

	Pennsylvania State Fire Academy	
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Minimum Standard for Accreditation (MSA)		

Date: June 1, 2016
Last Revision: -----, ----

Course Title: Hazardous Materials Operations

SFA Course Code: HMOJB

Course Length: 24.0 Hours

Lecture/Lab Breakdown: 12/12

Prerequisites: None

Referenced Text(s): *Jones and Bartlett: Hazardous Materials Awareness & Operations*, First or Second Edition, **DOT Emergency Response Guide**, Current Edition. OSHA 29 CFR 1910.120; DOT 49 CFR 171-173; NFPA 471; NFPA 472; *NIOSH Pocket Guide to Chemical Hazards*, latest edition,

Course Goal: The goal of this program is to provide the emergency responder with the training needed to comply with First Responder Operations Level training identified in the NFPA 472 Core Competencies and in the Hazardous Materials Waste Operations and Emergency Response (HAZWOPER) regulations. In addition, this program will provide the emergency responder with skills needed to comply with NFPA 472 Chapter 6.2 Mission Specific Personal Protective Equipment for the First Responder and Chapter 6.1 Mission Specific Product Control for the First Responder at the Operational Level.

Course Description: Provide training for first responders that respond to releases or potential releases of hazardous substances as part of the initial response for the purpose of protecting nearby persons, property and the environment. Personnel are trained to respond in a defensive fashion to contain the release from a safe distance, to keep it from spreading and prevent exposures. They must understand basic hazard and risk assessment, how to select and use proper personnel protective equipment, basic hazardous materials terms, basic control, containment and/or confinement operations within the capabilities of the resources and PPE available, basic decontamination procedures and termination procedures.

Description of Methodology: The methodology for this course consists of lecture, discussion, demonstration, and supervised practice.

Student Equipment & Supplies: Pen/pencil & notebook, Personal Protective Equipment and Respiratory Protection as issued by the Authority Having Jurisdiction (AHJ). See Hazardous Materials Training Curriculum Policy 2016-01 for additional information. The PSFA Facial Hair Policy will be enforced for those using respiratory protection.

Equipment/Audiovisual/Facility/Supply Requirements:

1. Classroom set up with usual amenities; computer and computer projection equipment with screen/monitor; Audio Visuals for the course.
2. Instructor Guide and PowerPoint Presentation.
3. Student Manual for each student (Required).
4. ERG (latest edition) for each student.
5. Skill Sheets and Handouts

Special Notes & Conditions: Instructor Requirements: an accredited PA State Fire Academy Local Level Instructor trained in hazardous materials and nationally certified by IFSAC or Pro-Board Hazardous Material Operations level. Class Size Maximum: 30 students. Student minimum age: 16.

Competency Evaluation Mechanism: 100% Class Attendance and participation in all practical skills evolutions.

Training Session Outline

<u>Elapsed Time</u>	<u>Topic</u>
	Introduction
1.50	Chapter 1 Hazardous Materials Overview
3.00	Chapter 2 Hazardous Materials: Properties and Effects
5.00	Chapter 3 Recognizing and Identifying the Hazards
2.00	Chapter 4 Estimating Potential Harm and Planning a Response
2.50	Chapter 5 Implementing the Planned Response
2.00	Chapter 8 Personal Protective Equipment
6.00	Chapter 12 Product Control
2.00	Summary and Course Evaluation

24.00 Hours Total Time

Core Learning Outcomes (Behavioral Objectives):

Chapters 1 – 5 - This student will:

- Define a hazardous material.
- Define weapons of mass destruction (WMD).
- Describe the levels of hazardous materials training: Awareness, operations, technician, specialist, and incident commander.
- Explain the differences between standards and federal regulations that govern hazardous materials response activities.

- Explain why hazardous materials incidents differ from other types of emergencies.
- Explain the need for a planned response to a hazardous materials incident.
- Describe the following properties:
 - Boiling point, Chemical reactivity, Corrosivity (pH), Flammable (explosive) range [lower explosive limit (LEL) and upper explosive limit (UEL)], Flash point, Ignition (auto ignition) temperature, Particle size, Persistence, Physical state (solid, liquid, gas), Radiation (ionizing and non-ionizing), Specific gravity, Toxic products of combustion, Vapor density, Vapor pressure, Water solubility, Physical change and chemical change
- Describe radiation (non-ionizing and ionizing) as well as the differences between alpha, beta, gamma, and neutron.
- Describe the differences between the following pairs of terms:
 - Contamination and secondary contamination, Exposure and contamination, Exposure and hazard, Infectious and contagious, Acute and chronic effects, Acute and chronic exposures
- Describe the following types of weapons of mass destruction:
 - Nerve agents, Blister agents, Choking agents, Irritants
- Describe the routes of exposure to hazardous materials for humans.
- Describe occupancies that may contain hazardous materials.
- Describe how to utilize senses to detect the presence of hazardous materials, as well as, the limitations regarding their use.
- Describe specific container shapes/types that may indicate the presence of hazardous materials.
- Describe occupancies that may contain hazardous materials.
- Describe how to identify and understand the warnings associated with placards, labels, and markings.
- Describe the NFPA 704 hazard identification marking system.
- Demonstrate the use the *Emergency Response Guidebook (ERG)*.
- Describe the use of Safety Data Sheets (SDS) and shipping papers.
- Describe CHEMTREC and the National Response Center.
- Describe how to identify criminal or terrorist activity involving chemical, biological, or radiological agents.
- Describe how to identify an illicit laboratory, as well as explosive and secondary devices.
- Estimate the potential harm or severity of a hazardous materials/WMD incident.
- Use various resource types to determine the size of an incident.

- Describe the differences between exposure and contamination and how to protect yourself from each.
- Report the size and scope of an incident
- Use available resources to determine the concentration of a hazardous material.
- Identify skin contact hazards.
- Describe how to plan an initial response.
- Describe the potential for secondary attacks/devices.
- Select appropriate PPE for hazardous materials/WMD incidents.
- Identify purpose, advantages, and limitations of:
 - Street clothing and work uniforms,
 - Structural firefighting protective clothing
 - High temperature–protective clothing and equipment
 - Chemical-protective clothing and equipment
- Identify respiratory protection needs.
- Describe the PPE levels used for hazardous materials/WMD incidents.
- Describe physical capabilities required and limitations of personnel working in PPE.
- Describe the importance of having a plan in place to decontaminate a victim.
- Demonstrate how to perform emergency decontamination of a victim.
- Describe how to notify proper authorities and request additional resources.
- Describe procedures for requesting additional resources.
- Describe scene control procedures using control zones.
- Demonstrate how to establish control zones and implement the incident command system.
- Describe appropriate locations for control zones and incident command posts.
- Describe effective coordinated communication techniques.
- Describe evidence preservation strategies.
- Describe the roles of the operations level responder, the incident safety officer, and a hazardous materials branch or group, at a hazardous materials incident.
- Describe levels of hazardous materials incidents.
- Describe the incident command system.
- Describe the importance of the buddy system and backup personnel.
- Describe protective actions during search and rescue, evacuation, and sheltering-in-place.
- Describe safety precautions to be observed when approaching or working in a hazardous materials environment.
 - Safety briefings, Physical capability requirements
- Describe evaluation and communication of the status of the response.

Chapter 8 – PPE – The student will:

- Describe personal protective equipment (PPE) for hazardous materials incidents.
- Describe the capabilities of the PPE provided by the authority having jurisdiction (AHJ) so as to perform any mission-specific tasks assigned.
- Describe how to don, work in, and doff the PPE provided by the AHJ.
- Describe PPE performance requirements.
- Describe ways to ensure that personnel do not go beyond their level of training and equipment.
- Describe cooling technologies.
- Terminate the incident by completing the reports and documentation pertaining to PPE.
- Demonstrate the ability to properly don and doff their Personal Protective Equipment.

Chapter 12 – Product Control – The student will:

- Describe and identify the control options available to operations level responders.
- Describe and identify the control options available for flammable liquid and flammable gas incidents.
- Describe purpose, equipment, and precautions associated with control options.
- Describe the applicability and characteristics of aqueous film-forming foam, alcohol-resistant concentrates, fluoroprotein foams, protein foams, and high-expansion foams.
- Identify the location and describe the use of emergency remote shut-off devices on MC/DOT-306/406, MC/DOT-307/407, and MC-331 cargo tanks containing flammable liquids or gases.
- Describe the recovery phase and the transition from emergency to clean-up.
- Demonstrate how to perform the following control activities:
 - Absorption, Damming, Diking , Retention , Vapor Dispersion, Vapor Suppression

Questions/Comments: Please contact the State Fire Academy Assistant Administrator