresher should be accomplished with approximately 4 contact hours of training. Certificates should be issued for successful demonstration of competency for initial and refresher hazardous materials training.

Training

Employers are required to ensure that Employees demonstrate competency in the skills required. All Employees will be trained to the appropriate level utilizing the Florida First Responder Awareness Level Hazardous Materials Training Program, National Fire Academy Program - Initial Response to Hazardous Materials Incidents: Basic Concepts or similar curricula complying with the competencies First Responder Awareness as defined in 29 CFR 1910.120 *and* NFPA 472.

Employees with a defined emergency response role will be trained to meet all the following competencies of the awareness level as a minimum. The first responder awareness level competencies are defined below:

The following training objectives are recommended for first responder awareness level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

First Responder Awareness

Recommended Training Objectives

- AWARE-1** Given a hazardous materials incident scenario, demonstrate an understanding of the role of the responder at the awareness level.
- AWARE-1.1** Describe the responsibility to analyze the incident to determine the hazardous materials present and the basic hazard and response information for each type of hazardous material, and demonstrate the ability to do the following:
 - AWARE-1.1.1** Identify the responsibility to detect the presence of hazardous materials.
 - AWARE-1.1.2** Identify the responsibilities to survey a hazardous materials incident, from a safe location, to identify the name, UN/NA identification number or type placard applied for any hazardous material involved.
 - AWARE-1.1.3** Identify the responsibility to collect hazard information from the current edition of the *North American Emergency Response Guidebook* (ERG).
- AWARE-1.2** Describe the responsibility to implement actions consistent with the local emergency response plan, the organization's SOP's and the current edition of the *North American Emergency Response Guidebook*, and demonstrate the ability to do the following:
 - AWARE-1.2.1** Identify the responsibility to initiate protective actions consistent with the local emergency response plan, the organization's SOP's, and the current edition of the *North American Emergency Response Guidebook*.

AWARE-1.2.2 Identify the responsibility to initiate the notification process specified in the local emergency response plan and the organization's SOP's.

Analyzing the Incident - Detecting the Presence of Hazardous Materials

AWARE-2 Given incident scenarios involving facility and/or transportation situations with and without hazardous materials present, identify those situations where hazardous materials are present.

AWARE-2.1 Identify the definition of hazardous materials.

AWARE-2.2 Identify the USDOT Hazard Classes and divisions of hazardous materials and identify common examples of each hazard class or division.

AWARE-2.3 Identify the primary hazards associated with each of the USDOT Hazard Classes and divisions of hazardous materials by hazard class or division.

AWARE-2.4 Identify the difference between hazardous materials emergencies and other emergencies.

AWARE-2.5 Identify typical occupancies and locations in the community where hazardous materials are manufactured, stored, transported, used or disposed of.

AWARE-2.6 Identify typical container shapes that may indicate hazardous materials.

AWARE-2.7 Identify facility and transportation markings and colors that indicate hazardous materials, including:

1. UN/NA identification number
2. NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, markings
3. Military hazardous materials markings
4. Special hazard communication markings
5. Pipeline marker
6. Container markings.

AWARE-2.8 Given an NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response marking, identify the significance of the colors, numbers and special symbols.

AWARE-2.9 Identify US and Canadian placards and labels that indicate hazardous materials.

AWARE-2.10 Identify the basic information on material safety data sheets (MSDS) and shipping papers that indicate hazardous materials.

AWARE-2.10.1 Identify where to find material safety data sheets (MSDS).

AWARE-2.10.2 Identify entries on a material safety data sheet that indicate the presence of hazardous materials.

AWARE-2.10.3 Identify the entries on shipping papers that indicate the presence of hazardous materials.

AWARE-2.10.4 Match the name of the shipping papers found in transportation (air, highway, rail and water).

- AWARE-2.10.5** Identify the person responsible for having the shipping papers in each mode of transportation.
- AWARE-2.10.6** Identify where the shipping papers are found in each mode of transportation.
- AWARE-2.10.7** Identify where the papers can be found in an emergency in each mode of transportation.
- AWARE-2.11** Identify examples of clues (other than occupancy/location, container shape, markings/color, placards/labels, and shipping papers) that use the senses of sight, sound and odor to indicate the presence of hazardous materials:
1. Changes in pressure release
 2. Presence of smoke and/or fire
 3. Presence of liquids, gas leaks, or vapor cloud
 4. Chemical reactions
 5. Condensation lines
 6. Mass Casualties.
- AWARE-2.12** Describe the limitations of using the senses in determining the presence or absence of hazardous materials.
- AWARE-2.13** Identify types of locations that may become targets for criminal or terrorist activity using hazardous materials. The following are some examples of locations:
1. Public assembly areas
 2. Public/Government buildings
 3. Mass transit systems
 4. Places with high economic impact
 5. Telecommunications facilities
 6. Places with historical or symbolic significance
 7. Military facilities
 8. Airports, Train Stations and Ports
 9. Industrial facilities.
- AWARE-2.14** Identify at least four indicators of possible criminal or terrorist activity involving hazardous materials.
The following are some examples of indicators:
1. Hazardous materials or lab equipment that is not relevant to the occupancy
 2. Intentional release or hazardous materials
 3. Unexplained patterns of sudden onset illnesses or deaths
 4. Unusual orders or tastes
 5. Mass casualty incident with unexplained signs of skin, eye or airway irritation
 6. Unusual security, locks, bars on windows, covered windows and barbed wire
 7. Unexplained vapors clouds, mists and plumes
 8. Patients twitching, tightness in chest, sweating, pin-point pupils (miosos), runny nose (rhinorrhea) and nausea and vomiting.
 9. Unusual presence of natural indicator such as sick or dead birds and animals or dead or discolored trees, shrubs or grass.
- AWARE-2.15** Describe the difference between a chemical and a biological incident.
1. Chemical incident are identified by the rapid onset of medical signs and symptoms characteristic of chemical exposure. Natural indicators and obvious signs of release may be present such as chemical residue and odors.
 2. Biological incident are gradual in onset of medical signs and symptoms with no obvious characteristic of odor or colors. The migration of the disease by infected individuals may be widespread and transmission from one person to another may occur.

- AWARE-2.16** Identify at least four indicators of possible criminal or terrorist activity involving biological agents. The following are some examples of indicators:
1. Mass causality incident with unusual number of ill or dying persons with common signs and symptoms.
 2. Hospitals reporting mass casualties with similar signs and symptoms.
 3. Unscheduled outdoors spraying
 4. Abandoned spraying (dissemination) device.

Analyzing the Incident: Surveying the Hazardous Materials Incident from a Safe Location

- AWARE-3** Given simulated facility and transportation incidents involving hazardous materials, identify the hazardous material(s) in each situation by name, UN/NA identification number and/or type placard applied.
- AWARE-3.1** Identify difficulties encountered in determining the specific names of hazardous materials in both facilities and transportation.
- AWARE-3.2** Identify the significance of the terms “Type A”, “Type B” and “Special Form” as they relate to radioactive materials packaging.
- AWARE-3.3** Identify additional information concerning radionuclide identity and activity provided on radioactive material labels and shipping papers.
- AWARE-3.4** Identify additional information concerning physical and chemical form and packaging type provided on radioactive materials shipping papers.
- AWARE-3.5** Identify sources for obtaining the names of, UN/NA identification numbers for or type of placards associated with hazardous materials in transportation.
- AWARE-3.6** Identify sources for obtaining the names of hazardous materials in a facility.

Analyzing the Incident: Collecting Hazard Information

- AWARE-4** Given the identity of various hazardous materials (name, UN/NA number or type placard), identify the fire, explosion, and health hazard information for each material using the current edition of the *North American Emergency Response Guidebook*.
- AWARE-4.1** Identify the way hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- AWARE-4.2** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-4.3** Given the current edition of the *North American Emergency Response Guidebook*, identify the three methods for determining the appropriate guide page for a specific hazardous material.
- AWARE-4.4** Given the current edition of the *North American Emergency Response Guidebook*, identify the two general types of hazards found on each guide page.
- AWARE-4.5** Identify the difficulties encountered in using the senses to recognize radioactive material releases and radiation exposure.

Analyzing the Incident – Initiating Protective Actions

- AWARE-5** Given simulated facility and transportation hazardous materials incidents, identify the actions to be taken to protect themselves and others and to control access to the scene using the local emergency response plan, the organization's SOP's or the current edition of the *North American Emergency Response Guidebook*.
- AWARE-5.1** Identify the location of both the local emergency response plan and the organization's SOP's.
- AWARE-5.2** Given the local emergency response plan or the organization's SOP's, identify the role of the first responder at the awareness level during a hazardous material incident.
- AWARE-5.2.1** Given a simulated facility and/or transportation hazardous materials incidents, initiate the Incident Management System (IMS) specified in the local emergency response plan and the organizations SOP's.
- AWARE-5.2.2** Identify the basic techniques for the following protective actions at hazardous materials incidents.
1. Evacuation
 2. In-place protection.
- AWARE-5.3** Given the local emergency response plan or the organization's SOP's, identify the basic precautions to be taken to protect themselves and others in a hazardous materials incident.
- AWARE-5.3.1** Identify circumstances involving radioactive material in transportation where actions should be initiated to protect the lives of accident victims through carrying out rescue and providing emergency medical care.
- AWARE-5.3.2** Identify the precautions necessary when providing emergency medical care to victims of hazardous materials incidents.
- AWARE-5.3.3** Identify typical ignition sources found at scenes of hazardous materials incidents.
- AWARE-5.3.4** Identify the ways hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- AWARE-5.3.5** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-5.4** Given the identity of various hazardous materials (name, UN/NA identification number or type placard), identify the following response information using the current edition of the *North American Emergency Response Guidebook*.
- a. Emergency Action (fire, spill, leak and first aid)
 - b. Personal protective equipment necessary
 - c. Initial isolation and protective action distances.
- AWARE-5.4.1** Given the name of a hazardous material identify the recommended personal protective equipment from the following list:
1. Street clothing and work uniforms
 2. Structural fire-fighting protective clothing
 3. Positive pressure self-contained breathing apparatus (SCBA)

4. Chemical-protective clothing and equipment.

AWARE-5.4.2 Identify the definitions for each of the following protective actions:

1. Isolation of the hazard area and denial of entry
2. Evacuation
3. Sheltering in-place protection.

AWARE-5.4.3 Identify the shapes of recommended initial isolation and protective action zones.

AWARE-5.4.4 Describe the difference between small and large spills as found in the table of Initial Isolation and Protective Actions Distances.

AWARE-5.4.5 Identifying the circumstances under which the following distances are used at a hazardous materials incident:

1. Table of initial isolation and protective action distances
2. Isolation distances in the numbered guides.

AWARE-5.4.6 Given a copy of the current edition of the *North American Emergency Response Guidebook*, describe the difference between the isolation distances in the orange-bordered guide pages and the protective action distances in the green-bordered pages in the document.

AWARE-5.5 Identify the techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials incidents.

AWARE-5.6 Identify the specific actions necessary when an incident is suspected to involve criminal or terrorist activity. The following are some examples:

1. Take self protective actions
2. Be alert to secondary devices
3. Communicate the suspicion during the notification process
4. Establish work control zones and access control points
5. Isolate potentially exposed people
6. Document the initial observation
7. Prevent secondary contamination
8. Attempt to preserve evidence while performing operational duties

Implementing the Response – Initiating the Notification Process

AWARE-6 Given either a facility or transportation scenario of hazardous materials incidents, with and without criminal or terrorist activities, identify the appropriate notifications to be made and how to make them, consistent with the local emergency response plan or the organization's SOP's.

AWARE-6.1 Identify the initial notification procedures for hazardous materials incidents in the local emergency response plan or the organization's SOP's.

Summary: First Responder Awareness Level

Audience

Very broad, all employees who may respond to a hazardous materials incident.

Prerequisites

None.

Training

Traditional classroom delivery, Competencies include understanding hazardous materials incidents and the defined emergency response role of the individual public sector employee and the ability to recognize and identify that an incident is a hazardous materials incident.

Refresher

To occur annually;

1. Technical updates
2. Emergency response plan and SOG review
3. Ability to perform Awareness level competencies

First Responder Operational Level

Definition

Employees at the operational level are personnel who respond to releases or potential releases, as part of the initial response to protect people, property, and the environment from the effects of a hazardous materials emergency. Operational level Employees are trained to take defensive actions rather than stop the release. Their function is to contain the release from a safe distance, keep it from spreading and prevent exposures. Employees at the operational level must have knowledge of the awareness level. The awareness level competencies are included in this document. It must be understood that the operational level builds upon the knowledge obtained during awareness level training.

Audience

All Employees who may be called upon to respond to a hazardous materials incident. Employees at the operational level are typically those persons who are generally not members of a hazardous materials response team.

Related Health and Safety Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)

EPA 40 CFR 311 Worker Protection

NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents.

2002 Edition

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

2002 Edition

NETC, Guidelines for Public Sector Hazardous Materials Training (March 1998)

Appropriate Methodologies

Employee operational level training is best conducted in a classroom environment with opportunities for small and large group exercises either in classroom or field exercise in conjunction with the training. Training awareness level in conjunction with operational level is acceptable. Lectures with small group activities are appropriate instructional delivery of much of the material. However, incident scene organization and command drill and practice will require large group simulated incidents which are best conducted in a simulator or as a field exercise. Competency demonstration is absolutely imperative.

Refresher training occurring annually, should include: (1) competency retesting of all response skills, (2) technical information updates, and (3) critique of incident scene decision-making using simulated emergencies.

The SERC that the training outlined above can be accomplished in approximately 16 contact hours with competent instructors knowledgeable in hazardous materials response and personnel previously trained to the awareness level. Approximately 24 contact hours for new/recruit and previously untrained Employees is recommended. Annual refresher should be accomplished with approximately 8 contact hours of training. Certificates should be issued for successful demonstration of competency for both initial and refresher hazardous materials training.

The following training objectives are recommended for first responder operational level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

First Responder Operational Level

Recommended Training Objectives

- OPS-1** Given a hazardous materials incident scenario, demonstrate an understanding of the First Responder at the operations level.
- OPS-1.1** Describe the responsibility to analyze the hazardous materials incident and determine the magnitude of the problem in terms of outcomes, and demonstrate the ability to do the following:
- OPS-1.1.1** Identify the responsibility to survey the hazardous materials incident to determine the containers and materials involved, whether hazardous materials have been released, and the surrounding conditions.
- OPS-1.1.2** Identify the responsibility to collect hazard and response information from MSDS, CHEMTREC and shipper / manufacturer contacts.
- OPS-1.1.3** Identify the responsibility to predict likely behavior of a material and its container.
- OPS-1.1.4** Identify the responsibility to estimate the potential harm at a hazardous materials incident.
- OPS-1.2** Describe the responsibility to plan an initial response within the capabilities and competencies of available personnel, personal protective equipment, and control equipment and demonstrate the ability to do the following:
- OPS-1.2.1** Identify the responsibility to describe the response objectives available for hazardous materials incidents.
- OPS-1.2.2** Identify the responsibility to describe the defensive options available for a given response objective.
- OPS-1.2.3** Identify the responsibility to determine whether the personal protective equipment provided is appropriate for implementing each defensive option.
- OPS-1.2.4** Identify the responsibility to identify the emergency decontamination procedures.
- OPS-1.3** Describe the responsibility to implement the planned response to favorably change the outcomes consistent with the local emergency response plan and the organization's SOP's, and demonstrate the ability to do the following:
- OPS-1.3.1** Identify the responsibility to establish and enforce scene control procedures including control zones, emergency decontamination and communications.
- OPS-1.3.2** Identify the responsibility to initiate the Incident Management System (IMS) for hazardous materials incidents.
- OPS-1.3.3** Identify the responsibility to don, work in and doff personal protective equipment provided by the authority having jurisdiction.
- OPS-1.3.4** Identify the responsibility to perform defensive control functions identified in the action plan.

OPS-1.4 Describe the responsibility to evaluate the progress of the actions taken to ensure that the response objectives are being met safely, effectively, and efficiently and demonstrate the ability to do the following:

OPS-1.4.1 Identify the responsibility to evaluate the status of the defensive actions taken in accomplishing the response objectives.

OPS-1.4.2 Identify the responsibility to communicate the status of the planned response.

Analyzing the Incident: Surveying the Hazardous Materials Incident

OPS-2 Given examples of both facility and transportation situations involving hazardous materials, survey the hazardous materials incident to determine the container materials involved, whether hazardous materials have been released, and the surrounding conditions. The survey should include the following:

1. Inventory of the type of containers involved
2. Container identification markings
3. Container quantity or capacity
4. Involved materials
5. Release information
6. Surrounding conditions.

