This slide to be displayed at the beginning of the class.
Course Information

• Course # 1746-2009-???
• Course Title WMD Awareness

HazMat/WMD Awareness Introduction Slide 2
Introduction

• Who am I?
• Who are you?

Introduce yourself
Depending on class size allow class to introduce themselves their occupation and years of service.
Agenda

- Introduction  30 minutes
- Responsibilities  60 minutes
- Understanding HM  30 minutes
- R & ID  120 minutes
- The ERG  45 minutes

Times are approximate and include breaks
## Agenda (cont.)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Terrorism</td>
<td>60 minutes</td>
</tr>
<tr>
<td>Decontamination</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Protective Clothing</td>
<td>2 hrs</td>
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</tbody>
</table>

Protective Clothing is focused at individuals that have been issued the first responder kits.
Introduction (cont.)

• Disclaimer
• Executive Annex
• Table of Contents

• From the book read and explain the executive annex if teaching a program to participants using the First Responder Kit.

• Show the table of contents
Introduction (cont.)

- Course Description and Objectives
  - OSHA 29 CFR 1910.120(q)(6)(l)
  - NFPA
  - Office of Domestic Preparedness

• From the book read and explain OSHA 1910.120. This is the basic requirements that this whole course was built on (Page V)

• Advise the students of the competencies from ODP The Office of Domestic Preparedness Guidelines. They include being knowledgeable in the OSHA requirements for hazardous materials response as well as knowledge needed for terrorism events (Page vi-vii).

• Read ODP Course Objectives (bottom Page viii to ix).
Introduction (cont.)

• Terminology
  ➢ Hazardous Materials
  ➢ Terrorism

• Definitions

• Read from the book and explain the above definitions.

NOTE: First Responder can also be anyone that “happens upon” an incident and is trained to initiate the proper response while maintaining a completely defensive posture.

• Advise the students this manual will prove to be a great resource, including the expanded Terminology and Definitions Sections
UNIT ONE

Role and Responsibility of the First Responder

This section is about 60 minutes

Unit 1 Objectives: At the completion of this unit, the student will:

1. Be able to identify the five levels of hazardous materials training for Emergency Responders;

2. Understand the different ways to recognize the presence of a hazardous material;

3. Explain procedures for Command & Control of an incident involving a hazardous substance.
Federal laws and standards

• Superfund Amendments and Reauthorization Act (SARA).
• 29 CFR 1910.120 and EPA 40 CFR part 311

Federal Laws and Standards

In 1986, Congress passed the Superfund Amendments and Reauthorization Act (SARA). This law required OSHA and EPA to create standards for the training of First Responders who respond to a release or spill of a hazardous substance.

• OSHA 1910.120 and EPA part 311 are identical standards.
• In Ohio police, EMS and fire personnel are required to meet these standards dependent on their response role.
Five levels of training

- Awareness
- Operations
- Technician
- Specialist
- On Scene Incident Commander

• Overview of the five levels
First Responder Awareness

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 proper authorities of the release. They would take no further action beyond notifying the authorities of the release.

I. Individuals who:

   A. Witness or discover a hazardous substance release

   B. Initiate an emergency response

   C. Would take no further action

This course trains you to the First Responder Awareness Level.
II. Individuals who:

A. Respond to releases or potential releases as part of the initial response

B. Protect nearby persons, property, or environment

C. Are trained to respond in a defensive fashion

D. Contain the release from a safe distance
   • Keep it from spreading
   • Prevent exposures

*NOTE: This is the minimum level for response to defensively protect lives and property.
Hazardous Material Technician

Individuals who respond to a release or potential releases for the purpose of stopping the release. They assume a more aggressive role than the 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.

III. Individuals who:

A. Stop the release
   - Plug
   - Patch

NOTE: This is the minimum level for entry into the Hot Zone for offensively handling Hazardous Materials.
Hazardous Material Specialist

Individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain.

IV. Individuals who:

A. Provide support to HazMat Technicians

   • Examples: Individuals with expertise in:
     • Chemistry
     • Communications/Referencing
     • Explosives
     • Environment

B. The Ohio National Guard’s 52nd WMD Civil Support Team out of Rickenbacker National Guard Base is an example of a specialist level team. They specialize in identification of the products likely to be used by a terrorist.
On Scene Incident Commander

Individuals who will assume control of the incident scene beyond the first responder awareness level. Incident commanders shall have received training equal to the operations level.

V. Anyone having jurisdictional responsibility for command

   A. Hazardous Materials: Operations Level training is a minimum prerequisite for the Incident Command position.

   NOTE: The Incident Command System and Organizational Structure will be discussed further in this Unit.
What is my role as a First Responder at the Awareness Level?

Ask the participants what they feel their role is.
First Responders must be able to perform basic:

- Recognition
- Identification
- Isolation/Protection
- Notification, and
- Initiation of the Incident Command System

These are the answers that this book suggests as being correct. This is an announcer slide and we will discuss each one in detail.
Recognition

• The First Responder must be able to recognize a hazardous materials incident.

RESPONDERS SHOULD NOT RUSH IN! IF YOU ARE HURT OR KILLED YOU CAN NOT HELP ANYONE.

VI. Recognition

A. Whether an:

• Actual release
• Potential release
• Or a Threat
Be Aware any of the following:

- Vapor clouds
- Smoke
- Injured Persons
- Environmental Damage
- Evidence of explosive devices
- Booby traps
- Surrounding populations
- Dispersion pathways
- Suspicious persons around the scene

VII. Discuss how each item can cause concern to the responder.

A. Vapor Clouds and Smoke
   - Document color and density

B. Obvious Victims
   - Ill
   - Unconscious
   - Product or foreign material on their person

C. Environmental Damage
   - Product in waterways
   - Product in storm water system
   - Dead animals or dead vegetation

D. Explosive Devices & Booby Traps
   - Secondary Devices

E. Surrounding Populations and Dispersion Pathways
   - Affected by Wind direction

F. Suspicious Persons
   - Do not be concerned about “profiling” at this point
VIII. Potential Ignition Sources

A. Be aware of potential ignition sources
   • In the area of the release
   • Adjacent to the release

B. An example of Exothermic Reactions
   • Bases or Acids mixed with water
   • Epoxies
IX. Identification

NOTE: Talk briefly about each clue and explain that we will go over these clues in more detail in Unit 3

A. Occupancy/Location
   • Hardware Stores or Auto Parts locations
   • Industrial or Manufacturing

B. Containers, Markings, Placards, & Labels
   • Discussed in detail in Unit 2
It is not the responsibility of the first responder to disregard their own personal safety for the identification of the hazard.

Emphasize this slide.

IF IN DOUBT – DON’T DO IT!
THE FIRST RESPONDER SHOULD PROTECT THEMSELVES FIRST!

Isolation / Protection

- Isolate the area by prohibiting access
- Move un-injured & un-contaminated people outside of the release area
- Isolate anyone contaminated

X. Isolation / Protection

A. There may be instances when First Responders encounter victims at a hazardous materials incident.

B. If precautions are not taken, Responders may become contaminated themselves.

C. Any contaminated person should be immediately flushed with water.

NOTE: First responders should follow the information given in the North American Emergency Response Guidebook for isolation and protection distances. This book will be fully explained in Unit 4.
Isolation / Protection (cont.)

• Stop at a safe distance and use binoculars or such vision-enhancing device to assess the scene for placards or other clues.

THE STOPPING POINT MAY BE DIFFERENT FOR EACH INCIDENT

D. Consider that the incident may be an intentional act
   • Must preserve the area as a crime scene

E. Consider “Secondary” devices
   • Responders are frequently a target

F. Clandestine drug manufacturing laboratories present similar problems to the First Responder.
   • First Responders should be aware of potential dangers when responding to this type of a hazardous incident.
   • There are no traditional locations to find clandestine drug laboratories.
RESPONDERS MUST NOT EXCEED THEIR LEVEL OF TRAINING AND PROTECTION.
HAZARDOUS MATERIAL FIRST RESPONDERS TRAINED TO THE AWARENESS LEVEL SHOULD NEVER PASS INTO THE CONTAMINATED AREA OF THE RELEASE FOR ANY REASON OUTSIDE OF DUTY TO SAVE LIVES.

Emphasize slide
XI. Notification

A. The First Responder should communicate all information gathered during the approach and the initial scene survey
   1. To the radio dispatcher
   2. To the command post (if it has been established)
   3. The purpose of this imperative information is so other responding units do not inadvertently approach from the hazardous side of the incident.

B. Resources that are available to assist in a hazardous material incident are listed above.

C. Another resource that is frequently overlooked is the County Emergency Management Agency (EMA)
   1. They can assist in Planning and Recovery
   2. Major component for Cost Recovery
What they need to know

- The chemical name, placard and/or U.N. number with a description of the incident.
- Weather conditions and wind direction
- Status of the hazardous material container
  (stable, leaking, burning, etc.)
- The location impacted
  (residential, commercial, industrial, etc.)
- Victim’s injuries

D. It is important to provide timely and accurate information
   1. Whenever possible state the chemical name
   2. Associated placard or U.N. number
   3. Description of the incident. Descriptions may include:
      • Weather conditions and wind direction
      • Status of the hazardous material container
        (stable, leaking, burning, etc.)
      • The location impacted
        (residential, commercial, industrial, etc.)

E. Victims (if any) and their conditions or injuries
Incident Command

The role of the Incident Commander (IC) will be assumed by the appropriate authority, as designated by state or local law. In many cases, the IC will be the most senior public safety officer (most likely the fire department chief or deputy chief, however, in many circumstances it may be a local sheriff or senior local or state police official). As such, it is the responsibility of the IC to establish the Incident Command System (ICS) and to ensure that notifications of the above mentioned responders have been made or are in the process of being made. As the referenced agencies arrive, the IC will evolve into a Unified Command, as necessary.

XII. The Incident Command System

A. The above information is an excerpt from a Coordinated Document prepared for and by the FBI, DHS, HHS/CDC

B. It is titled “Guidance on Initial Responses to a Suspicious Letter/Container With a potential Biological Threat.

Special Instructor Note: The significance of this slide is to promote the philosophy and importance of *Unified Command.*
The Incident Commander

The Ohio Revised Code 3737.80 specifies:

In any emergency situation relating to the prevention of an imminent release of a hazardous material, to the cleanup or disposal of a hazardous material that has been released, or to the related mitigation of the effects of a release of a hazardous material, the chief of the fire department in whose jurisdiction the emergency situation is occurring or his designee is responsible for primary coordination of the on-scene activities of all agencies of the state, the United States government, and political subdivisions that are responding to the emergency situation until the chief relinquishes that responsibility to a representative of one of the responding public agencies and so notifies that representative.

C. As stated in the previous slide, the Fire Chief will normally assume command upon his arrival.
D. ICS Organizational Chart
E. Incident Commander
Safety Officer – Tasked with the responsibility to maintain the health and safety issues of site operations. He shall have the authority to Suspend, Alter, or Terminate any operations that are determined to be unsafe or immediately dangerous to life or health (IDLH)

F. Safety Officer

- This person should have Safety Officer training
- If the Safety Officer finds it necessary to Suspend, Alter, or Terminate an operation, he must:
  1. consider what impact that decision may have on other operations
  2. attempt to notify the IC first
PIO – Their purpose is to make contact with the media and the general public. They will release information regarding site activities.

G. The Public Information Officer should also have special training
• Handling the news media
• Coordinating the release of information with the IC
Liaison — Serves as the contact between the Incident Commander and other governmental and/or private organizational personnel.

H. Liaison Officer

• Also requires special training as this is also a Command Staff position
I. Financial Officer

• County EMA is a potential resource for this position
Logistics – Oversees the delivery of the manpower, supplies and/or the equipment to effectively control the incident site.

J. Logistics
• This illustrates resources to support Logistics
Planning – Develops an emergency action plan and monitors the success of the established plan.

K. Planning

• County EMA may be a resource for Planning, also
• Possible resources to support Planning
Operations – Directs the activities of the team leaders within the site and coordinates these activities with the I.C.

L. Operations
  • Task level
• Question for Responders to determine where they might fit in

1. Why am I here?

2. What did I bring to assist
   • Equipment
   • Expertise
Unified Command

- New federal Guidelines
- National Incident Management System (NIMS)

Under new federal guidelines for ICS, “Unified Command” is addressed. Unified Command requires all agencies that have major roles in mitigating an incident to work together in developing a single action plan. These co-leaders must mesh the priorities of each agency represented in the command structure.
XIII. Response Procedures

A. Each agency should have a
   • Standard Operating Procedure (SOP) that coordinates all of that agency’s operations
   • An Emergency Response Plan (ERP)

B. It is very important for the two plans to work in concert with each other
ICS Summary

• The first fifteen minutes on the scene of a hazardous materials incident will set the stage for the remaining response. If the initial response is safe and appropriate and the first responder fulfills their duty to recognize, identify, isolate, protect, notify and establish command then the subsequent responders can build upon this foundation and safely mitigate the hazard.
UNIT ONE TEST

Allow 10 minutes for this test
This section is about 30 minutes

Unit 2 Objectives: At the completion of this Unit, the student will:

• Identify potential outcomes from exposure to a hazardous substance/material

• Identify the difference between an accidental hazmat incident and a terrorist attack
I. Potential Outcomes

A. The possibility that a hazardous incident may be either accidental or intentional should always be on the forefront of the responder’s assessment.

B. Hazardous materials have the potential for an enormous impact on
   • Victims
   • Responders
   • The community
   • The surrounding environment

C. The mechanisms of harm that are presented to responders are
   • Chemical
   • Thermal
   • Asphyxiation
   • Ionizing Radiation
   • Etiological
   • Mechanical
B. Thermal (Fire and/or Explosion)

1. Effects can range from
   - Minor discomfort to tissue damage
   - Extreme cases - death
D. Ionizing Radiation

1. Alpha Particle
   - Will not penetrate skin
   - Can cause long-term respiratory damage
   - Very hazardous

2. Beta Particle
   - Will penetrate skin, but not deep tissue
   - If breathed in will cause severe internal damage
3. Gamma Radiation
   • Pure radiation energy
   • Will cause whole body tissue damage

4. Neutron Radiation
   • Generated by a nuclear explosion only
• Penetrating properties of the four types of radiation

**Instructor Note:**
Four nuclear facilities that have fall-out potential in Ohio are illustrated on Page 14 of the Student Manual

In Ohio – Davis Besse and Perry;
In Michigan - Fermi;
In Pennsylvania - Beaver Valley.

**Question:**
Are there any sources of Radiation in the area you serve or protect?
Asphyxiation

• Oxygen Deficiency
• Chemical Reaction

THE RELEASE OF CERTAIN PRODUCTS (I.E. NITROGEN) CAN DEPLETE THE OXYGEN LEVEL BELOW SURVIVAL LIMITS.

C. Asphyxiation

1. Oxygen deficient atmosphere
   • Can be caused by displacement or consumption of oxygen.

2. Chemical Reaction
   • Toxic substances can cause physical pathological changes within the body preventing the body from properly using oxygen.
Chemical

• Toxic or poisonous effects
• Destructive effects from the exposure of the chemical on human tissue

A. Chemical

1. Toxic or poisonous effects
   • All chemicals are poisonous
   • Effects may be delayed dependent on concentration
E. Etiological

1. Injury or illness caused by the exposure to disease causing agents

2. Bacteria
   - Salmonella
   - Anthrax
   - Botulism

3. Viruses
   - Ecoli
   - Small pox
F. Mechanical

1. Physical hazards which may cause bodily harm

• Debris
• Excessive percussion (Noise)
II. Routes of exposure or Entry

A. Hazardous materials can enter the body through

1. Inhalation
2. Ingestion
3. Absorption
4. Injection.
1. Inhalation

a. Breathing in any substance can put it in direct contact with tissues in the respiratory system

b. It is then absorbed by the blood stream and transported throughout the body

c. Inhalation is the quickest route into the system

d. The respiratory System is the easiest to protect
   • Self Contained Breathing Apparatus (SCBA
   • Air Purifying Respirator (APR)
2. Ingestion

a. Swallowing any substance will create direct contact with the tissues in the digestive tract.

b. Be aware of cross contamination
   - Putting contaminated objects in mouth
   - Accidental/Incidental Ingestion
     - cigarettes
     - food or drink
Absorption

- Eyes
- Skin

3. Absorption

a. Any substance that passes into the body upon contact with the skin or eyes
   - Protection is provided by PPE
4. Injection

a. Any time an item is contaminated and introduces a puncture, tear or cut in the skin it is classified as an injection.
Exposure to Hazards

• Acute
• Chronic

• Both types of exposures can have acute (immediate) and/or chronic (long term) effects.

III. Exposure to Hazards

A. There is a difference between exposures and effects

B. Both can be chronic or acute

1. Spilling battery acid on your hand is an acute exposure
   • It will immediately burn your hand

2. Liver disease from alcoholism is a chronic effect from a long term exposure.
Terrorist Events

- Intentional release
- Secondary devices
- Inflict mass casualties

IV. Terrorist Events

A. The major difference between an accidental release and an intentional release is the exposure duration

B. Secondary devices as well as multiple substances are designed to maximize harm

C. The First Responder must be even more cautious when a terrorist incident is suspected.

Instructor Note: “Dirty Bombs” can be used to disperse nuclear, biological or chemical materials.
Terrorist Chemical Agents

- Choking Agents
- Blood Agents
- Blister Agents
- Nerve Agents

The symptoms of these exposures can range from a runny nose to rapid death and are considered to be available to terrorist groups worldwide.

D. During times of warfare there have been substances developed, or adopted, to inflict mass casualties.

E. Some of these substances include:
   - Choking Agents - chlorine, anhydrous ammonia
   - Blood Agents - cyanide
   - Blister Agents - mustard agent
   - Nerve Agents - serin, organophosphates

F. Symptoms can range from a runny nose to rapid death
   - Considered to be available to terrorist groups worldwide.
V. Emergency Medical Care

A. Patient(s) may have to be decontaminated prior to medical assessment

B. Safety First!
   • “If in Doubt – Don’t Expose Yourself or Others!”
Emergency Decon

If a rescue is attempted and is successful
• the victim and the rescuer should be flushed with copious amounts of water
• Strip their outer level of clothing
• await hazardous materials operations level responders to arrive

THE RESCUER NOW BECOMES A VICTIM BECAUSE OF UNKNOWN HAZARD EXPOSURE!!!

C. Emergency Decontamination will be further discussed in Unit 7
UNIT TWO TEST

Allow 10 minutes for this test
UNIT THREE

The Ability to Recognize and Identify Hazardous Materials

Allow 120 minutes for this section

Unit 3 Objectives: At the completion of this unit, the student will:

1. While viewing photos
   • Demonstrate the ability to recognize & Identify Hazardous Materials
   • Appreciate the value of a MSDS
I. Clues of hazardous materials

A. In a hazardous materials incident, several clues can help to determine what materials may be present.

B. Six Basic Clues of Hazardous Materials

1. Occupancy and/or Location
2. Container Shape and Size
3. Markings and Colorings
4. Placards and Label Descriptions
5. Shipping Papers and MSDS
6. Human Senses
II. Occupancy and/or Location

A. The occupancy or location of an incident can provide clues as to what materials are present

B. The occupancy may be a fixed site facility or a mode of transportation.
Fixed site facilities can include:

- Farms
- Residential areas
- Power plants
- Medical facilities
- School labs and research facilities
- Manufacturing plants
- Chemical plants
- Clandestine drug labs

C. Fixed Site Facilities
1. Farms
   • Discuss hazards present at each location
2. Residential Areas
   • Where are these chemicals usually stored?
3. Power Plants

- What hazards could be found at a traditional fueled plant?
  Answer: chemicals, storage tanks, etc.
Medical facilities

- Radioactive medicines
- Resonance Imaging Equipment

4. Medical Facilities
   - From major hospitals to a local dentist’s office
   - What can be found
     
     Answer: Oxygen, Nitrogen, Nitrous Oxide, Bloodborn Pathogens
School labs and Research Facilities

• Chemical Research
• Biological Research
• Nuclear Research

5. The higher the level of education the more sophisticated the lab.
• Manufacturing Plants
• Chemical Production Plants
• Storage Facilities
• Disposal Facilities

6. Manufacturing Plants
   • Industrial chemicals used in manufacturing process

7. Chemical Production Plants
   • Industrial strength chemical production

8. Storage Facilities
   • Industrial storage tanks for bulk usage of chemicals

9. Disposal Facilities
   • Disposal facilities where wastes are destroyed
Clandestine Drug Labs

- Heavy Chemical Odors
  - Sulfur
  - Anhydrous Ammonia
  - Lye
  - Red Phosphorus
- Fortified Appearance to Location
- Occupants come outside to smoke
- Unusual Traffic at all hours

10. Clan Labs

  - Not all occupancies are legal and legitimate. Clan Labs are becoming more prevalent everywhere.
  - Propane tanks (used for cooking meth) will also be present
11.IMPORTANT: Should you come across a clandestine drug lab **DO NOT TOUCH ANYTHING!** Do not attempt to stop any drug production process that may be active in the place of discovery. Exit by the same path which you made entry and make notification to specialists that are qualified to approach and disassemble

- Contact the Local Law Enforcement Agency who will in turn notify
- Drug Enforcement Agency (DEA) or Ohio Bureau of Criminal Investigations (BCI)
B. Transportation Sources

Transportation Sources

Rail
Air
Marine
Pipeline
Highway
Rail

- Active or Abandoned
- List of telephone numbers for immediate contact

1. Rail
   - Responders should be aware of the locations of railroad lines
   - Frequency of travel (active or abandoned)
   - There should be a list of telephone numbers for immediate contact with the railroad company should an incident occur.
2. Air

- