State of Oregon
Department of Public Safety Standards and Training

# NFPA 472 Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction HAZARDOUS MATERIALS TECHNICIAN

Task Book

| Task Book Assigned To: | |
|---|---|
| Name | DPSST Fire Service # |
| Agency Name | Date Initiated |
| Signature of Agency Head or Training Officer | Date Completed |



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Additional copies of this document may be downloaded from the DPSST web site:
**http://oregon.gov/DPSST/FC/index.shtml**

NEW 1/2010

Task Book Qualification Record Books (Task Book) have been developed for various certification levels within the Oregon Department of Public Safety Standards and Training (DPSST) system. Each Task Book lists the job performance requirements (JPRs) for the specific certification level in a format that allows a candidate to be trained and evaluated during three (3) sequential sessions. Successful performance of all tasks, as observed and recorded by a qualified and approved evaluator will result in the candidate's eligibility for DPSST certification.

To become certified at a specific level, the applicant must successfully complete the job performance requirements in sequence. Before a job performance evaluation can be taken, all requisite knowledge and skills must be satisfied. In addition, all relative task book evaluations must be checked off by the evaluator. When all prescribed requirements have been met, an application for Certification will be forwarded to DPSST. All certificates are mailed to the Training Officer at his/her Fire Service Agency.

**NOTE TO FIRE SERVICE AGENCIES:** These JPRs serve as general guidelines. As such they are not intended to replace specific sequences of apparatus or equipment operation that may be outlined by manufacturer specifications. At all times, standard operating procedures of the Fire Service Agency in which the evaluation is being conducted will govern. Fire Service Agencies should have available for evaluators a copy of manufacturer specifications and the Fire Service Agencies standard operational guidelines.

The JPRs covered in this Task Book meet or exceed all NFPA published standards for this certification level at the time of this publication. Mention of NFPA and its standards do not, and are not intended as adoption of—or reference to—NFPA standards. For more information on the complete job performance requirements and data, see the individual DPSST Task Book for that certification level.

**Oregon Administrative Rule 259-009-0062**

**Fire Service Personnel Certification**

(D) Task books must be monitored by a Field Training Officer approved by the Department. The Field Training Officer must be certified at or above the level being monitored and have at least five (5) years inspection experience. The Department may approve other Field Training Officers with equivalent training, education and experience as determined by designated Department staff.

**HOW TO EVALUATE PERFORMANCE:**

Each JPR has one corresponding box to the right in which to confirm a candidate's success. The evaluator shall indicate successful passing by the candidate of each JPR by initialing and dating (see example).

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

# TASK BOOK QUALIFICATION RECORD

FOR THE CERTIFICATION LEVEL OF

# HAZARDOUS MATERIALS TECHNICIAN

Prior to becoming certified in this position, the NFPA 472 Hazardous Materials Technician candidate must successfully complete the following Job Performance Requirements (JPR) or competencies. The evaluator shall initial and date the appropriate box to indicate successful completion. For each JPR or competency, there are requisite knowledge and skill requirements. The evaluator must initial and date in the box provided to indicate the meeting of those requirements before the candidate may proceed.

**Goals and Expectations**

The goal of the competencies at this level shall be to provide the Hazardous Materials Technician with the knowledge and skills to analyze a hazardous materials/WMD incident, select appropriate procedures, equipment and to ensure that such tasks are performed in a competent and safe manner.

When responding to hazardous materials/WMD incidents, the hazardous materials technician shall be able to perform the following tasks safely and effectively:

**7.1 General.**

**7.1.1.1** The hazardous materials technician shall be that person who responds to hazardous materials/WMD incidents using a risk-based response process by which he or she analyzes a problem involving hazardous materials/WMD, selects applicable decontamination procedures, and controls a release using specialized protective clothing and control equipment [see 7.1.2.2(1)]. ☐

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

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

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

**7.1.2 Goal.**

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

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

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

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

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

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

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

(e) Estimate the size of an endangered area using computer modeling, monitoring equipment, or specialists in this field. ☐

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

(a) Describe the response objectives for hazardous materials/WMD incidents. ☐

(b) Describe the potential response options available by response objective. ☐

(c) Select the personal protective equipment required for a given action option. ☐

(d) Select a technical decontamination process to minimize the hazard. ☐

(e) Develop an incident action plan for a hazardous materials/WMD incident, including a site safety and control plan, consistent with the emergency response plan or standard operating procedures and within the capability of the available personnel, personal protective equipment, and control equipment. ☐