OPS-2.1 Given examples of various hazardous materials containers, identify the general shapes of containers for liquids, gases and solid hazardous materials that are typically found.

OPS-2.1.1 Given examples of the following tank cars, identify each tank car by type:

1. Nonpressure tank cars with and without expansion domes
2. Pressure tank cars
3. Cryogenic liquid tank cars
4. Pneumatically unloaded hopper cars
5. High-pressure tube cars.

OPS-2.1.2 Given examples of the following intermodal tank containers, identify each intermodal tank container by type, identify one material and its USDOT Hazard Class that is typically found in each tank:

1. Nonpressure intermodal tank containers (IM-101 and IM 102)
2. Pressure intermodal tank containers
3. Special intermodal tanks (Cryogenic and tube modules).

OPS-2.1.3 Given examples of the following cargo tank by type:

1. Nonpressure liquid tanks (MC-306)
2. Low pressure chemical tanks (MC307)
3. Corrosive liquid tanks (MC-312)
4. High pressure tanks (MC-331)
5. Cryogenic liquid tanks (MC-338)
6. Dry bulk cargo tanks
7. Compressed gas tube trailers.

OPS-2.1.4 Given examples of the following facility tanks, identify at least one material and its hazard, that are typically found in each fixed facility tank by type:

1. Nonpressure tank
2. Pressure tank
3. Cryogenic liquid tank.

- OPS-2.1.5** Given examples of the following nonbulk packages, identify each package by type:
1. Bags
 2. Carboys
 3. Cylinders
 4. Drums.
- OPS-2.1.7** Given examples of various radioactive material containers, identify each container/package by type:
1. Type A Package
 2. Type B Package
 3. Industrial
 4. Excepted
 5. Strong, tight containers.
- OPS-2.2** Given examples of facility and transportation containers, identify the markings that differentiate one container from another.
- OPS-2.2.1** Given examples of the following marked transport vehicles and their corresponding shipping papers, identify the vehicle or tank identification marking: Rail transportation vehicles, including tank cars:
1. Intermodal equipment including tank containers
 2. Highway transport vehicles, including cargo tanks.
- OPS-2.2.2** Given examples of the facility containers, identify the markings indicating container size, product contained and /or site identification numbers.
- OPS-2.3** Given examples of the facility and transportation scenario involving hazardous materials, identify the name(s) of the hazardous material(s) in each situation.
- OPS-2.3.1** Identify the following information on a pipeline marker:
1. Product
 2. Owner/operator
 3. Emergency telephone number.
- OPS-2.3.2** Given a pesticide label, identify each of the following pieces of information; then match the piece of information to its significance in surveying the hazardous material incident:
1. Name of pesticide
 2. Signal word
 3. Pest control product number
 4. Precautionary statement
 5. Hazard statement
 6. Active ingredient.
- OPS-2.3.3** Given a radioactive material label identify vertical bars, contents and activity and transport index.
- OPS-2.4** Identify and list surrounding conditions that should be noted when surveying hazardous materials incidents. Surrounding conditions may include:
1. The topography, land use, bodies of water and accessibility
 2. Weather conditions
 3. Public exposure potential, adjacent land use (rail lines, roadways, ports and airports)
 4. Utilities, pipelines, storm and sewer drains
 5. Ignitions sources
 6. Nature and extent of injuries

7. Building information such as floor drains, ventilation ducts and returns should be considered.

OPS-2.5 Give examples of ways to verify information obtained from the surveying of a hazardous materials incident.

OPS-2.6 Identify at least three additional hazards that could be associated with an incident involving criminal or terrorist activity. The following are some examples of hazards:

1. Secondary events intended to delay or incapacitate emergency responders
2. Armed resistance
3. Use of weapons
4. Booby traps
5. Secondary contamination from handling patients
6. Hostage barricade situations.

Analyzing the Incident: Collecting Hazard and Response Information

OPS-3 Given known hazardous materials, collect hazard and response information from MSDS, CHEMTREC and contacts with the shipper/manufacturer.

OPS-3.1 Match the definitions associated with the USDOT Hazard Classes and divisions of hazardous materials, including refrigerated gases and cryogenic liquids, with the class or division.

OPS-3.2 Identify two ways to obtain a MSDS in an emergency.

OPS-3.3 Using a MSDS for a specified material, identify the following hazard and response information:

1. Physical and chemical characteristics
2. Physical hazards of the material
3. Health hazards of the material
4. Signs and symptoms of exposure
5. Routes of entry
6. Permissible exposure limits
7. Responsible party contact
8. Precautions for safe handling (including hygiene practices, protective measures, procedures for clean up of spills and leaks)
9. Applicable control measures including personal protective equipment
10. Emergency and first aid procedures.

OPS-3.4 Identify the following:
a. The type of assistance provided by CHEMTREC.
b. How to contact CHEMTREC.
c. The information to be furnished to CHEMTREC.

OPS-3.5 Identify two methods of contacting the manufacturer or shipper to obtain hazard and response information.

OPS-3.6 Identify two type of assistance provided by local, state and federal authorities, with respect to criminal or terrorist activities involving hazardous materials.

OPS-3.6.1 Identify the procedure for contacting local, state and federal authorities as specified in the local emergency response plan (ERP) or the organization's SOG.

OPS-3.7 Describe the properties and characteristics of the following:
1. Alpha particles

2. Beta particles
3. Gamma rays
4. Neutrons.

Analyzing the Incident: Predicting the Behavior of a Material and its Container

- OPS-4** Given examples of a single facility and transportation hazardous materials incidents, predict the likely behavior of a material and its container in each incident.
- OPS-4.1** Given situations involving known hazardous materials, interpret the hazard response information obtained from the current edition of the North American Emergency Response Guidebook, MSDS, CHEMTREC and shipper/manufacturer contacts.
- OPS-4.1.1** Match the following chemical and physical properties with their significance and impact on the behavior of the container and/or its contents:
1. Boiling point
 2. Chemical reactivity
 3. Corrosivity (pH)
 4. Flammable (explosive) range (LEL & UEL)
 5. Flash point
 6. Ignition (autoignition) temperature
 7. Physical state (solid, liquid, gas)
 8. Specific gravity
 9. Toxic products of combustion
 10. Vapor density
 11. Vapor pressure
 12. Water solubility
 13. Radiation (ionizing and non-ionizing).
- OPS-4.1.2** Identify the differences among the following terms:
1. Exposure and hazard
 2. Exposure and contamination
 3. Contamination and secondary contamination
 4. Radioactive material exposure.
- OPS-4.2** Identify three types of stress that could cause a container system to release its contents:
1. Mechanical stress
 2. Thermal stress
 3. Chemical stress.
- OPS-4.3** Identify five ways in which containers can breach:
1. Punctures
 2. Splits or tears
 3. Closures opening up
 4. Disintegration
 5. Runaway cracking.
- OPS-4.4** Identify four ways in which containers can release their contents:
1. Catastrophic release or rupture
 2. Detonation
 3. Rapid relief
 4. Spills or leaks.
- OPS-4.5** Identify the general testing requirements for "Type A," "Type B" and "Special Form" packaging used for radioactive materials transportations.

- OPS-4.6** Identify common “industrial radiography” sources and any specialized large quantity radioactive materials packages commonly transported through the local jurisdiction by their shapes and characteristics.
- OPS-4.7** Identify at least four dispersion patterns that can be created upon release of a hazardous material. The following are examples:
1. Cloud or hemisphere
 2. Plume
 3. Cone
 4. Stream or pooling
 5. Irregular.
- OPS-4.8** Identify the three general time frames for predicting the length of time that exposures may be in contact with the hazardous material in an endangered area to be:
1. Short-term (minutes and hours)
 2. Medium-term (days, weeks and months)
 3. Long-term (years).
- OPS-4.9** Identify the health and physical hazards that could cause harm to include;
1. Thermal
 2. Etiologic
 3. Asphyxiation
 4. Mechanical
 5. Corrosive
 6. Poisonous
 7. Radiation.
- OPS-4.9.1** Identify the health hazards associated with the following terms:
1. Asphyxiant - cellular and pulmonary
 2. Chronic health hazard
 3. Convulsant
 4. Irritants and corrosive
 5. Sensitizer/allergen
 6. Highly Toxic
 7. Carcinogens
 8. Infectious Agents.
 9. Systemic toxins.
 10. Mutagens
 11. Teratogens
 12. Alpha, beta gamma and neutron radiation.
- OPS-4.10** Given the following types of warfare agents, identify the corresponding DOT hazard class and division:
1. Nerve agents
 2. Vesicants (blister agents)
 3. Blood agents
 4. Choking agents
 5. Irritants (riot control agents)
 6. Biological agents and toxins.

Analyzing the Incident: Estimating the Potential Harm

- OPS-5** Given simulated incidents involving hazardous materials, estimate the potential harm within the endangered area at a hazardous materials incident to include:
1. Determining the dimensions of the area

2. Estimating the number of exposures
3. Measuring or predicting concentrations of materials
4. Estimating the physical, health and safety hazards
5. Identifying the areas of potential harm
6. Estimating the potential outcomes.

OPS-5.1 Identify a resource for determining the size of an endangered area surrounding conditions at a hazardous materials incident to include:

1. The current North America Emergency Response Guidebook
2. Facility pre-incident plume dispersion modeling results.

OPS-5.2 Given the dimensions of the endangered area and the surrounding conditions at a hazardous materials incident, estimate the number and type of exposures within that endangered area.

OPS-5.3 Identify resources available for determining the concentrations of a released hazardous material within an endangered area.

OPS-5.4 Identify the factors for determining the extent of physical, health, and safety hazards within the endangered area of a hazardous materials incident given the concentration of the released hazardous material.

1. Surrounding conditions
2. Indication of the behavior of the hazardous material and its container
3. Degree of hazard.

OPS-5.5 Describe the impact that time, distance and shielding have on exposure to radioactive materials specific to the expected dose rate.

OPS-5.6 Describe the prioritization of emergency medical care and removal of victims from the hazard area relative to exposure and contamination concerns.

Planning the Response: Describing Response Objectives for Hazardous Materials Incidents

OPS-6 Given simulated facility and transportation hazardous materials problems, describe the first responder's response objectives for each problem.

OPS-6.1 Identify the steps for determining the number of exposures that could be saved by the responder with the resources provided by the authority having jurisdiction and operating in a defensive fashion, given an analysis of the hazardous materials problem, and the exposures already lost.

OPS-6.2 Describe the steps for determining defensive response objective given an analysis of the hazardous materials incident.

OPS-6.3 Describe how to assess the risk to response personnel for each hazard class in rescuing injured persons at a hazardous materials incident.

Planning the Response: Identifying Defensive Options

OPS-7 Given simulated facility and transportation hazardous materials problems, identify the defensive options for each response objective.

OPS-7.1 Identify the defensive options to accomplish a given response objective.

OPS-7.2 Identify the purpose for, and the procedures, equipment, and safety precautions used with each of the following control techniques:

1. Absorption
2. Dike, dam, diversion or retention
3. Dilution
4. Vapor dispersion
5. Vapor suppression
6. Remote valve shutoff.

Planning the Response: Determining Appropriateness of Personal Protective Equipment

- OPS-8** Given the name of a hazardous material involved and the anticipated type of exposure, determine whether available personal protective equipment is appropriate for implementing a defensive option.
- OPS-8.1** Identify the appropriate respiratory protection required for a given defensive option for the first responder at the operational level is positive pressure self-contained breathing apparatus.
- OPS-8.1.1** Identify the three type of respiratory protection and the advantages and limitations presented by the use of each at hazardous materials incidents.
- OPS-8.1.2** Identify the required physical capabilities and limitations of personnel working in positive pressure self-contained breathing apparatus.
- OPS-8.2** Identify the appropriate personal protective equipment required for a given defensive option.
- OPS-8.2.1** Identify skin contact hazards encountered at hazardous materials incidents.
- OPS-8.2.2** Identify the purpose, advantages, and limitations of the following protective clothing at hazardous materials incidents:
1. Structural firefighting clothing
 2. High temperature protective clothing
 3. Chemical protective clothing
 4. Liquid splash protective clothing
 5. Vapor protective clothing.

Planning the Response: Identifying Emergency Decontamination Procedures

- OPS-9** Given a plan of action for a hazardous materials incident, identify emergency decontamination procedures.
- OPS-9.1** Identify ways that personnel, personal protective equipment, apparatus and tools and equipment become contaminated.
- OPS-9.2** Describe how the potential for secondary contamination determines the need for emergency contamination procedures.
- OPS-9.3** Identify the purpose of emergency decontamination at hazardous materials incidents.
- OPS-9.4** Identify the advantages and limitations of emergency decontamination procedures.
- OPS-9.5** Identify appropriate, simple procedures for dealing with accident victims with life-threatening injuries who are known or suspected to be contaminated with radioactive material.

- OPS-9.6** Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's for decontamination of a large number of people exposed to hazardous materials
- OPS-9.7** Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Implementing the Planned Response: Establishing and Enforcing Scene Control Procedures

- OPS-10** Given scenarios for facility and/or transportation hazardous materials incidents identify how to establish and enforce scene control including control zones, emergency decontamination and communications.
- OPS-10.1** Identify the procedures for establishing scene control through control zones.
- OPS-10.2** Identify the criteria for determining the locations of the control zones at hazardous materials incidents.
- OPS-10.3** Identify the basic techniques for the following protective actions at hazardous materials incidents:
 1. Evacuation
 2. Sheltering in-place .
- OPS-10.4** Identify the considerations associated with locating emergency decontamination.
- OPS-10.5** Demonstrate the ability to perform emergency decontamination.
- OPS-10.6** Identify the items to be considered in a safety briefing prior to allowing personnel to work at the following:
 1. Hazardous materials incident
 2. Hazardous materials incident with criminal or terrorist activities.
- OPS-10.6.1** Identify the items to be considered in a safety briefing prior to allowing for criminal or terrorist related incidents to include:
 1. Secondary events intended to incapacitate or delay emergency responders
 2. Armed resistance
 3. Use of weapons
 4. Booby traps
 5. Secondary contamination from handling patients.

Implementing the Planned Response: Initiating the Incident Management System (IMS)

- OPS-11** Given a simulated facility and/or transportation hazardous materials incidents, initiate the Incident Management System (IMS) specified in the local emergency response plan and the organizations SOP's.
- OPS-11.1** Identify the role of the responder at the operational level during hazardous materials incidents as specified in the local emergency response plan and the organizations SOP's.
- OPS-11.2** Identify the levels of hazardous materials incidents as defined in the SERC Uniform Classification System for Categorizing Hazardous Materials Incidents:
 1. Level 1 - Minor
 2. Level 2 - Moderate

3. Level 3 - Major

- OPS-11.3** Identify the purpose, need, benefits and elements of an IMS at hazardous materials incidents.
- OPS-11.4** Identify the considerations for determining the location of the command post for a hazardous materials incident.
- OPS-11.5** Identify the procedures for requesting additional resources at a hazardous materials incident.
- OPS-11.6** Identify the responsibilities of the safety officer as follows:
1. Obtains a briefing from the Incident Commander
 2. Advises the Incident Commander of incident safety considerations and dangerous situations
 3. Monitors the implementation of incident safety considerations
 4. Alters, suspends or terminates any activity that is deemed to be unsafe.

Implementing the Planned Response: Using Personal Protective Equipment

- OPS-12** Demonstrate the ability to don, work in and doff the personal protective equipment provided by the authority having jurisdiction.
- OPS-12.1** Identify the importance of the buddy system in implementing the planned defensive options.
- OPS-12.2** Identify the importance of the backup personnel in implementing the planned defensive actions.
- OPS-12.3** Identify the safety precautions to be observed when approaching and working at hazardous materials incidents.
- OPS-12.4** Identify the signs and symptoms of heat and cold stress.
- OPS-12.5** Identify the physical capabilities required for and the limitations of personnel working in the personal protective equipment as provided by the authority having jurisdiction.
- OPS-12.6** Match the function of the operational components of the positive pressure self-contained breathing apparatus provided the responders to the name of the component.
- OPS-12.7** Identify the procedures for cleaning, sanitizing and inspecting respiratory protective equipment.
- OPS-12.8** Identify the procedures for donning, working in and doffing positive pressure self-contained breathing apparatus.
- OPS-12.9** Demonstrate donning, working in and doffing positive pressure self-contained breathing apparatus. (Note: This competency is for familiarization purposes only and additional, specific training in the safe use of positive pressure self-contained breathing apparatus is required.)

