DRILL OF THE MONTH

DRILL TOPIC: HAZARDOUS MATERIALS - INITIAL RESPONSE REFRESHER

LEVEL OF INSTRUCTION:

TIME REQUIRED: TWO HOURS

MATERIALS: DOT Emergency Response Guidebook, Local SOG’s

REFERENCES: HAZARDOUS MATERIALS: AWARENESS & OPERATIONS, JONES & BARTLETT, CHAPTER 5
HAZARDOUS MATERIALS: MANAGING THE INCIDENT, JONES & BARTLETT, CHAPTER 4

PREPARATION:

MOTIVATION:

OBJECTIVE (SPO): 1-1

The student will be able to demonstrate a basic understanding of the need for a flexible management system to deal with a hazardous materials incident and apply the Eight Tactical Functions to manage a Hazardous Materials Incident.

OVERVIEW:

Hazardous Materials - Initial Response

* Need for Managing a Hazardous Materials Response
* Utilizing the Eight Tactical Functions to Manage the Incident
I. Overview of the need to manage a Hazardous Materials response

A. Hazardous materials incidents present emergency responders with a wide variety of hazards different from those encountered at typical structural fire situations.
   1. Possible BLEVE due to container failure
   2. Toxic vapors, corrosive liquids, water reactive chemicals
   3. Contamination

B. The potential for exposures of response personnel to various chemicals which may present chronic health issues demonstrates the need to manage the incident in an effective but cautious manner.
   1. Carcinogens
   2. Asphyxiants
   3. Biological toxins
   4. Nerve agents

C. Hazardous Materials incidents usually require additional resources from other agencies and are more time-consuming than normal fire department operations. Need planning to insure the incident is handled safely and effectively.

D. The majority of Haz Mat responses are minor in nature and deal with limited quantities of chemicals. Utilizing an IMS on all Haz Mat incidents which follows the eight step process will prepare response personnel for the large scale incident when it occurs.

E. Haz mat responses need a flexible management system which expands as the size and nature of the emergency expands. It should build upon the actions of the initial arriving units and identify the roles and responsibilities of additional response personnel.
II. Eight Functional Tasks to Manage a Hazardous Materials Incident

A. Incident Size-up and Scene Control

1. Determine and secure the physical layout of the emergency scene when hazardous materials are involved in the incident.

2. Approach and positioning of personnel and equipment
   a. Uphill and upwind
   b. Staging of additional apparatus

3. Isolate the area and deny entry

4. Need for evacuation / sheltering in place.

5. Establishment of safety zones

B. Identification of the Hazardous Materials Involved

1. Container Shapes (Highway cargo vehicles / Railroad tank cars)

2. Markings & Colors of Tanks/ Cylinders / Containers

3. DOT Placards & Labels (UN ID #)

4. Shipping documents / Bills of lading

5. Occupancy /Locations (Pre-plans)  NFPA 704 Marking System

6. Monitoring & Detection devices
C. Hazard /Risk Assessment

1. Hazards – the physical and chemical properties of the material
   a. Flash Point
   b. Flammable Range
   c. Vapor Density
   d. Specific Gravity

2. Risks - probability of suffering harm or injury.
   a. Risk levels are variable and influenced by the various factors:
      1) Hazardous nature of the material involved
      2) Quantity of the material involved
      3) Type of container and type of stress applied to it
      4) Proximity of Exposures
      5) Amount of available resources

3. Hazard /Risk assessment tasks
   a) Gathering hazard information
      1) Emergency Response Guidebook
      2) CHEMTREC
      3) Haz Mat Databases
      4) Technical specialists
   b) Predicting Haz Mat behavior and evaluating outcomes
1) Estimating Likely Harm

a) Liquid spill
b) Vapor cloud
c) Container failure
d) Environmental impact

D. Evaluation of PPE and Equipment Required

1. Types of PPE

   a) Level A (Fully Encapsulated w/SCBA)
   b) Level B (Chemical Protective suit w/SCBA)
   c) Level C (Chemical splash suit w/ APR)
   d) Level D (Work uniform w/hard hat & eye protection)

2. Selection criteria for PPE

   a) Chemical properties of hazardous material involved
   b) Type of tasks involved by response personnel

E. Information and Resource Coordination

1. Ensure that all information and resources compiled during the incident are coordinated.

2. Implementation of IMS system

   a) Assume Command
b) Establish Incident Command Post

c) Designate Functional Responsibilities

d) Coordination of all operations

F. Control of Hazardous Materials Releases (Determined by the training levels of response personnel)

1. Control – procedures, techniques, and methods used in the mitigation of a haz mat incident

2. Containment - procedure to keep the material in its container (leak control, patching and plugging)

3. Confinement - procedure to keep a material in a defined area (spill control)

4. Defensive Measures - control of a haz mat release with limited personal exposure (diking and retention)

5. Offensive Measures - requires personnel to enter Hot Zone to control release at its source (closing valves, plugging or patching damaged containers or piping)

G. Decontamination Procedures

1. Emergency Decon

2. Mass Decon

3. Methods of Decon

   a. Dilution
b. Absorption

c. Chemical Degradation

d. Isolation

e. Disposal

H. Termination Activities

1. Incident Debriefing

2. Post Incident Analysis

3. Critique

III. REVIEW

- Eight Step Method of Handling a Haz Mat Incident