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

(a) Perform the duties of an assigned hazardous materials branch or group position within the local incident management system (IMS). ☐

(b) Don, work in, and doff personal protective clothing, including, but not limited to, both liquid splash– and vapor–protective clothing with correct respiratory protection. ☐

(c) Perform the control functions identified in the incident action plan. ☐

(d) Perform the decontamination functions identified in the incident action plan. ☐

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

(a) Evaluate the effectiveness of the control functions. ☐

(b) Evaluate the effectiveness of the decontamination process. ☐

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

(a) Assist in the incident debriefing. ☐

(b) Assist in the incident critique. ☐

(c) Provide reports and documentation of the incident. ☐

**7.2 Competencies — Analyzing the Incident.**

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

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

**7.2.1.1.1** Given examples of the following railroad cars, the hazardous materials technician shall identify the container by name and specification and identify the typical contents by name and hazard class: ☐
(1) Cryogenic liquid tank cars
(2) Nonpressure tank cars
(3) Pneumatically unloaded hopper cars
(4) Pressure tank cars

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

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

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

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

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

(1) Cryogenic liquid tank
(2) Nonpressure tank
(3) Pressure tank

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

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

**7.2.1.1.6** Given examples of the following radioactive materials packages, the hazardous materials technician shall identify the container/package by name and identify the typical contents by name:
(1) Excepted
(2) Industrial
(3) Type A
(4) Type B
(5) Type C

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

**7.2.1.2.1** Using the markings on the container, the hazardous materials technician shall identify the capacity (by weight or volume) of the following examples of transportation vehicles:
(1) Cargo tanks
(2) Tank cars
(3) Tank containers

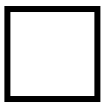
**7.2.1.2.2** Using the markings on the container and other available resources, the hazardous materials technician shall identify the capacity (by weight or volume) of each of the following facility containers:
(1) Cryogenic liquid tank
(2) Nonpressure tank (general service or low-pressure tank)
(3) Pressure tank

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

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

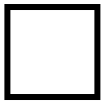
**7.2.1.3.2** The hazardous materials technician shall identify the steps in an analysis process for identifying an unknown atmosphere.

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



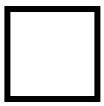
(1) Corrosivity
(2) Flammability
(3) Oxidation potential
(4) Oxygen deficiency
(5) Pathogenicity
(6) Radioactivity
(7) Toxicity

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

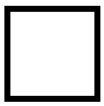


(1) Biological immunoassay indicators
(2) Chemical agent monitors (CAMs)
(3) Colorimetric indicators [colorimetric detector tubes, indicating papers (pH paper and meters), reagents, test strips]
(4) Combustible gas indicator
(5) DNA fluoroscopy
(6) Electrochemical cells (carbon monoxide meter, oxygen meter)
(7) Flame ionization detector
(8) Gas chromatograph/mass spectrometer (GC/MS)
(9) Infrared spectroscopy
(10) Ion mobility spectroscopy
(11) Mass channel analyzer
(12) Metal oxide sensor
(13) Photoionization detectors
(14) Polymerase chain reaction (PCR)
(15) Radiation detection and emasurement instruments
(16) Raman spectroscopy
(17) Surface acoustical wave (SAW)
(18) Wet chemistry

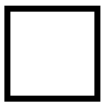
**7.2.1.3.5*** Given three hazardous materials/WMD, one of which is a solid, one a liquid, and one a gas, and using the following monitoring equipment, test strips, and reagents, the hazardous materials technician shall select from the following equipment and demonstrate the correct techniques to identify the hazards (corrosivity, flammability, oxidation potential, oxygen deficiency, radioactivity, toxicity, and pathogenicity):
(1) Carbon monoxide meter
(2) Colorimetric tubes
(3) Combustible gas indicator
(4) Oxygen meter
(5) Passive dosimeters
(6) pH indicators and pH meters
(7) Photoionization and flame ionization detectors
(8) Radiation detection instruments
(9) Reagents
(10) Test strips
(11) WMD detectors (chemical and biological)
(12) Other equipment provided by the AHJ



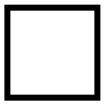
**7.2.1.3.6** Given monitoring equipment, test strips, and reagents provided by the AHJ, the hazardous materials technician shall demonstrate the field maintenance and testing procedures for those items.



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

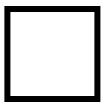


**7.2.1.5** The hazardous materials technician shall demonstrate methods for collecting samples of the following:
(1) Gas
(2) Liquid
(3) Solid



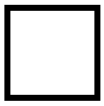
**7.2.2 Collecting and Interpreting Hazard and Response Information.** Given access to printed and technical resources, computer databases, and monitoring equipment, the hazardous materials technician shall collect and interpret hazard and response information not available from the current edition of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

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



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

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



(1) Acid, caustic
(2) Air reactivity
(3) Autorefrigeration
(4) Biological agents and biological toxins
(5) Blood agents
(6) Boiling point
(7) Catalyst
(8) Chemical change
(9) Chemical interactions
(10) Compound, mixture
(11) Concentration
(12) Critical temperature and pressure
(13) Dissociation and corrosivity
(14) Dose
(15) Dose response
(16) Expansion ratio
(17) Fire point
(18) Flammable (explosive) range (LEL and UEL)
(19) Flash point
(20) Half-life
(21) Halogenated hydrocarbon
(22) Ignition (autoignition) temperature
(23) Inhibitor
(24) Instability
(25) Ionic and covalent compounds
(26) Irritants (riot control agents)
(27) Maximum safe storage temperature (MSST)
(28) Melting point and freezing point
(29) Miscibility
(30) Nerve agents
(31) Organic and inorganic
(32) Oxidation potential
(33) Persistence
(34) pH
(35) Physical change
(36) Physical state (solid, liquid, gas)
(37) Polymerization
(38) Radioactivity
(39) Reactivity
(40) Riot control agents
(41) Saturated, unsaturated (straight and branched), and aromatic hydrocarbons
(42) Self-accelerating decomposition temperature (SADT)
(43) Solubility
(44) Solution and slurry
(45) Specific gravity
(46) Strength
(47) Sublimation
(48) Temperature of product
(49) Toxic products of combustion
(50) Vapor density
(51) Vapor pressure
(52) Vesicants (blister agents)
(53) Viscosity
(54) Volatility

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

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

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

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

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

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

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

(1) Cargo tanks ☐
- (a) Compressed gas tube trailers
- (b) Corrosive liquid tanks
- (c) Cryogenic liquid tanks
- (d) Dry bulk cargo tanks
- (e) High-pressure tanks
- (f) Low-pressure chemical tanks
- (g) Nonpressure liquid tanks

(2) Fixed facility tanks ☐
- (a) Cryogenic liquid tanks
- (b) Nonpressure tanks
- (c) Pressure tanks

(3) Intermediate bulk containers (also known as tote tanks) ☐

(4) Intermodal tanks ☐
- (a) Nonpressure intermodal tanks
  - i. IM-101 portable tank (IMO Type 1 internationally)
  - ii. IM-102 portable tank (IMOType 2 internationally)
- (b) Pressure intermodal tanks (DOT Specification 51; IMO Type 5 internationally) ☐
- (c) Specialized intermodal tanks ☐
  - i. Cryogenic intermodal tanks (DOT Specification 51; IMO Type 7 internationally)
  - ii. Tube modules

(5) One-ton containers (pressure drums) ☐

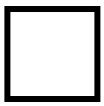
(6) Pipelines ☐

(7) Railroad cars ☐
- (a) Cryogenic liquid tank cars
- (b) Nonpressure tank cars
- (c) Pneumatically unloaded hopper cars
- (d) Pressure tank cars

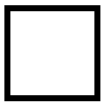
**7.2.3.1.2** The hazardous materials technician shall identify the basic design and construction features, including closures of the following nonbulk containers: ☐

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

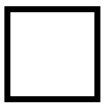
**7.2.3.1.3** The hazardous materials technician shall identify the basic design features and testing requirements on the following radioactive materials packages:
(1) Excepted
(2) Industrial
(3) Type A
(4) Type B
(5) Type C



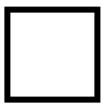
**7.2.3.2** The hazardous materials technician shall describe how a liquid petroleum product pipeline can carry different products.



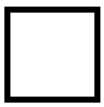
**7.2.3.3** Given an example of a pipeline, the hazardous materials technician shall identify the following:
(1) Ownership of the line
(2) Procedures for checking for gas migration
(3) Procedure for shutting down the line or controlling the leak
(4) Type of product in the line



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

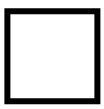


**7.2.3.5** Given a scenario involving radioactive materials, the hazardous materials technician, using available survey and monitoring equipment, shall determine if the integrity of any container has been breached.

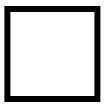


**7.2.4 Predicting Likely Behavior of Materials and Their Containers Where Multiple Materials Are Involved.** Given examples of hazardous materials/WMD incidents involving multiple hazardous materials or WMD, the hazardous materials technician shall predict the likely behavior of the material in each case and meet the requirements of 7.2.4.1 through 7.2.4.3.

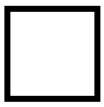
**7.2.4.1** The hazardous materials technician shall identify at least three resources available that indicate the effects of mixing various hazardous materials.



**7.2.4.2** The hazardous materials technician shall identify the impact of the following fire and safety features on the behavior of the products during an incident at a bulk liquid facility and explain their significance in the analysis process:
(1) Fire protection systems
(2) Monitoring and detection systems
(3) Pressure relief and vacuum relief protection
(4) Product spillage and control (impoundment and diking)
(5) Tank spacing
(6) Transfer operations

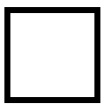


**7.2.4.3** The hazardous materials technician shall identify the impact of the following fire and safety features on the behavior of the products during an incident at a bulk gas facility and explain their significance in the analysis process:
(1) Fire protection systems
(2) Monitoring and detection systems
(3) Pressure relief protection
(4) Transfer operations

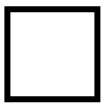


**7.2.5 Estimating the Likely Size of an Endangered Area.** Given examples of hazardous materials/WMD incidents, the hazardous materials technician shall estimate the likely size, shape, and concentrations associated with the release of materials involved in an incident by using computer modeling, monitoring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

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



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



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

(1) Counts per minute (cpm) and kilocounts per minute (kcpm)
(2) Immediately dangerous to life and health (IDLH) value
(3) Incubation period
(4) Infectious dose
(5) Lethal concentrations (LC50)
(6) Lethal dose (LD50)
(7) Parts per billion (ppb)
(8) Parts per million (ppm)
(9) Permissible exposure limit (PEL)
(10) Radiation absorbed dose (rad)
(11) Roentgen equivalent man (rem), millirem (mrem), microrem (μrem)
(12) Threshold limit value ceiling (TLV-C)
(13) Threshold limit value short-term exposure limit (TLVSTEL)
(14) Threshold limit value time-weighted average (TLV-TWA)

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

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

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

**7.3 Competencies — Planning the Response.**

**7.3.1 Identifying Response Objectives.**

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

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

**7.3.2 Identifying the Potential Response Options.**

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

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

**7.3.3 Selecting Personal Protective Equipment.** Given scenarios of hazardous materials/WMD incidents with known and unknown hazardous materials/WMD, the hazardous materials technician shall determine the personal protective equipment for the response options specified in the incident action plan in each situation and shall meet the requirements of 7.3.3.1 through 7.3.3.4.7.

**7.3.3.1** The hazardous materials technician shall identify and describe the four levels of personal protective equipment as specified by the Environmental Protection Agency (EPA) and the National Institute for Occupational Safety and Health (NIOSH). ☐

**7.3.3.2** The hazardous materials technician shall identify and describe personal protective equipment options available for the following hazards: ☐
(1) Thermal
(2) Radiological
(3) Asphyxiating
(4) Chemical (liquids and vapors)
(5) Etiological (biological)
(6) Mechanical (explosives)

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

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

**7.3.3.4.1** The hazardous materials technician shall describe the following terms and explain their impact and significance on the selection of chemical-protective clothing:
(1) Degradation
(2) Penetration
(3) Permeation

☐

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

☐

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

☐

**7.3.3.4.4** The hazardous materials technician shall identify the relative advantages and disadvantages of the following heat exchange units used for the cooling of personnel in personal protective equipment:
(1) Air cooled
(2) Ice cooled
(3) Water cooled
(4) Phase change cooling technology

☐

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

☐

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

☐

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

☐

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

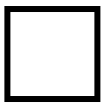
(1) Describe the advantages and limitations of each of the following decontamination methods: ☐

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

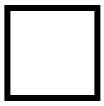
(2) Identify three sources of information for determining the applicable decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident. ☐

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

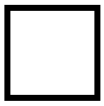
**7.3.5.1** The hazardous materials technician shall describe the purpose of, procedures for, equipment required for, and safety precautions used with the following techniques for hazardous materials/WMD control:
(1) Absorption
(2) Adsorption
(3) Blanketing
(4) Covering
(5) Damming
(6) Diking
(7) Dilution
(8) Dispersion
(9) Diversion
(10) Fire suppression
(11) Neutralization
(12) Overpacking
(13) Patching
(14) Plugging
(15) Pressure isolation and reduction (flaring; venting; vent and burn; isolation of valves, pumps, or energy sources)
(16) Retention
(17) Solidification
(18) Transfer
(19) Vapor control (dispersion, suppression)



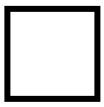
**7.3.5.2** Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall develop the site safety and control plan that must be included as part of the incident action plan.



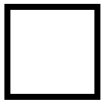
**7.3.5.2.1** The hazardous materials technician shall list and describe the safety considerations to be included.



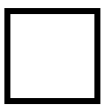
**7.3.5.2.2** The hazardous materials technician shall identify the points that should be made in a safety briefing prior to working at the scene.



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



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



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

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

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

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

(1) Describe three safety procedures for personnel workingin chemical-protective clothing. ☐

(2)*Describe three emergency procedures for personnel working in chemical-protective clothing. ☐

(3) Demonstrate the ability to don, work in, and doff selfcontained breathing apparatus in addition to any other respiratory protection provided by the AHJ. ☐

(4) Demonstrate the ability to don, work in, and doff liquid splash–protective, vapor-protective, and chemicalprotective clothing in addition to any other specialized protective equipment provided by the AHJ. ☐

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

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

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

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

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

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

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

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

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

(5) Identify the maintenance and inspection procedures for the tools and equipment provided for the control of hazardous materials releases according to the manufacturer's specifications and recommendations. ☐

(6) Identify three considerations for assessing a leak or spill inside a confined space without entering the area. ☐

(7)*Identify three safety considerations for product transfer operations. ☐

(8) Given an MC-306/DOT-406 cargo tank and a dome cover clamp, demonstrate the ability to install the clamp on the dome. ☐

(9) Identify the methods and precautions used to control a fire involving an MC-306/DOT-406 aluminum shell cargo tank. ☐

(10) Describe at least one method for containing each of the following types of leaks in MC-306/DOT-406, MC-307/DOT-407, and MC-312/DOT-412 cargo tanks: ☐

(a) Dome cover leak
(b) Irregular-shaped hole
(c) Puncture
(d) Split or tear

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

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

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

(1) Technical decontamination operations in support of entry operations ☐

(2) Technical decontamination operations involving ambulatory and nonambulatory victims

(3) Mass decontamination operations involving ambulatory and nonambulatory victims

**7.5 Competencies — Evaluating Progress.**

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

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

**7.6 Competencies — Terminating the Incident.**

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

(1) Describe three components of an effective debriefing.

(2) Describe the key topics of an effective debriefing.

(3) Describe when a debriefing should take place.

(4) Describe who should be involved in a debriefing.

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

(1) Describe three components of an effective critique. ☐

(2) Describe who should be involved in a critique. ☐

(3) Describe why an effective critique is necessary after a hazardous materials/WMD incident. ☐

(4) Describe which written documents should be prepared as a result of the critique. ☐

**7.6.3 Reporting and Documenting the Incident.** Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall complete the reporting and documentation requirements consistent with the emergency response plan or standard operating procedures and shall meet the following requirements:

(1) Identify the reports and supporting documentation required by the emergency response plan or standard operating procedures. ☐

(2) Demonstrate completion of the reports required by the emergency response plan or standard operating procedures. ☐

(3) Describe the importance of personnel exposure records. ☐

(4) Describe the importance of debriefing records. ☐

(5) Describe the importance of critique records. ☐

(6) Identify the steps in keeping an activity log and exposure records. ☐

(7) Identify the steps to be taken in compiling incident reports that meet federal, state, local, and organizational requirements. ☐

(8) Identify the requirements for compiling hot zone entry and exit logs. ☐

(9) Identify the requirements for compiling personal protective equipment logs. ☐

(10) Identify the requirements for filing documents and maintaining records. ☐