Implementing the Planned Response: Performing Defensive Control Actions

OPS-13 Given a plan of action for a hazardous materials incident within their capabilities, demonstrate the ability to perform the defensive control actions set out in the plan.

OPS-13.1 Understand the types of firefighting foam(s) or vapor suppressing agent(s) and foam equipment furnished by the authority having jurisdiction, understand the proper application of the firefighting foam(s) or vapor-suppressing agents on a spill or fire involving hazardous materials.

OPS-13.2 Identify the characteristics and applicability of the following types of foams:

1. Protein
2. Fluoroprotein
3. Special purpose
 - a. Polar solvent alcohol-resistant concentrates.
 - b. Hazardous materials concentrates
4. Aqueous film-forming foam (AFFF)
5. High expansion.

OPS-13.3 Given the appropriate tools and equipment, describe how to perform the following defensive control activities:

1. Absorption
2. Damming, diking, diversion, and retention
3. Dilution
4. Vapor dispersion
5. Vapor suppression.

OPS-13.4 Understand the location and use of the mechanical, hydraulic and air emergency remote shut-off devices.

OPS-13.5 Describe the objectives and dangers of search and rescue missions at hazardous materials incidents.

OPS-13.6 Describe methods for controlling the spread of radioactive contamination to limit impact.

OPS-13.7 Describe procedures, such as those listed in the Local Emergency Response Plan or the organization's SOPs, to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Evaluating Progress: Evaluation the Status of Defensive Actions

OPS-14 evaluate objectives. Given simulated facility and/or transportation hazardous materials incidents, the status of the defensive actions taken in accomplishing the response

OPS-14.1 Identify the considerations for evaluating whether defensive options are effective in accomplishing the objectives.

OPS-14.2 Describe the circumstances under which it would be prudent to withdraw (pull back) from a hazardous materials incident.

Evaluating Progress: Communicating the Status of the Planned Response

OPS-15 Given simulated facility and/or transportation hazardous materials incidents, demonstrate communicating the status of the planned response to the incident commander through the normal chain of command.

- OPS-15.1** Identify the methods for communicating the status of the planned response to the incident commander through the normal chain of command.
- OPS-15.2** Identify the methods for immediate notification of the incident commander and other response personnel about critical emergency conditions at the incident.

Summary: First Responder Operations Level

Audience

Large training audience. All employees who may participate in operations at a hazardous materials incident.

Prerequisites

First Responder Awareness Level.

Training

Classroom and simulated lab/field instruction. Competencies include: (1) understanding hazardous material terms, basic hazard and risk assessment, and the role of the Employees at the operational level. (2) Ability to perform basic control, containment and/or confinement techniques with proper use of personal protective equipment and following standard operating procedures (SOP's). (3) Ability to implement basic decontamination procedures.

Refresher Training

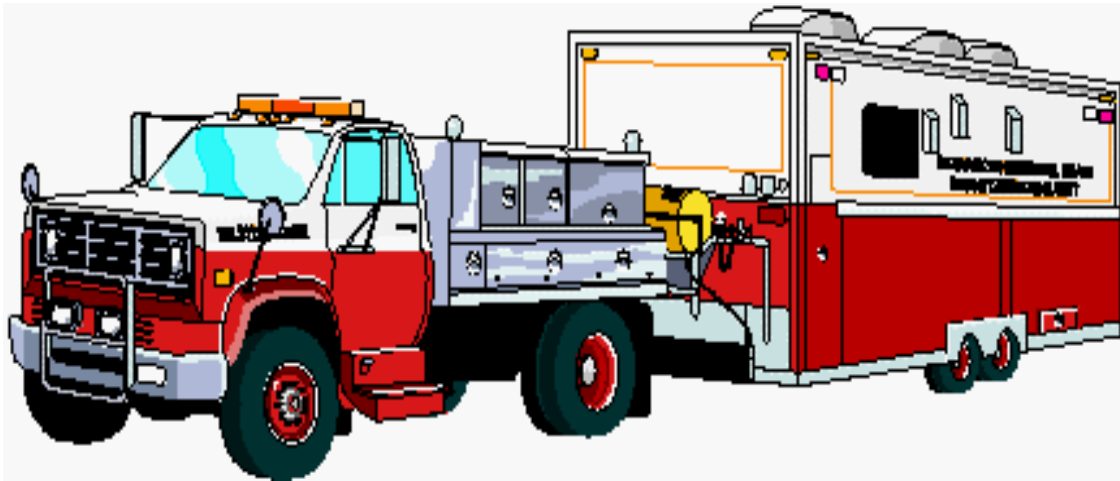
To occur annually;

1. Competency retesting of all response skills.
2. Technical information updates.
3. Incident scene decision-making using simulated emergencies.

FLORIDA STATE EMERGENCY RESPONSE COMMISSION

Guidelines for Hazardous Materials Technicians Hazardous Materials Training

October 1, 2002
~Revised~



Guidelines for Hazardous Materials Technicians Hazardous Materials Training

Introduction

Hazardous Materials Technicians shall be trained to meet all the requirements of the Awareness and Operational levels and the Technician level of emergency hazardous materials response. In addition technicians shall meet the training requirements and be provided medical surveillance in accordance with the requirements of the Occupational Safety and Health Administration (OSHA), Florida Department of Environmental Protection and the U.S. Environmental Protection Agency (EPA), as appropriate for their jurisdiction.

Definition

Technicians are those persons who respond to releases or potential releases for the purpose of controlling the release. They assume a more aggressive role than the First Responder at the Operations Level in that they are trained to approach the point of release to plug, patch or otherwise stop the release of a hazardous materials substance. Technicians are expected to use specialized chemical protective clothing and specialized control equipment.

Audience

Technicians typically are members of hazardous materials response teams, which consist of specially trained personnel who respond to hazardous materials incidents. The teams perform various response actions including assessment, fire fighting, rescue and containment; they are not responsible for cleanup operations following the incidents. Technicians are employed by various public and private organizations including fire, emergency medical services, law enforcement, public health, utilities, manufacturers and contractors. By definition, technicians must be well versed in a wide variety of topics. They are expected to respond to most kinds of hazardous materials incidents that would occur in their jurisdictions. Therefore training managers should be careful not to specialize this broad based training to a great extent.

Related Health and Safety Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)
EPA 40 CFR 311 Worker Protection
NETC Guidelines for Public Sector Hazardous Materials Training, March 1998
NFPA 471, Recommended Practice for Responding to Hazardous Materials Incident (2002 Edition)
NFPA 472, Standard for Competencies for Hazardous Materials Responders (2002 Edition)
NFPA 1561 Standard on Fire Department Incident Management System

Equipment, Facilities, and Resources

Hazardous materials technician training requires classroom and hands-on workspace as well as reference materials, equipment and props. Consideration must be given to class size, weather conditions, number of instructors/evaluators and available equipment and props. Because of the time involved in demonstrations and performance activities, class size must be limited. A reasonable student/teacher ratio would be 30:1 for lecture and 10:1 for hands-on, although some blocks of instruction (such as work with live chemicals) may require a 5:1 ratio. Extreme cold or heat will affect outdoor activities involving suits, chemicals and props. If outdoor exercises involving chemical protective clothing or actual chemicals are to be conducted, neighboring residences and facilities must be considered and notified. Arrangements for secured storage must be made to handle the thousands of dollars worth of equipment that will have to be located near the classroom and work area.

Methodology Recommendations

Hazardous materials technician training is best conducted with a varied mix of classroom instruction using traditional lecture and small activity approaches, field exercises involving group practice in simulated emergencies and hands-on skill training in doing actual control, confinement and containment evolutions. Typically, training ranges from 40 to 240 hours. The Florida State Fire College is currently developing a program for voluntarily certifying the competency of Hazardous Materials Technicians. There should be a strong emphasis on hands-on practice and incident decision-making. Content instruction should be synthesized in student activities requiring analysis of incident information to determine plans of action. Skill training should be performed on actual containers with simulated releases, using full protective equipment and response tools. Skill training should include instructor modeling, student walk-through and student practice under stress until competency is achieved. Proper critiques and corrective instruction are essential. Refresher training should include (1) competency retesting of all response skills; (2) technical information updates; and (3) critique of incident scene decision making using simulated emergencies.

It is the understanding of the SERC that the training outlined here has cognitive and manipulative skills that will take a substantial amount of time to master. It is absolutely imperative that demonstrable competency is assured through the training process. Programs modified or tailored to select groups are acceptable provided competency in all training objectives contained in this document is accomplished.

The SERC estimates that the initial training outlined above can be accomplished in a minimum of 120 hours with competent instructors knowledgeable in hazardous materials response when personnel are trained to the awareness level. Annual refresher should be accomplished with a minimum of 24 hours training.

It is understood that the Florida Department of Insurance, Florida State Fire Marshal's Office, Florida State Fire College is developing a comprehensive Hazardous Materials Technician Program. The program will address both cognitive and manipulative skills. The Fire College will issue certificates of competency for successful completion.

There are other programs available through other organizations and institutions in the State and nothing in this document is intended to be exclusive. It remains the employer's responsibility to comply with OSHA 29 CFR 1910.120 and 40 CFR 311 and NFPA 472.

Training

The following training objectives are recommended for first responder technician level. The primary source for this material is NETC Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

In addition to the awareness and operational level competencies as defined by the SERC, the hazardous materials technician will be competent in the following training objectives:

Hazardous Materials Technician

Recommended Training Objectives

TECH-1 Given a hazardous materials incident scenario, demonstrate an understanding of the role of the hazardous material technician and the need for medical monitoring.

TECH-1.1 Identify the responsibility to analyze the hazardous materials incident and determine the magnitude of the problem in terms of outcomes.

- TECH-1.1.1** Define a confined space and identify the hazards associated with entry into confined spaces.
- TECH-1.1.2** Identify the resources and local SOP's for handling radioactive incidents.
- TECH-1.2** Identify the responsibility to plan a response within the capabilities of available personnel, personal protective equipment and control equipment.
- TECH-1.3** Identify the responsibility to implement the planned response to favorably change the outcomes consistent with the organizations SOP's and/or site safety plan.

Analyzing the Incident: Surveying the Hazardous Materials Incident

- TECH-2** Given hazardous materials incidents and the appropriate equipment, identify special containers involved and identify or classify unknown materials, verify the identity of hazardous materials and determine the concentration of hazardous materials.
- TECH-2.1** Given examples of various specialized containers, identify each container by name and match the hazard class of the materials typically found inside the container.
- TECH-2.1.1** Given examples of the following tank cars, identify each tank car by type and at least one material, and its hazard class:
 1. Cryogenic liquid tank cars
 2. High pressure tube cars
 3. Nonpressure tank cars
 4. Pneumatically unloaded hopper cars
 5. Pressure tank cars.
- TECH-2.1.2** Given examples of the following intermodal tank containers, identify each intermodal tank container by type:
 1. Nonpressure intermodal tanks
 - a. IM-101 portable tanks
 - b. IM-102 portable tanks
 2. Pressure intermodal tanks
 3. Specialized intermodal tank containers:
 - a. Cryogenic intermodal tank containers
 - b. Tube modules.
- TECH-2.1.3** Given examples of the following cargo tanks, identify at least one materials and its hazard class:
 1. MC-306
 2. MC-307
 3. MC-312
 4. MC-331
 5. MC-338
 6. Dry bulk cargo
- TECH-2.1.4** Given examples of the following facility tanks, identify at least one materials and its hazard class:
 1. Nonpressure tanks
 2. Pressure tanks
 3. Cryogenic tanks.

- TECH-2.1.5** Given examples of the following non-bulk containers, identify at least one materials and its hazard class:
1. Bags
 2. Carboys
 3. Cylinders
 4. Drums.
- TECH-2.1.6** For each of the following, describe a method that can be used to detect them:
1. Nerve agents
 2. Vesicants (blister agents)
 3. Biological agents and toxins
 4. Irritants (riot control agents).
- TECH-2.1.7** Given examples of the following radioactive materials packages, identify each package by type and identify at least one typical material found in each package:
1. Type A
 2. Type B
 3. Industrial
 4. Excepted
 5. Strong, tight containers
- TECH-2.2** Given three examples of both facility and transportation containers, identify the approximate quantity in or capacity of each container.
- TECH-2.2.1** Given examples of the following transport vehicles, identify the capacity (by weight and/or volume) of each transport vehicle using the markings on the vehicle:
1. Tank cars
 2. Tank containers
 3. Cargo tanks.
- TECH-2.2.2** Using the markings on the container and other available resources, identify the approximate quantity in or capacity of each container.
1. Nonpressure tank
 2. Pressure tank
 3. Cryogenic tank.
- TECH-2.3** Given at least three unknown materials, one of which is a solid, one a liquid, and one a gas, identify or classify by hazard each unknown material.
- TECH-2.3.1** Identify the steps in the analysis process for identifying unknown solid and liquid materials.
- TECH-2.3.2** Identify the steps in the analysis process for identifying unknown atmosphere.
- TECH-2.3.3** Identify the type(s) of monitoring equipment (test strips and reagents) used to determine the following hazards:
1. Corrosivity (pH)
 2. Flammability / Combustibility
 3. Oxidizing potential
 4. Oxygen deficiency / enrichment
 5. Radioactivity
 6. Toxic exposures.
- TECH-2.3.4** Identify the capabilities and limiting factors associated with the selection and use of the following monitoring equipment, test strips and reagents:
1. Carbon monoxide meter

2. Colormetric tubes
3. Combustible gas indicator (CGI)
4. Oxygen meter
5. Passive dosimeter
6. Photoionization detectors (PID)
7. pH papers, pH meters, and test strips
8. Radiation detection instruments
9. Reagents.

TECH-2.3.5 Demonstrate how radiation detection instruments may be used defensively.

TECH-2.3.6 Given examples of various hazardous materials and the following monitoring equipment, in addition to other monitoring and detection equipment provided by the authority having jurisdiction, select appropriate monitoring equipment to identify and quantify the materials.

1. Carbon monoxide meter
2. Colormetric tubes
3. Combustible gas indicator (CGI)
4. Oxygen meter
5. Passive dosimeter
6. pH papers, pH meters, and test strips
7. Radiation detection instruments
8. Reagents.

TECH-2.3.7 Demonstrate the field maintenance, testing and calibration procedures for the monitoring equipment, test strips and reagents provided by the authority having jurisdiction.

TECH-2.3.8 Demonstrate the use of conversion charts associated with monitoring devices provided by the authority having jurisdiction.

TECH-2.4 Given a label for a radioactive material, identify vertical bars, contents, activity and transport index, then match the label item to its significance in surveying a hazardous materials incident.

Analyzing the Incident: Collecting and Interpreting Hazard and Response Information

TECH-3 Given hazardous materials incident scenarios and access to printed resources, technical resources, computer data bases and monitoring equipment, collect and interpret hazard and response information not available from the current edition of the North American Emergency Response Guidebook or a MSDS.

TECH-3.1 Identify the types of hazard and response information available from each of the following resources and explain the advantages and disadvantages of each resource:

1. Reference manuals for chemicals, toxicology, and equipment
2. Hazardous materials data bases
3. Technician information centers (i.e.. CHEMTREC and NRC)
4. Technical information specialist
5. Monitoring equipment
6. Maps and diagrams.

TECH-3.2 Describe the following terms and explain their significance in the risk assessment process:

1. Acid, caustic
2. Air reactivity

3. Biological agents
4. Boiling point
5. Catalyst
6. Chemical interactions
7. Chemical reactivity
8. Compound, mixture
9. Concentration
10. Corrosivity pH
11. Critical temperatures and pressure.
12. Dose and dose rate
13. Expansion ration
14. Flammable explosive/range (LEL/UEL)
15. Fire and Flash point
16. Half-life
17. Halogenated hydrocarbon
18. Inhibitor
19. Instability
20. Ionic and covalent compounds
21. Irritants (riot control agents)
22. Maximum safe storage temperature
23. Melting point and freezing point
24. Miscibility
25. Nerve agents
26. Organic and inorganic
27. Oxidation potential
28. Physical state (solid, liquid, gas)
29. Polymerization
30. Radioactivity
31. Salt and non-salt
32. Saturated, unsaturated, and aromatic hydrocarbons
33. Solution and slurry
34. Specific gravity
35. Strength
36. Sublimation
37. Temperature
38. Toxic products of combustion
39. Toxins
40. Vapor density
41. Vapor pressure
42. Vesicants
43. Viscosity
44. Volatility
45. Water reactivity
46. Water solubility.

- TECH-3.3** Describe the heat transfer processes that occur as a result of a cryogenic liquid spill.
- TECH-3.4** Given various hazardous materials scenarios and appropriate reference materials, identify the signs and symptoms of exposure to each material and the target organ effects of exposure to that material.
- TECH-3.5** Given the scenario of a residential gas line break and readings for a CGI, determine the areas of evacuation.
- TECH-3.6** Identify two methods for determining the pressure in bulk packaging or facility containers

TECH-3.7 Identify one method for determining the amount of lading remaining in damaged bulk package or facility containers.

Analyzing the Incident: Describing the Condition of the Container Involved in the Incident

TECH-4 Given simulated facility and transportation container damage, describe the damage found using one of the following terms:

1. Undamaged, no product release
2. Damaged, no product release
3. Damaged, product release
4. Undamaged, product release.

TECH-4.1 Given DOT specification markings for non-bulk and bulk packaging (including tank cars, tank containers and cargo tanks) and the appropriate reference guide, identify the design and construction of the packaging and identify examples of the likely materials found in the packaging.

TECH-4.1.1 Given examples of the following containers identify the basic design and construction features, including closures, of each bulk packaging and storage vessel:

1. Fixed facility tanks and storage tanks
2. Intermodal tanks and bulk containers
3. Pipelines
4. Rail cars
5. One-ton containers
6. Cargo tanks (tank trucks and trailers).

TECH-4.1.2 Given examples of the following containers, identify the basic design, construction features and closures found on each container by name.

1. Pressurized cylinders
2. Drums
3. Carboys

TECH-4.1.3 Identify the basic design and construction features of the following radioactive materials containers:

1. Type A
2. Type B
3. Industrial
4. Excepted
5. Strong, tight containers.

TECH-4.1.4 Demonstrate a sampling method for collecting the following:

1. Solid
2. Liquid
3. Gas.

TECH-4.2 Identify how a liquid pipeline may transport different products.

TECH-4.2.1 Given an example of a ruptured domestic pipeline, identify the following

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

TECH-4.2.2 Given an example of a domestic gas line break and the reading from a combustible gas indicator, determine the area of evacuation.

- TECH-4.3** Identify the method for determining the pressure in bulk packaging or facility containers using both a pressure gauge and the temperature of the contents.
- TECH-4.3.1** Identify the method for determining the amount of lading in bulk packaging or facility containers.
- TECH-4.4** Identify the types of damage that containers may incur to include.
1. Cracks
 2. Scores
 3. Gouges
 4. Dents.
- TECH-4.5** Given examples of tank car damage, identify the type of damage in each example by name.
- TECH-4.6** Given a scenario involving radioactive materials, determine if the integrity of any container has been breached using available survey and monitoring equipment.

**Analyzing the Incident: Predicting Likely Behavior of Materials and Their Containers
When Multiple Materials are Involved**

- TECH-5** Given examples of both facility and transportation incidents involving multiple hazardous materials, predict the likely behavior of the contents in each case.
- TECH-5.1** Identify at least three resources available that indicate the effects of mixing various chemicals.
- TECH-5.2** Describe the heat transfer processes that occur as a result of a cryogenic liquid spill.
- TECH-5.3** Identify the impact of the following fire and safety features on the behavior of the products during an incident at a bulk storage facility and explain their significance in the risk assessment process:
1. Fire protection systems (NFPA 30)
 2. Monitoring and detection systems
 3. Product spillage and control (impoundment and diking)
 4. Tank spacing
 5. Tank venting and flaring systems
 6. Transfer operations.

Analyzing the Incident: Estimating the Likely Size of an Endangered Area

- TECH-6** Given various facility and transportation hazardous materials incidents, estimate the size, shape and concentrations associated with the materials involved in the incident using computer modeling, monitoring equipment or specialist in this field.
- TECH-6.1** Identify local resources for dispersion pattern prediction and modeling including computers, monitoring equipment or specialist in the field.
- TECH-6.2** Given the concentration of a released material, Identify the steps for determining the extent of physical, health, and safety hazards within the endangered area of a hazardous materials incident given the concentration of the release.
- TECH-6.2.1** Match the following toxicological terms and exposure values with their significance in predicting the extent of health hazards in a hazardous materials incident.

1. Immediately Dangerous to Life and Health (IDLH).
2. Lethal Concentrations (LC₅₀).
3. Lethal Dose (LD₅₀).
4. Permissible Exposure Limit (PEL).
5. Threshold Limit Value Ceiling (TLV-C).
6. Threshold Limit Value Short-term Exposure Limit (TLV-STEL).
7. Threshold limit value time-weighted average (TLV-TWA).
8. Parts per million (ppm), part per billion (ppb).
9. Emergency Response Planning Guide (ERPG).
10. RAD, Millirem (MREM)
11. Roentgen Equivalent Man (REM).

TECH-6.2.2 Describe the following toxicological terms and exposure values with their significance in predicting the extent of health hazards in a hazardous materials incident.

1. Alpha radiation
2. Beta radiation
3. Gamma radiation
4. Half-life
5. Time, distance and shielding.

TECH-6.2.3 Identify two methods for predicting the areas of potential harm within the endangered area of a hazardous materials incident.

TECH-6.3 Identify the methods for estimating the outcomes within an endangered area of a hazardous materials incident.

Planning the Response: Identifying Response Objectives

TECH-7 Given simulated facility and transportation problems, describe the response objective for each problem and describe the steps for determining response objectives (defensive, offensive and nonintervention) given an analysis of a hazardous materials incident.

Planning the Response: Identifying the Potential Action Options

TECH-8 Given simulated facility and transportation hazardous materials incidents, identify the possible action options (defensive, offensive and nonintervention) by response objective for each problem.

TECH-8.1 Identify the possible action options to accomplish a given response objective.

TECH-8.2 Identify the purpose and the procedures, equipment and safety precautions for each of the following control techniques:

1. Absorption
2. Neutralization
3. Overpacking
4. Patch and plug.

Planning the Response: Selecting Personal Protective Equipment

TECH-9 Given situations with known and unknown hazardous materials, determine the appropriate personal protective equipment for the action options specified in the plan of action in each situation.

TECH-9.1 Identify the four levels of chemical protection (EPA/NIOSH) and match both the equipment required for each level and the conditions under which each level is used.

- TECH-9.2** Identify the factors to be considered in selecting the proper respiratory protection for a specified option.
- TECH-9.2.1** Describe the advantages, limitations and proper use of the following type of respiratory protection at hazardous materials incidents:
1. Air purifying respirator (APR)
 2. Supplied air respirator (air line respirator) (SAR)
 3. Positive pressure self-contained breathing apparatus (SCBA).
- TECH-9.2.2** Identify the process for selecting the proper respiratory protection at hazardous materials incidents.
- TECH-9.2.3** Identify the operational components of the air purifying respirators and supplied air respirators by name and match the function to the component.
- TECH-9.3** Identify the factors to be considered in selecting the proper chemical-protective clothing for a specified option.
- TECH-9.3.1** Match the following terms with their definition and explain their impact and significance on the selection of chemical-protective clothing:
1. Degradation
 2. Penetration
 3. Permeation.
- TECH-9.3.2** Identify at least three indications of material degradation of chemical-protective clothing.
- TECH-9.3.3** Identify the three types of vapor protective and splash protective clothing and describe the advantages and disadvantages of each type.
- TECH-9.3.4** Identify the relative advantages and disadvantages of: heat exchange unit, air-cooled jackets, water-cooled jackets and ice-vest used for the cooling of personnel in chemical-protective clothing.
- TECH-9.3.5** Identify the process for selecting the proper protective clothing at hazardous materials incidents.
- TECH-9.3.6** Given examples of various hazardous materials, determine the appropriate protective clothing construction materials for a given action option using chemical compatibility charts.
- TECH-9.3.7** Identify the physical and psychological stresses that can affect users of specialized protective clothing.

Planning the Response: Developing Appropriate Decontamination Procedures

- TECH-10** Given a simulated hazardous materials incident, select an appropriate decontamination procedure and determine the equipment required to implement that procedure.
- TECH-10.1** Identify the advantages and limitations and describe an example where each of the following decontamination methods would be used:
1. Absorption
 2. Adsorption
 3. Chemical and physical degradation
 4. Dilution
 5. Disposal
 6. Evaporation

7. Neutralization
8. Solidification
9. Vacuuming
10. Washing.

TECH-10.2 Identify the sources of technical information for selecting appropriate decontamination procedures and identify how to contact those sources in an emergency.

Planning the Response: Developing a Plan of Action

TECH-11 Given simulated hazardous materials incidents in facility and transportation settings, develop plans of action, including safety considerations, which are consistent with the local emergency response plan and the organization's SOP's, and which are within the capability of available personnel, personal protective equipment, and control equipment.

TECH-11.1 Describe the purpose of, procedures for, equipment required and safety precautions used with the following techniques for hazardous materials control:

1. Absorption.
2. Neutralization.
3. Overpacking.
4. Patching and plugging.

TECH-11.2 Given an MC-306/DOT-406, MC-307/DOT-407, MC-312/DOT-412, MC-331 and MC-338 cargo tanks, identify the common methods for product transfer form each type of tank.

TECH-11.3 Develop a site safety plan for a hazardous materials incident.

TECH-11.3.1 Describe the components of a site safety plan for a hazardous materials incident.

TECH-11.3.2 Given a simulated hazardous materials incident, demonstrate the ability to develop a site safety plan.

TECH-11.4 Given a simulated hazardous materials incident, develop the safety consideration that must be included in the plan of action.

TECH-11.4.1 List and describe the safety consideration to be included

TECH-11.4.2 Given a plan of action for a simulated hazardous materials incident, identify the points that should be made in a safety briefing prior to working on the scene.

TECH-11.4.3 Identify the atmospheric and physical safety hazards associated with hazardous materials incidents involving confined spaces.

TECH-11.4.4 Identify the pre-entry activities to be performed.

TECH-11.4.5 Identify the procedures, equipment and safety precautions for collecting legal evidence at hazardous materials incidents.

Implementing the Planned Response: Performing Incident Management Duties

TECH-12 Given the local emergency response plan or organization's SOP's and a simulated hazardous materials incident, demonstrate the duties of an assigned hazardous materials branch position within the local Incident Management System (IMS).

- TECH-12.1** Identify the role, specified in the local emergency response plan and the organization's SOP's, of the hazardous materials technician during a hazardous materials incident.
- TECH-12.2** Given the local emergency response plan or organization's SOP's, identify the duties and responsibilities of the following hazard group functions within the incident management system, including:
1. Backup
 2. Decontamination and Medical
 3. Entry and Reconnaissance
 4. Hazardous Materials Branch Management
 5. Hazardous Materials Branch Safety
 6. Information and Research
 7. Resources.
- TECH-12.2.1** Given the local emergency response plan or the organizations SOP's, identify the duties and responsibilities of the hazard group officer and describe how to coordinate all activities of that group.
- TECH-12.3** Given a simulated hazardous materials incident, demonstrate setup of the contamination reduction corridor as specified in the planned response.
- TECH-12.4** Given a simulated hazardous materials incident, demonstrate how to perform the decontamination process specified in the planned response.

Implementing the Planned Response: Using Protective Clothing and Respiratory Protection

- TECH-13** Demonstrate the ability to don, work in and doff both liquid splash and vapor protective clothing and any other specialized personal protective equipment provided by the authority having jurisdiction, with the appropriate respiratory protection.
- TECH-13.1** Identify the safety procedures for personnel wearing vapor protective clothing.
- TECH-13.2** Identify three safety and emergency procedures for personnel wearing vapor protective clothing.
1. Loss of air supply
 2. Loss of suit integrity
 3. Loss of verbal communication system.
- TECH-13.3** Identify the procedures for donning, working in and doffing the following types of respiratory protection:
1. Air purifying respirator
 2. Supplied air respirator (SAR) and required escape unit (air line respirator).
- TECH-13.4** Demonstrate donning, working in and doffing chemical protective clothing in addition to any other specialized protective equipment provided by the authority having jurisdiction.
- TECH-13.5** Demonstrate the ability to record the use, repair and testing of chemical protective clothing according to the manufacturer's specifications and recommendations.
- TECH-13.6** Describe the maintenance, testing, inspection and storage procedures for personal protective equipment provided by the authority having jurisdiction according to the manufacturer's specifications and recommendations.

Implementing the Planned Response: Performing Control Functions Identified in Plan of Action

- TECH-14** Given various simulated hazardous materials incidents involving non-bulk packaging and facility containers, select the tools, equipment and materials for the control of hazardous materials incidents and identify the precautions for controlling releases from those packages/containers.
- TECH-14.1** Given non-bulk and bulk pressure vessel/containers, select the appropriate material or equipment and demonstrate a method(s) to contain the following leaks:
1. Fusible metal plug
 2. Fusible plug threads
 3. Side wall of cylinder
 4. Valve blowout
 5. Valve gland
 6. Valve inlet threads
 7. Valve seat
 8. Valve stem assembly blowout.
- TECH-14.2** Given the fittings on a pressure container, demonstrate the ability to:
1. Close open valves
 2. Tighten loose plugs
 3. Replace missing plugs.
- TECH-14.3** Given a 55 gallon drum, demonstrate the ability to contain the following leaks using appropriate tools and materials:
1. Bung leak
 2. Chime leak
 3. Nail puncture
 4. Forklift puncture.
- TECH-14.4** Given a 55 gallon drum and an overpack drum, demonstrate the ability to place the 55 gallon drum into the overpack drum using the following methods:
1. Slide-in
 2. Rolling slide-in
 3. Slip-over.
- TECH-14.5** 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.
- TECH-14.6** Identify three considerations for assessing a leak or spill inside a confined space without entering the area.
- TECH-14.7** Identify the safety considerations for product transfer operations, including bonding, grounding, elimination of ignition sources and shock hazards.
- TECH-14.8** Given an MC-306 cargo tank and a dome cover clamp, demonstrate the ability to install the clamp on the dome properly.
- TECH-14.9** Identify the methods and precautions used when controlling a fire involving an MC-306 aluminum shell cargo tank.
- TECH-14.10** Describe methods for containing the following leaks in MC306, MC-307 and MC-312 cargo tanks:
1. Dome cover leak
 2. Puncture
 3. Irregular-shaped hole
 4. Split or tear.

- TECH-14.11** Describe product removal and transfer considerations for overturned MC-306, MC-307, MC-312, MC-331 and MC-338 cargo tanks, including:
1. Inherent risk associated with such operations
 2. Procedures and safety precautions as bonding, grounding and elimination of ignition sources and shock hazards
 3. Equipment required.

Evaluating Progress: Evaluating the Effectiveness of the Control Functions

- TECH-15** Given hazardous materials incident scenarios and the task of implementing the plan of action, demonstrate the ability to evaluate the effectiveness of any control function identified in the plan of action.

Terminating the Incident: Assisting in the Debriefing

- TECH - 16** Given the details of a simulated facility and transportation hazardous materials incidents involving non-bulk and bulk packaging, participate in the debriefing of the incident.
- TECH - 16.1** Describe three components of an effective debriefing.
- TECH - 16.2** Describe the key topics in an effective debriefing.
- TECH - 16.3** Describe when a debriefing should take place.
- TECH - 16.4** Describe who should be involved in a debriefing
- TECH - 16.5** Identify the procedure for conducting debriefings at a hazardous materials incident.

Terminating the Incident: Assisting in the Incident Critique

- TECH – 17** Given a simulated multi-agency hazardous materials incident, provide operational observations of the activities that were performed in the hot and warm zones during the incident.
- TECH – 17.1** Describe three components of an effective critique.
- TECH – 17.2** Describe who should be involved in a critique.
- TECH – 17.3** Describe why an effective critique is necessary after a hazardous materials incident.
- TECH – 17.4** Describe what written documents should be prepared as a result of the critique.
- TECH – 17.5** Implement the procedure for conducting a critique of the incident.

Terminating the Incident Providing Reports and Documentation

- TECH – 18** Given a simulated hazardous materials incident, complete the reporting and documentation requirements consistent with the organization's ERP and SOP's requirements.

- TECH - 18.1** Identify the reports and supporting documentation required by the local ERP and the organization's SOP's.
- TECH - 18.2** Demonstrate the proper completion of required reports as identified in the local ERP and the organization's SOP's.
- TECH - 18.3** Identify the importance of documentation for a hazardous materials incident including training records, personnel exposure records, incident reports and critique reports.
- TECH - 18.4** Identify the steps in keeping an activity log and exposure records for hazardous materials incidents.
- TECH - 18.5** Identify the step to be taken in compiling incident reports that meet federal, state, local and organization's SOP's.
- TECH - 18.6** Identify the requirements for compiling hot zone entry and exit logs.
- TECH - 18.7** Identify the requirements for compiling personal protective equipment logs.
- TECH - 18.8** Identify the requirements for filing documents and maintaining records found in the local emergency response plan and the organization's SOP's.
- TECH - 18.9** Identify the procedures required for legal documentation and chain of custody/continuity described in the organization's SOP's or the local emergency operating plan.

Summary: Hazardous Materials Technician Level

Audience

Narrow. Prospective hazardous materials team members and others who are designated in response plans as a general resource to perform advanced defensive and offensive operations at all anticipated hazardous materials emergencies.

Prerequisites

First Responder Awareness Level

First Responder Operational Level training (Minimum of 24 hours required)

Training

Programs range from 40 to 240-hours nationally. It is recognized nationally that 40-hour programs for Technician Level, i.e. HazMat Team members is totally inadequate. There are case studies where limited training was identified as a contributing factor to the accident where response personnel were killed or seriously injured. The Florida State Fire College has developed a comprehensive 120-hour Technician program. Programs ranging in the 40 – 160-hours are currently in place within the State. Programs requiring less hours generally take into consideration prior cognitive knowledge. It is imperative to remember that program participants must be capable of *demonstrating* competency in *all* stated objectives.

Classroom and simulated lab/field instruction with emphasis on hands-on training. Competencies include: 1) Knowledge of the role of the hazardous materials technician within the incident command system and responsibilities within the employer's emergency response plan. 2) Knowledge of hazardous materials terminology, behavior and ability to perform advanced hazard and risk assessment using field survey instruments and equipment. 3) Ability to select and use specialized personal protective equipment. 4) Ability to implement decontamination procedures. 5) Knowledge of termination procedures.

Refresher Training

To occur annually;

1. Competency retesting of all response skills.
2. Technical information updates.
3. Incident scene decision-making using simulated emergencies.

References

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)
EPA 40 CFR 311 Worker Protection
NFPA 471, Recommended Practice for Responding to Hazardous Materials Incident (2002 Edition)
NFPA 472, Standard for Competencies for Hazardous Materials Responders (2002 Edition)
NFPA 1561 Standard on Fire Department Incident Management System
NETC, Guidelines for Public Sector Hazardous Materials Training (March 1998)

FLORIDA STATE EMERGENCY RESPONSE COMMISSION

Guidelines for Incident Commanders Hazardous Materials Training

October 1, 2002

~Revised~



Guidelines for Incident Commander Hazardous Materials Training

Introduction

In Title 29 of the Code of Federal Regulations, 1910.120 (q)(6)(v), OSHA sets the minimum level of training and competencies required for Incident Commanders. Incident Commanders who will assume control of the incident scene beyond the first responder at the awareness level shall receive at least 24 hours of training equal to the first responder at the operations level as well as training to the competencies defined in this section. The U.S. Environmental Protection Agency, individual States, and local agencies may require that Incident Commanders have additional training or competencies.

Definition

The Incident Commander is the person responsible for all decisions relating to the management of an incident and is in charge of the incident site. This is equivalent to the On-scene Incident Commander as defined by OSHA 29 CFR 1910.120.

Audience

Incident Commanders may be employed by public emergency response or private agencies that may respond to hazardous materials incidents. They are typically employees of law enforcement agencies, fire departments, emergency medical services, emergency management agencies, public works departments or any other agencies that may be expected to take the lead responsibility at a hazardous materials incident.

Related Health, Safety, and Performance Standards

OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (7/1/99)
EPA 40 CFR 311 Worker Protection
NECT Guidelines for Public Sector Hazardous Materials Training, (March 1998)
NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents (2002 Edition)
NFPA 472, Standard for Competencies for Hazardous Materials Responders (2002 Edition)
NFPA 1561 Standard on Fire Department Incident Management

Appropriate Methodologies

Hazardous Materials Incident Commander training should include a combination of traditional classroom lecture with small group actives and large-group field exercises. Small-group classroom activities focusing on using the Incident Command System should be progressive in terms of incident complexity and resource management complexity. Tabletop, field exercises or large group incident scene simulations are optimal for overall command structure practice to develop effective incident management skills. For proper skill development during scenario practice, it is essential that there be proper critiques and corrective instruction of incident resource organization, style, choice of delegation of command responsibilities, management of communication systems and transfer of command. Testing and evaluation consist of a written examination and post incident critique of simulations, including solutions to small-group activities and field exercises. Refresher training should include review of command structure SOP's, technical updates on State and Federal response plans and field exercise practice performing command roles in simulated emergencies.

The SERC estimates that the training outlined above for the Incident Commander can be accomplished in approximately 24 hours with competent instructors knowledgeable in hazardous materials response incident command. Annual refresher training should be accomplished with approximately 4 contact hours of training. Certificates should be issued for successful demonstration of competency for both initial and hazardous materials refresher training.

Training

Employers are required to ensure that Incident Commanders at hazardous materials incidents demonstrate competency in the skills required for Incident Management. All Incident Commanders will be trained to the operational level utilizing the Florida First Responder Awareness and Operational Level Hazardous Materials Training Programs, National Fire Academy Program - Initial Response to Hazardous Materials Incidents Basic Concepts *and* Concept Implementation or similar curricula complying with the First Responder Awareness and First Responder Operational competencies. In addition the Incident Commander will be trained in the incident command competencies included in this document.

First Responder Awareness and First Responder Operational competencies are included here for reference.

The following training objectives are recommended for first responder awareness level. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

First Responder Awareness

Recommended Training Objectives

- AWARE-1** Given a hazardous materials incident scenario, demonstrate an understanding of the role of the Firefighter at the awareness level.
- AWARE-1.1** Describe the responsibility to analyze the incident to determine the hazardous materials present and the basic hazard and response information for each type of hazardous material and demonstrate the ability to do the following:
- AWARE-1.1.1** Identify the responsibility to detect the presence of hazardous materials.
- AWARE-1.1.2** Identify the responsibilities to survey a hazardous materials incident, from a safe location, to identify the name, UN/NA identification number or type placard applied for any hazardous material involved.
- AWARE-1.1.3** Identify the responsibility to collect hazard information from the current edition of the *North American Emergency Response Guidebook* (ERG).
- AWARE-1.2** Describe the responsibility to implement actions consistent with the local emergency response plan, the organization's SOP's and the current edition of the *North American Emergency Response Guidebook*, and demonstrate the ability to do the following:
- AWARE-1.2.1** Identify the responsibility to initiate protective actions consistent with the local emergency response plan, the organization's SOP's and the current edition of the *North American Emergency Response Guidebook*.
- AWARE-1.2.2** Identify the responsibility to initiate the notification process specified in the local emergency response plan and the organization's SOP's.

Analyzing the Incident - Detecting the Presence of Hazardous Materials

- AWARE-2** Given incident scenarios involving facility and/or transportation situations with and without hazardous materials present, identify those situations where hazardous materials are present.

- AWARE-2.1** Identify the definition of hazardous materials.
- AWARE-2.2** Identify the USDOT Hazard Classes and divisions of hazardous materials and identify common examples of each hazard class or division.
- AWARE-2.3** Identify the primary hazards associated with each of the USDOT Hazard Classes and divisions of hazardous materials by hazard class or division.
- AWARE-2.4** Identify the difference between hazardous materials emergencies and other emergencies.
- AWARE-2.5** Identify typical occupancies and locations in the community where hazardous materials are manufactured, stored, transported, used or disposed of.
- AWARE-2.6** Identify typical container shapes that may indicate hazardous materials.
- AWARE-2.7** Identify facility and transportation markings and colors that indicate hazardous materials, including:
1. UN/NA identification number
 2. NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response
 3. Military hazardous materials markings
 4. Special hazard communication markings
 5. Pipeline markers
 6. Container markings.
- AWARE-2.8** Given an NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response marking, identify the significance of the colors, numbers and special symbols.
- AWARE-2.9** Identify US and Canadian placards and labels that indicate hazardous materials.
- AWARE-2.10** Identify the basic information on material safety data sheets (MSDS) and shipping papers that indicate hazardous materials.
- AWARE-2.10.1** Identify where to find material safety data sheets (MSDS).
- AWARE-2.10.2** Identify entries on a material safety data sheet that indicate the presence of hazardous materials.
- AWARE-2.10.3** Identify the entries on shipping papers that indicate the presence of hazardous materials.
- AWARE-2.10.4** Match the name of the shipping papers found in transportation (air, highway, rail and water).
- AWARE-2.10.5** Identify the person responsible for having the shipping papers in each mode of transportation.
- AWARE-2.10.6** Identify where the shipping papers are found in each mode of transportation.
- AWARE-2.10.7** Identify where the papers can be found in an emergency in each mode of transportation.
- AWARE-2.11** Identify examples of clues (other than occupancy/location, container shape, markings/color, placards/labels and shipping papers) that use the senses of sight, sound and odor to indicate the presence of hazardous materials.

1. Changes in pressure release
2. Presence of smoke and/or fire
3. Presence of liquids, gas leaks, or vapor cloud
4. Chemical reactions
5. Condensation lines
6. Mass Casualties.

AWARE-2.12 Describe the limitations of using the senses in determining the presence or absence of hazardous materials.

AWARE-2.13 Identify types of locations that may become targets for criminal or terrorist activity using hazardous materials. The following are some examples of locations:

1. Public assembly areas
2. Public/Government buildings
3. Mass transit systems
4. Places with high economic impact
5. Telecommunications facilities
6. Places with historical or symbolic significance
7. Military facilities
8. Airports, Train Stations and Ports
9. Industrial facilities.

AWARE-2.14 Identify at least four indicators of possible criminal or terrorist activity involving hazardous materials. The following are some examples of indicators:

1. Hazardous materials or lab equipment that is not relevant to the occupancy
2. Intentional release of hazardous materials
3. Unexplained patterns of sudden onset illnesses or deaths
4. Unusual orders or tastes
5. Mass casualty incident with unexplained signs of skin, eye or airway irritation
6. Unusual security, locks, bars on windows, covered windows and barbed wire
7. Unexplained vapors clouds, mists and plumes
8. Patients twitching, tightness in chest, sweating, pin-point pupils (miosos), runny nose (rhinorrhea), and nausea and vomiting.
9. Unusual presence of natural indicator such as sick or dead birds and animals or dead or discolored trees, shrubs or grass.

AWARE-2.15 Describe the difference between a chemical and a biological incident.

1. Chemical incidents are identified by the rapid onset of medical signs and symptoms characteristic of chemical exposure. Natural indicators and obvious signs of release may be present such as chemical residue and odors.
2. Biological incidents are gradual in onset of medical signs and symptoms with no obvious characteristic of odor or colors. The migration of the disease by infected individuals may be wide spread and transmission from one person to another may occur.

AWARE-2.16 Identify at least four indicators of possible criminal or terrorist activity involving biological agents. The following are some examples of indicators:

1. Mass causality incident with unusual number of ill or dying persons with common signs and symptoms.
2. Hospitals reporting mass causalities with similar signs and symptoms.
3. Unscheduled outdoors spraying
4. Abandoned spraying (dissemination) device.

Analyzing the Incident: Surveying the Hazardous Materials Incident from a Safe Location

- AWARE-3** Given simulated facility and transportation incidents involving hazardous materials, identify the hazardous material(s) in each situation by name, UN/NA identification number and/or type placard applied.
- AWARE-3.1** Identify difficulties encountered in determining the specific names of hazardous materials in both facilities and transportation.
- AWARE-3.2** Identify the significance of the terms “Type A”, “Type B” and “Special Form” as they relate to radioactive materials packaging.
- AWARE-3.3** Identify additional information concerning radionuclide identity and activity provided on radioactive material labels and shipping papers.
- AWARE-3.4** Identify additional information concerning physical and chemical form and packaging type provided on radioactive materials shipping papers.
- AWARE-3.5** Identify sources for obtaining the names of, UN/NA identification numbers for or type of placards associated with hazardous materials in transportation.
- AWARE-3.6** Identify sources for obtaining the names of hazardous materials in a facility.

Analyzing the Incident: Collecting Hazard Information

- AWARE-4** Given the identity of various hazardous materials (name, UN/NA number or type placard), identify the fire, explosion and health hazard information for each material using the current edition of the *North American Emergency Response Guidebook*.
- AWARE-4.1** Identify the way hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- AWARE-4.2** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-4.3** Given the current edition of the *North American Emergency Response Guidebook*, identify the three methods for determining the appropriate guide page for a specific hazardous material.
- AWARE-4.4** Given the current edition of the *North American Emergency Response Guidebook*, identify the two general types of hazards found on each guide page.
- AWARE-4.5** Identify the difficulties encountered in using the senses to recognize radioactive material releases and radiation exposure.

Analyzing the Incident – Initiating Protective Actions

- AWARE-5** Given simulated facility and transportation hazardous materials incidents, identify the actions to be taken to protect themselves and others and to control access to the scene using the local emergency response plan, the organization’s SOP’s or the current edition of the *North American Emergency Response Guidebook*.
- AWARE-5.1** Identify the location of both the local emergency response plan and the organization’s SOP’s.
- AWARE-5.2** Given the local emergency response plan or the organization’s SOP’s, identify the role of the first responder at the awareness level during a hazardous material incident.

- AWARE-5.2.1** Given a simulated facility and/or transportation hazardous materials incidents, initiate the incident management system (IMS) specified in the local emergency response plan and the organizations SOP's.
- AWARE-5.2.2** Identify the basic techniques for the following protective actions at hazardous materials incidents.
1. Evacuation
 2. In-place protection.
- AWARE-5.3** Given the local emergency response plan or the organization's SOP's, identify the basic precautions to be taken to protect themselves and others in a hazardous materials incident.
- AWARE-5.3.1** Identify circumstances involving radioactive material in transportation where actions should be initiated to protect the lives of accident victims through carrying out rescue and providing emergency medical care.
- AWARE-5.3.2** Identify the precautions necessary when providing emergency medical care to victims of hazardous materials incidents.
- AWARE-5.3.3** Identify typical ignition sources found at scenes of hazardous materials incidents.
- AWARE-5.3.4** Identify the ways hazardous materials are harmful to people, the environment and property at hazardous materials incidents.
- AWARE-5.3.5** Identify the general routes of entry for human exposure to hazardous materials.
- AWARE-5.4** Given the identity of various hazardous materials (name, UN/NA identification number or type placard), identify the following response information using the current edition of the *North American Emergency Response Guidebook*:
1. Emergency Action (fire, spill, leak and first aid)
 2. Personal protective equipment necessary
 3. Initial isolation and protective action distances.
- AWARE-5.4.1** Given the name of a hazardous material identify the recommended personal protective equipment from the following list:
1. Street clothing and work uniforms
 2. Structural fire-fighting protective clothing
 3. Positive pressure self-contained breathing apparatus (SCBA)
 4. Chemical-protective clothing and equipment.
- AWARE-5.4.2** Identify the definitions for each of the following protective actions:
1. Isolation of the hazard area and denial of entry
 2. Evacuation
 3. Sheltering in-place protection.
- AWARE-5.4.3** Identify the shapes of recommended initial isolation and protective action zones.
- AWARE-5.4.4** Describe the difference between small and large spills as found in the table of Initial Isolation and Protective Actions Distances.
- AWARE-5.4.5** Identifying the circumstances under which the following distances are used at a hazardous materials incident:
1. Table of initial isolation and protective action distances

2. Isolation distances in the numbered guides.

AWARE-5.4.6 Given a copy of the current edition of the *North American Emergency Response Guidebook*, describe the difference between the isolation distances in the orange-bordered guide pages and the protective action distances in the green-bordered pages in the document.

AWARE-5.5 Identify the techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials incidents.

AWARE-5.6 Identify the specific actions necessary when an incident is suspected to involve criminal or terrorist activity. The following are some examples:

1. Take self protective actions
2. Be alert to secondary devices
3. Communicate the suspicion during the notification process
4. Establish work control zones and access control points
5. Isolate potentially exposed people
6. Document the initial observation
7. Prevent secondary contamination
8. Attempt to preserve evidence while performing operational duties.

Implementing the Response – Initiating the Notification Process

AWARE-6 Given either a facility or transportation scenario of hazardous materials incidents, with and without criminal or terrorist activities, identify the appropriate notifications to be made and how to make them, consistent with the local emergency response plan or the organization's SOP's.

AWARE-6.1 Identify the initial notification procedures for hazardous materials incidents in the local emergency response plan or the organization's SOP's.

The following training objectives are recommended for first responder operational level. The primary source for this material is NETC Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

First Responder Operational Level:

Recommended Training Objectives

OPS-1 Given a hazardous materials incident scenario, demonstrate an understanding of the First Responder at the operations level.

OPS-1.1 Describe the responsibility to analyze the hazardous materials incident and determine the magnitude of the problem in terms of outcomes, and demonstrate the ability to do the following:

OPS-1.1.1 Identify the responsibility to survey the hazardous materials incident to determine the containers and materials involved, whether hazardous materials have been released, and the surrounding conditions.

OPS-1.1.2 Identify the responsibility to collect hazard and response information from MSDS, CHEMTREC and shipper / manufacturer contacts.

OPS-1.1.3 Identify the responsibility to predict likely behavior of a material and its container.

- OPS-1.1.4** Identify the responsibility to estimate the potential harm at a hazardous materials incident.
- OPS-1.2** Describe the responsibility to plan an initial response within the capabilities and competencies of available personnel, personal protective equipment and control equipment, and demonstrate the ability to do the following:
- OPS-1.2.1** Identify the responsibility to describe the response objectives available for hazardous materials incidents.
- OPS-1.2.2** Identify the responsibility to describe the defensive options available for a given response objective.
- OPS-1.2.3** Identify the responsibility to determine whether the personal protective equipment provided is appropriate for implementing each defensive option.
- OPS-1.2.4** Identify the responsibility to identify the emergency decontamination procedures.
- OPS-1.3** Describe the responsibility to implement the planned response to favorably change the outcomes consistent with the local emergency response plan and the organization's SOP's, and demonstrate the ability to do the following:
- OPS-1.3.1** Identify the responsibility to establish and enforce scene control procedures including control zones, emergency decontamination and communications.
- OPS-1.3.2** Identify the responsibility to initiate the Incident Management System (IMS) for hazardous materials incidents.
- OPS-1.3.3** Identify the responsibility to don, work in and doff personal protective equipment provided by the authority having jurisdiction.
- OPS-1.3.4** Identify the responsibility to perform defensive control functions identified in the action plan.
- OPS-1.4** Describe the responsibility to evaluate the progress of the actions taken to ensure that the response objectives are being met safely, effectively, and efficiently and demonstrate the ability to do the following:
- OPS-1.4.1** Identify the responsibility to evaluate the status of the defensive actions taken in accomplishing the response objectives.
- OPS-1.4.2** Identify the responsibility to communicate the status of the planned response.

Analyzing the Incident: Surveying the Hazardous Materials Incident

- OPS-2** Given examples of both facility and transportation situations involving hazardous materials, survey the hazardous materials incident to determine the container materials involved, whether hazardous materials have been released, and the surrounding conditions. The survey should include the following:
- and
1. Inventory of the type of containers involved
 2. Container identification markings
 3. Container quantity or capacity
 4. Involved materials
 5. Release information
 6. Surrounding conditions.

- OPS-2.1** Given examples of various hazardous materials containers, identify the general shapes of containers for liquids, gases and solid hazardous materials that are typically found.
- OPS-2.1.1** Given examples of the following tank cars, identify each tank car by type:
1. Nonpressure tank cars with and without expansion domes
 2. Pressure tank cars
 3. Cryogenic liquid tank cars
 4. Pneumatically unloaded hopper cars
 5. High-pressure tube cars.
- OPS-2.1.2** Given examples of the following intermodal tank containers, identify each intermodal tank container by type; identify one material and its USDOT Hazard Class that is typically found in each tank:
1. Nonpressure intermodal tank containers (IM-101 and IM 102)
 2. Pressure intermodal tank containers
 3. Special intermodal tanks (Cryogenic and tube modules).
- OPS-2.1.3** Given examples of the following cargo tank by type:
1. Nonpressure liquid tanks (MC-306)
 2. Low pressure chemical tanks (MC307)
 3. Corrosive liquid tanks (MC-312)
 4. High pressure tanks (MC-331)
 5. Cryogenic liquid tanks (MC-338)
 6. Dry bulk cargo tanks
 7. Compressed gas tube trailers.
- OPS-2.1.4** Given examples of the following facility tanks, identify at least one material and its hazard, that are typically found in each fixed facility tank by type:
1. Nonpressure tank
 2. Pressure tank
 3. Cryogenic liquid tank.
- OPS-2.1.5** Given examples of the following non-bulk packages, identify each package by type:
1. Bags
 2. Carboys
 3. Cylinders
 4. Drums.
- OPS-2.1.7** Given examples of various radioactive material containers, identify each container/package by type:
1. Type A Package
 2. Type B Package
 3. Industrial
 4. Excepted
 5. Strong, tight containers.
- OPS-2.2** Given examples of facility and transportation containers, identify the markings that differentiate one container from another.
- OPS-2.2.1** Given examples of the following marked transport vehicles and their corresponding shipping papers, identify the vehicle or tank identification marking:
1. Rail transportation vehicles, including tank cars
 2. Intermodal equipment including tank containers
 3. Highway transport vehicles, including cargo tanks.

- OPS-2.2.2** Given examples of the facility containers, identify the markings indicating container size, product contained and /or site identification numbers.
- OPS-2.3** Given examples of the facility and transportation scenario involving hazardous materials, identify the name(s) of the hazardous material(s) in each situation.
- OPS-2.3.1** Identify the following information on a pipeline marker:
1. Product
 2. Owner/operator
 3. Emergency telephone number.
- OPS-2.3.2** Given a pesticide label, identify each of the following pieces of information; then match the piece of information to its significance in surveying the hazardous material incident:
1. Name of pesticide
 2. Signal word
 3. Pest control product number
 4. Precautionary statement
 5. Hazard statement
 6. Active ingredient.
- OPS-2.3.3** Given a radioactive material label identify vertical bars, contents and activity and transport index.
- OPS-2.4** Identify and list surrounding conditions that should be noted when surveying hazardous materials incidents. Surrounding conditions may include:
1. The topography, land use, bodies of water and accessibility
 2. Weather conditions
 3. Public exposure potential, adjacent land use (rail lines, roadways, ports and airports)
 4. Utilities, pipelines, storm and sewer drains
 5. Ignitions sources
 6. Nature and extent of injuries
 7. Building information such as floor drains, ventilation ducts and returns should be considered.
- OPS-2.5** Give examples of ways to verify information obtained from the surveying of a hazardous materials incident.
- OPS-2.6** Identify at least three additional hazards that could be associated with an incident involving criminal or terrorist activity. The following are some examples of hazards:
1. Secondary events intended to delay or incapacitate emergency responders
 2. Armed resistance
 3. Use of weapons
 4. Booby traps
 5. Secondary contamination from handling patients
 6. Hostage barricade situations.

Analyzing the Incident: Collecting Hazard and Response Information

- OPS-3** Given known hazardous materials, collect hazard and response information from MSDS, CHEMTREC and contacts with the shipper/manufacturer.

- OPS-3.1** Match the definitions associated with the USDOT Hazard Classes and divisions of hazardous materials, including refrigerated gases and cryogenic liquids, with the class or division.
- OPS-3.2** Identify two ways to obtain a MSDS in an emergency.
- OPS-3.3** Using a MSDS for a specified material, identify the following hazard and response information:
1. Physical and chemical characteristics
 2. Physical hazards of the material
 3. Health hazards of the material
 4. Signs and symptoms of exposure
 5. Routes of entry
 6. Permissible exposure limits
 7. Responsible party contact
 8. Precautions for safe handling (including hygiene practices, protective measures, procedures for clean up of spills and leaks)
 9. Applicable control measures including personal protective equipment
 10. Emergency and first aid procedures.
- OPS-3.4** Identify the following:
1. The type of assistance provided by CHEMTREC.
 2. How to contact CHEMTREC.
 3. The information to be furnished to CHEMTREC.
- OPS-3.5** Identify two methods of contacting the manufacturer or shipper to obtain hazard and response information.
- OPS-3.6** Identify two type of assistance provided by local, state and federal authorities, with respect to criminal or terrorist activities involving hazardous materials.
- OPS-3.6.1** Identify the procedure for contacting local, state and federal authorities as specified in the local emergency response plan (ERP) or the organization's SOP's.
- OPS-3.7** Describe the properties and characteristics of the following:
1. Alpha particles
 2. Bata particles
 3. Gamma rays
 4. Neutrons.

Analyzing the Incident: Predicting the Behavior of a Material and its Container

- OPS-4** Given examples of a single facility and transportation hazardous materials incidents, predict the likely behavior of a material and its container in each incident.
- OPS-4.1** Given situations involving known hazardous materials, interpret the hazard response information obtained from the current edition of the North American Emergency Response Guidebook, MSDS, CHEMTREC and shipper/manufacturer contacts.
- OPS-4.1.1** Match the following chemical and physical properties with their significance and impact on the behavior of the container and/or its contents:
1. Boiling point
 2. Chemical reactivity
 3. Corrosivity (pH)
 4. Flammable (explosive) range (LEL & UEL)

5. Flash point
6. Ignition (autoignition) temperature
7. Physical state (solid, liquid, gas)
8. Specific gravity
9. Toxic products of combustion
10. Vapor density
11. Vapor pressure
12. Water solubility
13. Radiation (ionizing and non-ionizing).

- OPS-4.1.2** Identify the differences among the following terms:
1. Exposure and hazard
 2. Exposure and contamination
 3. Contamination and secondary contamination
 4. Radioactive material exposure.
- OPS-4.2** Identify three types of stress that could cause a container system to release its contents:
1. Mechanical stress
 2. Thermal stress
 3. Chemical stress.
- OPS-4.3** Identify five ways in which containers can breach:
1. Punctures
 2. Splits or tears
 3. Closures opening up
 4. Disintegration
 5. Runaway cracking.
- OPS-4.4** Identify four ways in which containers can release their contents.
1. Catastrophic release or rupture
 2. Detonation
 3. Rapid relief
 4. Spills or leaks.
- OPS-4.5** Identify the general testing requirements for “Type A,” “Type B” and “Special Form” packaging used for radioactive materials transportations.
- OPS-4.6** Identify common “industrial radiography” sources and any specialized large quantity radioactive materials packages commonly transported through the local jurisdiction by their shapes and characteristics.
- OPS-4.7** Identify at least four dispersion patterns that can be created upon release of a hazardous material. The following are examples:
1. Cloud or hemisphere
 2. Plume
 3. Cone
 4. Stream or pooling
 5. Irregular.
- OPS-4.8** Identify the three general time frames for predicting the length of time that exposures may be in contact with the hazardous material in an endangered area to be:
1. Short-term (minutes and hours)

2. Medium-term (days, weeks and months)
3. Long-term (years).

OPS-4.9 Identify the health and physical hazards that could cause harm to include:

1. Thermal
2. Etiologic
3. Asphyxiation
4. Mechanical
5. Corrosive
6. Poisonous
7. Radiation.

OPS-4.9.1 Identify the health hazards associated with the following terms:

1. Asphyxiant - cellular and pulmonary
2. Chronic health hazard
3. Convulsant
4. Irritants and corrosive
5. Sensitizer/allergen
6. Highly Toxic
7. Carcinogens
8. Infectious Agents
9. Systemic toxins
10. Mutagens
11. Teratogens
12. Alpha, beta gamma and neutron radiation.

OPS-4.10 Given the following types of warfare agents, identify the corresponding DOT hazard class and division:

Nerve agents
Vesicants (blister agents)
Blood agents
Choking agents
Irritants (riot control agents)
Biological agents and toxins.

Analyzing the Incident: Estimating the Potential Harm

OPS-5 Given simulated incidents involving hazardous materials, estimate the potential harm within the endangered area at a hazardous materials incident to include:

1. Determining the dimensions of the area
2. Estimating the number of exposures
3. Measuring or predicting concentrations of materials
4. Estimating the physical, health and safety hazards
5. Identifying the areas of potential harm
6. Estimating the potential outcomes.

OPS-5.1 Identify a resource for determining the size of an endangered area surrounding conditions at a hazardous materials incident to include:

1. The current North America Emergency Response Guidebook
2. Facility pre-incident plume dispersion modeling results .

OPS-5.2 Given the dimensions of the endangered area and the surrounding conditions at a hazardous materials incident, estimate the number and type of exposures within that endangered area.

- OPS-5.3** Identify resources available for determining the concentrations of a released hazardous material within an endangered area.
- OPS-5.4** Identify the factors for determining the extent of physical, health, and safety hazards within the endangered area of a hazardous materials incident given the concentration of the released hazardous material.
1. Surrounding conditions
 2. Indication of the behavior of the hazardous material and its container
 3. Degree of hazard.
- OPS-5.5** Describe the impact that time, distance and shielding have on exposure to radioactive materials specific to the expected dose rate.
- OPS-5.6** Describe the prioritization of emergency medical care and removal of victims from the hazard area relative to exposure and contamination concerns.

Planning the Response: Describing Response Objectives for Hazardous Materials Incidents

- OPS-6** Given simulated facility and transportation hazardous materials problems, describe the first responder's response objectives for each problem.
- OPS-6.1** Identify the steps for determining the number of exposures that could be saved by the Firefighter with the resources provided by the authority having jurisdiction and operating in a defensive fashion, given an analysis of the hazardous materials problem and the exposures already lost.
- OPS-6.2** Describe the steps for determining defensive response objective given an analysis of the hazardous materials incident.
- OPS-6.3** Describe how to assess the risk to response personnel for each hazard class in rescuing injured persons at a hazardous materials incident.

Planning the Response: Identifying Defensive Options

- OPS-7** Given simulated facility and transportation hazardous materials problems, identify the defensive options for each response objective.
- OPS-7.1** Identify the defensive options to accomplish a given response objective.
- OPS-7.2** Identify the purpose for, and the procedures, equipment, and safety precautions used with each of the following control techniques:
1. Absorption
 2. Dike, dam, diversion or retention
 3. Dilution
 4. Vapor dispersion
 5. Vapor suppression
 6. Remote valve shutoff.

Planning the Response: Determining Appropriateness of Personal Protective Equipment

- OPS-8** Given the name of a hazardous material involved and the anticipated type of exposure, determine whether available personal protective equipment is appropriate for implementing a defensive option.

- OPS-8.1** Identify the appropriate respiratory protection required for a given defensive option for the first responder at the operational level is positive pressure self-contained breathing apparatus.
- OPS-8.1.1** Identify the three types of respiratory protection and the advantages and limitations presented by the use of each at hazardous materials incidents.
- OPS-8.1.2** Identify the required physical capabilities and limitations of personnel working in positive pressure self-contained breathing apparatus.
- OPS-8.2** Identify the appropriate personal protective equipment required for a given defensive option.
- OPS-8.2.1** Identify skin contact hazards encountered at hazardous materials incidents.
- OPS-8.2.2** Identify the purpose, advantages, and limitations of the following protective clothing at hazardous materials incidents:
1. Structural fire fighting clothing
 2. High temperature protective clothing
 3. Chemical protective clothing
 4. Liquid splash protective clothing
 5. Vapor protective clothing.

Planning the Response: Identifying Emergency Decontamination Procedures

- OPS-9** Given a plan of action for a hazardous materials incident, identify emergency decontamination procedures.
- OPS-9.1** Identify ways that personnel, personal protective equipment, apparatus and tools and equipment become contaminated.
- OPS-9.2** Describe how the potential for secondary contamination determines the need for emergency contamination procedures.
- OPS-9.3** Identify the purpose of emergency decontamination at hazardous materials incidents.
- OPS-9.4** Identify the advantages and limitations of emergency decontamination procedures.
- OPS-9.5** Identify appropriate, simple procedures for dealing with accident victims with life-threatening injuries who are known or suspected to be contaminated with radioactive material.
- OPS-9.6** Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's for decontamination of a large number of people exposed to hazardous materials
- OPS-9.7** Describe the procedure listed in the Local Emergency Response Plan or the organization's SOP's to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Implementing the Planned Response: Establishing and Enforcing Scene Control Procedures

- OPS-10** Given scenarios for facility and/or transportation hazardous materials incidents, identify how to establish and enforce scene control including control zones, emergency decontamination and communications.

- OPS-10.1** Identify the procedures for establishing scene control through control zones.
- OPS-10.2** Identify the criteria for determining the locations of the control zones at hazardous materials incidents.
- OPS-10.3** Identify the basic techniques for the following protective actions at hazardous materials incidents:
 1. Evacuation
 2. Sheltering in-place
- OPS-10.4** Identify the considerations associated with locating emergency decontamination.
- OPS-10.5** Demonstrate the ability to perform emergency decontamination.
- OPS-10.6** Identify the items to be considered in a safety briefing prior to allowing personnel to work at the following:
 1. Hazardous materials incident
 2. Hazardous materials incident with criminal or terrorist activities
- OPS-10.6.1** Identify the items to be considered in a safety briefing prior to allowing for criminal or terrorist related incidents to include:
 1. Secondary events intended to incapacitate or delay emergency responders
 2. Armed resistance
 3. Use of weapons
 4. Booby traps
 5. Secondary contamination from handling patients.

Implementing the Planned Response: Initiating the Incident Management System (IMS)

- OPS-11** Given a simulated facility and/or transportation hazardous materials incidents, initiate the Incident Management System (IMS) specified in the local emergency response plan and the organizations SOP's.
- OPS-11.1** Identify the role of the Firefighter at the operational level during hazardous materials incidents as specified in the local emergency response plan and the organizations SOP's.
- OPS-11.2** Identify the levels of hazardous materials incidents as defined in the SERC Uniform Classification System for Categorizing Hazardous Materials Incidents.
 1. Level 1 – Minor
 2. Level 2 – Moderate
 3. Level 3 – Major
- OPS-11.3** Identify the purpose, need, benefits, and elements of an IMS at hazardous materials incidents.
- OPS-11.4** Identify the considerations for determining the location of the command post for a hazardous materials incident.
- OPS-11.5** Identify the procedures for requesting additional resources at a hazardous materials incident.
- OPS-11.6** Identify the responsibilities of the safety officer as follows:
 1. Obtains a briefing from the Incident Commander

2. Advises the Incident Commander of incident safety considerations and dangerous situations
3. Monitors the implementation of incident safety considerations
4. Alters, suspends or terminates any activity that is deemed to be unsafe.

Implementing the Planned Response: Using Personal Protective Equipment

- OPS-12** equipment Demonstrate the ability to don, work in and doff the personal protective equipment provided by the authority having jurisdiction.
- OPS-12.1** Identify the importance of the buddy system in implementing the planned defensive options.
- OPS-12.2** Identify the importance of the backup personnel in implementing the planned defensive actions.
- OPS-12.3** Identify the safety precautions to be observed when approaching and working at hazardous materials incidents.
- OPS-12.4** Identify the signs and symptoms of heat and cold stress.
- OPS-12.5** Identify the physical capabilities required for and the limitations of personnel working in the personal protective equipment as provided by the authority having jurisdiction.
- OPS-12.6** Match the function of the operational components of the positive pressure self-contained breathing apparatus provided the responder to the name of the component.
- OPS-12.7** Identify the procedures for cleaning, sanitizing and inspecting respiratory protective equipment.
- OPS-12.8** Identify the procedures for donning, working in and doffing positive pressure self-contained breathing apparatus.
- OPS-12.9** Demonstrate donning, working in and doffing positive pressure self-contained breathing apparatus. (Note: Firefighters should have extensive knowledge of the positive pressure self-contained breathing apparatus. This demonstration competency is to identify those individuals who may need additional training in the use of positive pressure SCBA.)

Implementing the Planned Response: Performing Defensive Control Actions

- OPS-13** Given a plan of action for a hazardous materials incident within their capabilities, demonstrate the ability to perform the defensive control actions set out in the plan.
- OPS-13.1** Understand the types of firefighting foam(s) or vapor-suppressing agent(s) and foam equipment furnished by the authority having jurisdiction, understand the proper application of the firefighting foam(s) or vapor-suppressing agents on a spill or fire involving hazardous materials.
- OPS-13.2** Identify the characteristics and applicability of the following types of foams:
1. Protein
 2. Fluoroprotein
 3. Special purpose
 - a. Polar solvent alcohol-resistant concentrates.

- b. Hazardous materials concentrates
- 4. Aqueous film-forming foam (AFFF)
- 5. High expansion.

- OPS-13.3** Given the appropriate tools and equipment, describe how to perform the following defensive control activities:
- 1. Absorption
 - 2. Damming, diking, diversion, and retention
 - 3. Dilution
 - 4. Vapor dispersion
 - 5. Vapor suppression.
- OPS-13.4** Understand the location and use of the mechanical, hydraulic and air emergency remote shut-off devices.
- OPS-13.5** Describe the objectives and dangers of search and rescue missions at hazardous materials incidents.
- OPS-13.6** Describe methods for controlling the spread of radioactive contamination to the limit impact.
- OPS-13.7** Describe procedures, such as those listed in the Local Emergency Response Plan or the organization's SOP's, to preserve evidence at hazardous materials incidents involving suspected criminal or terrorist acts.

Evaluating Progress: Evaluation the Status of Defensive Actions

- OPS-14** evaluate objectives. Given simulated facility and/or transportation hazardous materials incidents, the status of the defensive actions taken in accomplishing the response objectives.
- OPS-14.1** Identify the considerations for evaluating whether defensive options are effective in accomplishing the objectives.
- OPS-14.2** Describe the circumstances under which it would be prudent to withdraw (pull back) from a hazardous materials incident.

Evaluating Progress: Communicating the Status of the Planned Response

- OPS-15** Given simulated facility and/or transportation hazardous materials incidents, demonstrate communicating the status of the planned response to the Incident Commander through the normal chain of command.
- OPS-15.1** Identify the methods for communicating the status of the planned response to the Incident Commander through the normal chain of command.
- OPS-15.2** Identify the methods for immediate notification of the Incident Commander and other response personnel about critical emergency conditions at the incident.

The following training objectives are recommended for Incident Commander. The primary source for this material is National Emergency Training Center (NETC) Guidelines for Public Section Hazardous Materials Training (March 1998). Competencies are included for completeness.

Incident Commander competencies

Recommended Training Objectives

- IC - 1** Given a hazardous materials incident scenario, demonstrate an understanding of the role of the Incident Commander.
- IC - 1.1** Identify the responsibility to analyze a hazardous materials incident to determine the magnitude of the problem in terms of outcomes.
 - IC - 1.1.1** Identify the responsibility to collect and interpret hazard and response information from printed resources, technical resources, computer databases and monitoring equipment.
 - IC - 1.1.2** Identify the responsibility to estimate the potential outcomes within the endangered area at a hazardous materials incident.
- IC - 1.2** Identify the responsibility to plan a response within the capabilities and competencies of available personnel, personnel protective equipment and control equipment.
 - IC - 1.2.1** Identify the response objectives for hazardous materials incidents.
 - IC - 1.2.2** Identify the potential action options (defensive, offensive and nonintervention) available by response objective.
 - IC - 1.2.3** Identify the responsibility to approve the level of personal protective equipment required for a given action option.
 - IC - 1.2.4** Identify the responsibility to develop a plan of action, including safety considerations consistent with the local emergency response plan and the organization's SOP's and within the capability of available personnel, personal protective equipment and control equipment.
- IC - 1.3** Identify the responsibility to implement a response to favorably change the outcomes consistent with the local emergency response plan and the organization's SOP's.
 - IC - 1.3.1** Identify the responsibility to implement an Incident Management System (IMS) including the specified procedures for notification and utilization of non-local resources, e.g., private, state and federal government personnel.
 - IC - 1.3.2** Identify the responsibility to direct resources (private, governmental and others) with expected task assignments and on-scene activities and provide management overview, technical review and logistical support to private and governmental sector personnel.
 - IC - 1.3.3** Identify the responsibility to provide a focal point for information transfer to media and local elected officials through the IMS structure.
- IC - 1.4** Identify the responsibility to evaluate the progress of the planned response to ensure that the response objectives are being met safely, effectively and efficiently and adjust the plan accordingly.
- IC - 1.5** Describe the responsibility to terminate the incident.
 - IC - 1.5.1** Identify the responsibility to transfer command and control when appropriate.
 - IC - 1.5.2** Identify the responsibility to conduct an incident debriefing.

- IC - 1.5.3** Identify the responsibility to conduct a multi-agency critique.
- IC - 1.5.4** Identify the reasonability to report and document the hazardous materials incident and submit the report to the proper entity.

Analyzing the Incident: Collecting and Interpreting Hazard and Response Information

- IC - 2** Given access to printed resources, technical resources, computer data bases and monitoring equipment, collect and interpret hazard and response information not available from the current edition of the *North American Emergency Response Guidebook* or a MSDS.
- IC - 2.1** Identify the types of hazard and response information available from each of the following resources and explain the advantages and disadvantages of each resource:
1. Reference manuals
 2. Hazardous materials data bases
 3. Technical information centers
 4. Technical information specialists
 5. Monitoring equipment.

Analyzing the Incident: Estimating Potential Outcomes

- IC - 3** Given simulated facility or transportation incidents involving hazardous materials, the surrounding conditions and the predicted behavior of the container and its contents, estimate the potential outcomes within the endangered area.
- IC - 3.1** Given dimensions and the surrounding conditions of an endangered area of a hazardous materials incident, identify the steps for estimating the number of exposures within the endangered area.
- IC - 3.2** Match the following toxicological terms and exposure values with their significance in predicting the extent of health hazards in a hazardous materials incident:
1. Immediately Dangerous to Life and Health (IDLH)
 2. Lethal Concentrations (LC50)
 3. Lethal Dose (LD50)
 4. Permissible Exposure Limit (PEL)
 5. Threshold Limit Value Ceiling (TLV-C)
 6. Threshold Limit Value Short-term Exposure Limit (TLV-STEL)
 7. Threshold Limit Value Time-weighted Average (TLV-TWA)
 8. Parts per million (ppm), parts per billion (ppb)
 9. Emergency Response Planning Guide (ERPG)
 10. RAD, Millirem, Roentgen Equivalent Man (REM) and Roentgen.
- IC - 3.3** Match the following terms associated with radioactive materials with their significance in predicting the extent of health hazards in a hazardous materials incident:
1. Alpha radiation
 2. Beta radiation
 3. Gamma radiation
 4. Half-life
 5. Protective actions (time, distance, and shielding).
- IC - 3.4** Describe the health risks associated with the following:
1. Nerve agents (Sarin, Soman and Tabun)
 2. Vesicants agents (blister agents as Mustard and Lewsite)
 3. Blood agents

4. Choking agents
5. Biological agents (bacteria, viruses and toxins)
6. Irritants (riot control agents).

IC - 3.5 Identify the methods for predicting the areas of potential harm within the endangered area of a hazardous materials incident.

IC - 3.6 Identify the methods available to the organization for obtaining local weather conditions and predictions for short-term future weather changes.

IC - 3.7 Explain the basic toxicological principles relative to assessment and treatment of personnel exposed to hazardous materials, including the following:

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

Planning the Response: Identifying Response Objectives

IC - 4 Given simulated facility and transportation hazardous materials incidents, the Incident Commander will describe the possible action options by response objectives for each problem.

IC - 4.1 Describe the steps for determining response objectives (defensive, offensive and nonintervention) given an analysis of a hazardous materials incident.

Planning the Response: Identifying the Potential Action Options

IC - 5 Given simulated facility and transportation hazardous materials incidents, identify the possible action options (defensive, offensive and nonintervention) by response objective for each problem.

IC - 5.1 Identify the possible action options to accomplish a given response objective.

IC - 5.2 Identify the purpose of each of the following techniques for hazardous materials control:

1. Absorption
2. Neutralization
3. Overpacking
4. Patching
5. Plugging.

Planning the Response: Approving the Level of Personal Protective Equipment

IC - 6 Given situations with known and unknown hazardous materials, approve the appropriate personal protective equipment for the action options specified in the plan of action in each situation.

IC - 6.1 Identify the four levels of chemical protection (EPA/NIOSH) and match the equipment required for each level with the conditions under which each level is used:

1. Level A
2. Level B

3. Level C
4. Level D.

- IC - 6.2** Describe the following terms and explain their impact and significance on the selection of chemical-protective clothing:
1. Degradation
 2. Penetration
 3. Permeation.
- IC - 6.3** Describe the three safety considerations for personnel wearing vapor-protective, liquid splash-protective and high temperature-protective clothing.
- IC - 6.4** Identify the physiological and psychological stresses that can affect users of personal protective clothing.
- IC - 6.5** Identify the limitations of military chemical/biological protective clothing.

Planning the Response: Developing a Plan of Action

- IC - 7** Given simulated facility and transportation hazardous materials incidents, develop a plan of action consistent with the local emergency response plan and the organization's SOP's that is within the capability of the available personnel, personal protective equipment and control equipment.
- IC - 7.1** Identify the steps for developing a plan of action.
- IC - 7.2** Identify the factors to be evaluated in selecting public protective actions including evacuation and in-place protection.
- IC - 7.3** Given the local emergency response plan or the organization's SOP's, identify which agency will:
1. Receive the initial notification
 2. Provide secondary notification and activation of response agencies
 3. Make on-going 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 in-place protection)
 9. Provide fire suppression services when appropriate
 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 on-scene decontamination when appropriate
 15. Provide operational-level hazard control services
 16. Provide technician-level hazard mitigation services
 17. Coordinate environmental remedial action ("cleanup") services
 18. Provide environmental monitoring

19. Implement on-scene personnel accountability
20. Provide for on-scene responder identification
21. Provide for command post security
22. Provide for crime scene investigation
23. Provide for evidence collection and sampling.

- IC - 7.4** Identify the process for determining the effectiveness of an action option on the potential outcomes.
- IC - 7.5** Identify the safe operating practices/procedures that are required to be followed at a hazardous materials incident.
- IC - 7.5.1** Identify the importance of pre-incident planning relating to safety during responses to specific sites.
- IC - 7.5.2** Identify the procedures for presenting a safety briefing prior to allowing personnel to work on a hazardous materials incident.
- IC - 7.5.3** Identify at least three safety precautions associated with search and rescue missions at hazardous materials incidents.
1. Buddy systems
 2. Backup team
 3. Personal protective equipment.
- IC - 7.5.4** Identify the advantages and limitations and describe an example where each of the following decontamination methods would be used:
1. Absorption
 2. Adsorption
 3. Chemical degradation
 4. Dilution
 5. Disposal
 6. Evaporation
 7. Neutralization
 8. Solidification
 9. Vacuuming
 10. Washing.
- IC - 7.5.5** Identify the atmospheric and physical safety hazards associated with hazardous materials incidents involving confined spaces.
- Atmospheric hazards
1. Oxygen-deficient atmosphere
 2. Oxygen-enriched atmosphere
 3. Flammable/explosive atmosphere
 4. Toxic atmosphere
- Physical hazards
1. Engulfment hazards
 2. Slips and falls
 3. Electrical hazards
 4. Structural hazards
 5. Mechanical hazards.

Implementing the Planned Response: Implementing the Incident Management System

- IC - 8** Given a copy of the local emergency response plan, identify the requirements of the plan for managing an incident utilizing a Unified Command Structure and the procedures for

notification and utilization of non-local resources (private, state and federal government personnel).

- IC - 8.1** Identify the role of the Incident Commander during an incident involving hazardous materials.
- IC - 8.2** Identify the duties and responsibilities of the following hazardous materials branch functions within the incident management system:
1. Backup Team
 2. Decontamination
 3. Entry
 4. HazMat Branch Management
 5. Haz Mat Branch Safety
 6. Research/Information
 7. Reconnaissance
 8. Resources
- IC - 8.3** Identify the steps for implementing the local and related emergency response plans as required under SARA Title III Section 303 of the federal regulations or other local emergency response planning legislation.
- IC - 8.4** Given the local emergency response planning documents, identify the elements of each of the documents.
- IC - 8.5** Identify the elements of the incident management system necessary to coordinate response activities at hazardous materials incidents and the Incident Commander's responsibilities for establishing the appropriate incident organizational structure.
- IC - 8.6** 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, use of hazardous materials, disposal of hazardous wastes and the governmental regulations and procedures for funding cleanup and mechanisms for cost recovery.
- IC - 8.7** Identify the governmental agencies and private sector resources offering assistance during a hazardous materials incident, and identify their role and the type of assistance or resources available.
- IC - 8.8** Develop a plan of action to effectively deal with a hazardous materials incident, obtaining the necessary resources, coordinating and directing the plan of action, the procedures for the recovery, cleanup and removal of any hazardous wastes.
- IC - 8.9** Identify the process and procedures for obtaining cleanup and restoration of services in the local emergency response plan or organization's SOP's.

Implementing the Planned Response: Directing Resources (Private and Governmental)

- IC - 9** Given a simulated hazardous materials incident and the necessary resources to implement the planned response, demonstrate the ability to direct the resources in a safe and efficient manner consistent with the capabilities of those resources.
1. Identify task assignment (based upon strategic and tactical operations)
 2. Identify operational safety
 3. Identify operational effectiveness
 4. Identify planning support
 5. Identify logistical support

6. Identify administrative support.

Implementing the Planned Response: Providing a Focal Point for Information Transfer to Media and Elected Officials

- IC - 10** Given a simulated hazardous materials incident, identify appropriate information to provide to the media and federal, State and local officials.
- IC - 10.1** Identify the local policy for providing information to the media.
- IC - 10.2** Identify the responsibilities of the public information officer at a hazardous materials incident.

Evaluating Progress: Evaluating Progress of the Plan of Action

- IC - 11** Given simulated facility and transportation hazardous materials incidents, evaluate the progress of the plan of action to determine whether the efforts are accomplishing the response objectives.
- IC - 11.1** Identify the procedures for evaluating whether the action options are effective in accomplishing the response objectives.
- IC - 11.2** Identify the steps for comparing actual behavior of the material and the container to that predicted in the analysis process.
- IC - 11.3** Given a simulated hazardous materials incident, determine the effectiveness of:
1. Personnel being used
 2. Personal protective equipment
 3. Established control zones
 4. Decontamination process.

Terminating the Incident: Transferring Command/Control

- IC - 12** Given the details of a simulated incident, the local emergency response plan and the organizations SOP's demonstrate the ability to effectively transfer command.
- IC - 12.1** Identify the appropriate steps to be taken to transfer command/control of the incident.
- IC - 12.2** Demonstrate the transfer of command/control.
- IC – 12.2.1** Brief incoming Incident Commander.
- IC – 12.2.2** Communicate the transfer to involved agencies.
- IC - 12.3** Given a hazardous materials incident, terminate the emergency phase of the incident.
- IC – 12.4** Identify the steps required in terminating the emergency phase of a hazardous materials incident.
- IC – 12.5** Identify the steps in transferring authority as prescribed in the local emergency response plan or the organization's SOP's.

Terminating the Incident: Conducting a Debriefing

- IC - 13 Given the details of a simulated multi-agency hazardous materials incident, conduct a critique of the incident.
- IC - 13.1 Describe three components of an effective debriefing.
- IC - 13.2 Describe the key topics in an effective debriefing.
- IC - 13.3 Describe when a debriefing should take place.
- IC - 13.4 Describe who should be involved in a debriefing.
- IC - 13.5 Identify the procedure for conducting debriefings at a hazardous materials incident.

Terminating the Incident: Conducting a Multi-Agency Critique

- IC – 14 Given a simulated multi-agency hazardous materials incident, demonstrate the ability to conduct a critique of the incident.
- IC – 14.1 Describe three components of an effective critique.
- IC – 14.2 Describe who should be involved in a critique.
- IC – 14.3 Describe why an effective critique is necessary after a hazardous materials incident.
- IC – 14.4 Describe what written documents should be prepared as a result of the critique.
- IC – 14.5 Implement the procedure for conducting a critique of the incident.

Terminating the Incident: Reporting and Documenting the Hazardous Materials Incident

- IC – 15 Given a simulated hazardous materials incident, demonstrate the ability to report and document the incident consistent with the local, state and federal requirements.
- IC - 15.1 Identify the reporting requirements of local, state and federal agencies.
- IC - 15.2 Identify the importance of documentation for a hazardous materials incident including training records, exposure records, incident reports and critique reports.
- IC - 15.3 Identify the steps in keeping an activity log and exposure records for hazardous materials incidents.
- IC - 15.4 Identify the requirements for compiling hazardous materials incident reports found in the local emergency response plan and the organization's SOP's.
- IC - 15.5 Identify the requirements for filing documents and maintaining records found in the local emergency response plan and the organization's SOP's.
- IC - 15.6 Identify the procedures required for legal documentation and chain of custody/continuity described in the organization's SOP's or the local emergency operating plan.

Summary: Incident Commander

OSHA minimum requirement = 24 hours Operational level training + Incident Commander training.

Audience

Moderate in size. Responders whose level of command responsibility may include Incident Commander at all phases of a HAZMAT incident, from initial response through stabilization to incident termination.

Prerequisites

1. First Responder Awareness training.
2. First Responder Operations training (minimum 24 hours required).

Training

- ◆ First Responder Operational level plus 24 hours.
- ◆ Classroom and simulator/field instruction, with emphasis on incident management and resource coordination.
- ◆ Competencies:
 1. Knowledge of role of incident commander within Incident Command System and responsibilities within employer's emergency response plan.
 2. Knowledge of State and federal emergency response plans.
 3. 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.
 4. Ability to implement transfer of command and incident termination procedures.

Refresher Training

To occur annually:

1. Review of command structure SOP's.
2. Information updates on local, State and federal response plans.
3. Refresher practice incident scene management, coordination and decision-making using simulated emergencies.

FLORIDA STATE EMERGENCY RESPONSE COMMISSION

***Guidelines for Instructor Qualifications
of
Hazardous Materials Trainers***

October 1, 2002
~Revised~



Guidelines for Instructor Qualifications of Hazardous Materials Trainers

Instructor Qualifications

OSHA 1910.120(q)(7) states: "Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the U.S. National Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach."

To implement the OSHA regulations and to encourage quality instruction, it is recommended that ideally instructors possess the following:

- ◆ **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 (Reference: NFPA 1041), and oral and written communication skills
- ◆ **Personal qualities**—patience and understanding, enjoyment of and respect for students and flexibility.
- ◆ **Sensitivity** to cultural diversity among students.

Several organizations certify hazardous materials instructors. Professional organizations, such as NFPA, have established professional standards for instructors (NFPA 1041) that can be used to evaluate instructor training and certification. Employers and trainers should carefully examine the following criteria for certification of hazardous materials instructors.

- ◆ What standards have been applied?
- ◆ Are potential instructors tested in their area of subject matter expertise?
- ◆ Are candidates required to demonstrate their skills and knowledge in the classroom setting?
- ◆ Are there follow-up evaluations or recertification requirements?
- ◆ Are both instructional and technical skills addressed by certification?
- ◆ Is hands-on experience in hazardous materials response considered?
- ◆ Have the instructors performed the tasks being taught?

It is recommended that the individual delivering First Responder Programs demonstrate competency at least one level above the planned training program delivery. For instance, an instructor delivering a First Responder Awareness Program should be competent at the First Responder Operational level or above. The instructor should also be competent in adult instructional techniques. When selecting instructors for the technician and Incident Commander levels the material becomes increasingly more technical and decision oriented. It is imperative that instructors have the job experience and presentation skills necessary to successfully deliver the selected program. Train the trainer programs provide the opportunity for existing instructors to become familiar with a program and instructional techniques associated with the program delivery.

Federal Requirements For First Responder Awareness Training

OSHA establishes the following training requirements for first responders at the awareness level. Length of training and method of testing are not specified, but employers are required to ensure the employees demonstrate competency in the skills defined.

OSHA 29 CFR 1910.120(q)(6)(i)
FIRST RESPONDER AWARENESS LEVEL

First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

- (A) An understanding of what hazardous substances are and the risks associated with them in an incident.
- (B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- (C) The ability to recognize the presence of hazardous substances in an emergency.
- (D) The ability to identify the hazardous substance, if possible
- (E) An understanding of the role 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.
- (F) The ability to realize the need for additional resources, and to make appropriate notifications to the communications center.

Required Training can be translated directly into the following six sample principal objectives.

Required Training Objectives

1. Define the different types of hazardous substances and identify the risks associated with them in an incident.
2. Given a simulated incident involving hazardous materials, identify the potential outcomes.
3. Given the data available during an incident response, demonstrate recognition of the presence of hazardous substances.
4. Given the data available during an incident response, identify hazardous substances present.
5. Define the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the North American Emergency Response Guidebook.
6. Given a simulated incident, determine the need for additional resources, and make appropriate notifications to the communication center.

Federal Requirements For First Responder Operations Training

OSHA establishes the following training requirements for first responders at the operations level: a minimum of 8 hours of training beyond the awareness level or, as an alternative, certification of sufficient experience. Training in excess of 8 hours may be necessary, especially for additional skills and knowledge such as for flammable gas firefighting. Employers are required to ensure that employees demonstrate competency in the skills defined.

OSHA 29 CFR 1910.120(q)(6)(ii)
FIRST RESPONDER OPERATIONS LEVEL

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least 8 hours of training or have had sufficient experience to objectively demonstrate competency in the following areas, in addition to those listed for the awareness level and the employer shall so certify:

- (A) Knowledge of the basic hazard and risk assessment techniques.
- (B) Know how to select and use proper personal protective equipment provided to the first responder operational level.
- (C) An understanding of basic hazardous materials terms.
- (D) 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.
- (E) Know how to implement basic decontamination procedures.
- (F) An understanding of the relevant standard operating procedures and termination procedures.

Required Training can be translated into the following six sample principal objectives.

Required Training Objectives

1. Given a simulated incident involving hazardous materials, demonstrate knowledge of basic hazard and risk assessment techniques.
2. Given a simulated incident involving hazardous materials, select and demonstrate correct use of proper personal protective equipment.
3. Define basic hazardous materials terms.
4. Given a simulated incident involving hazardous materials, describe basic control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available within the student's unit.
5. Given a simulated incident involving hazardous materials, list and define appropriate basic decontamination procedures.
6. Given a simulated incident involving hazardous materials, identify relevant SOP's and termination procedures.

Federal Requirements For Hazardous Materials Technician Training

OSHA establishes the following training requirements for hazardous materials technicians. Methods of testing are not specified. Technicians shall have awareness training and operations training (for a minimum of 24 hours) and training at the technician level. Employers are required to ensure that employees demonstrate competency in the skills defined.

OSHA CFR 1910.120 (q)(6)(iii)
HAZARDOUS MATERIALS TECHNICIAN

Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch, or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following area and the employer shall so certify:

- (A) Know how to implement the employer's emergency response plan.
- (B) Know the classification, identification and verification of known and unknown materials by using field survey instruments and equipment.
- (C) Be able to function within an assigned role in the Incident Command System.
- (D) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.
- (E) Understand hazard and risk assessment techniques.
- (F) Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit.
- (G) Understand and implement decontamination procedures.
- (H) Understand termination procedures.
- (I) Understand basic chemical and toxicological terminology and behavior.

OSHA 29 CFR 1910.120(q)(10)

- (10) Chemical protective clothing. Chemical protective clothing and equipment to be used by organized and designated HAZMAT team members, or to be used by hazardous materials specialists, shall meet the requirements of paragraphs (g)(3) through (5) of this section.

Required Training is specified in the OSHA regulations listed above. For the convenience of course assessment, the requirements are translated directly into the following nine sample principal objectives.

Required Training Objectives

1. Given a simulated incident involving hazardous materials, demonstrate implementation of the employer's emergency response plan.
2. Using field survey instruments and equipment, classify, identify, and verify known and unknown hazardous materials.
3. Given a simulated incident involving hazardous materials, demonstrate functioning within an assigned role in the incident command system.
4. Given a simulated incident involving hazardous materials, select and demonstrate use of proper specialized chemical personal protective equipment provided to the HAZMAT Technician.
5. Identify hazard and risk assessment techniques.
6. Given simulated incidents involving different hazardous materials containers and released, demonstrate advanced control, containment and/or confinement operations.
7. Given a simulated incident involving hazardous materials, identify and demonstrate decontamination procedures.
8. List and describe hazardous materials incidents termination procedures.

9. Define basic chemical and toxicological terms and describe basic chemical and toxicological behavior.

Federal Requirements For Incident Commander Training

OSHA establishes the following training requirements for incident commanders: a minimum of 24 hours of training at the first responder operations level plus training to the competencies described below or certification of sufficient experience as an alternative. Employers are required to ensure that employees demonstrate competency in the skills defined.

OSHA 29 CFR 1910.120(q)(6)(v)

ON-SCENE INCIDENT COMMANDER

Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify.

- (A) Know and be able to implement the employers incident command system.
- (B) Know how to implement the employer's emergency response plan.
- (C) Know and understand the hazards and risks associated with employees working in chemical protective clothing.
- (D) Know how to implement the local emergency response plan.
- (E) Know of the state emergency response plan and of the Federal Regional Response Team.
- (F) Know and understand the importance of decontamination procedures.

The following are additional OSHA requirements that must be reflected in the development of training objectives.

OSHA 29 CFR 1910.120(q)(3)(i-ix)

- (i) The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.

Note to (q)(3)(i)- The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first- due piece of responding emergency apparatus to arrive on the incident scene. As more senior officials arrive (i.e., battalion chief, fire chief, State law enforcement official, state coordinator, etc.) the position is passed up the line of authority, which has been previously established.

- (ii) The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present and shall address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies.
- (iii) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations., and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum, the criteria contained in 29 CFR 1910.156(e) when worn while performing fire fighting operations beyond the incipient stage for any incident.
- (iv) Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus while engaged in the emergency response, until such time that the individual in charge of

the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.

- (v) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site, in those areas of potential or actual exposure to the incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.
- (vi) Back-up personnel shall stand by with equipment ready to provide assistance or rescue. Qualified basic life support personnel, as a minimum, shall also be standing by with medical equipment and transportation capability.
- (vii) The individual in charge of the ICS shall designate a safety officer, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.
- (viii) When activities are judged by the safety officer to be an IDLH and/or involve an imminent danger condition, the safety officer shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any action needed to be taken to correct these hazards at the emergency scene.
- (ix) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

See also OSHA 29 CFR 1910.120 Appendix C, Compliance Guidelines (6) in ICS and (7) Site Safety and Control Plans.

The safety and security of response personnel and others in the area of an emergency response incident site should be of primary concern of the incident commander. The use of a site safety and control plan could greatly assist those in charge of assuring the safety and health of employees on the site.

A comprehensive site safety and control plan should include the following: summary analysis of hazards on the site and risk analysis of those hazards; site map or sketch; site work zones (clean zone transition or decontamination zone, work or hot zone); use of the buddy system; site communications; command post or command center; standard operating procedures and safe work practices; medical assistance and triage area; hazard monitoring plan (air contamination monitoring, etc.); decontamination procedures and area; and other relevant areas. This plan should be part of the employer's emergency response plan or an extension of it to the specific site.

Required Training can be translated directly into the following fourteen sample objectives:

Required Training Objectives

1. Given a simulated incident involving hazardous materials, demonstrate implementation of the employer's incident command system.
2. Demonstrate establishing command, organizing resources and assigning subordinate units and personnel, and establishing lines of communication. OSHA 29 CFR 1910.120(q)(3)(i)
3. Demonstrate transfer of command. OSHA 29 CFR 1910.120(q)(3)(i)
4. Define the roles and responsibilities of the safety officer. OSHA 29 CFR 1910.120(q)(3)(vii and viii)
5. Given a simulated incident involving hazardous materials, demonstrate implementation of the employer's emergency response plan.

6. Identify all hazardous substances or conditions present and describe as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies. OSHA 29 CFR 1910.120(q)(3)(ii)
7. Determine and describe appropriate emergency operations, including correct use of personal protective equipment, based on the hazardous substance and/or conditions present. OSHA 29 CFR 1910.120(q)(3)(iii)
8. Given a simulated incident involving hazardous materials, identify the hazards and risks associated with employees working in chemical protective clothing.
9. Identify the process to determine, through the use of air monitoring, when it is safe for subordinate personnel to discontinue use of positive pressure self-contained breathing apparatus. OSHA 29 CFR 1910.120(q)(3)(iv)
10. Identify strategies and tactics to minimize the number of emergency response personnel working in areas of potential or actual exposure to incident or site hazards, while using the buddy system in groups of two or more. OSHA 29 CFR 1910.120(q)(3)(v)
11. Identify requirements for backup assistance and rescue personnel and qualified basic life support personnel, equipment, and transportation capability. OSHA 29 CFR 1910.120(q)(3)(vi)
12. Given a simulated incident involving hazardous materials, demonstrate implementation of the local emergency response plan.
13. Identify and describe the State emergency response plan and the federal regional response team.
14. Given a simulated incident involving hazardous materials, identify and demonstrate management of decontamination procedures.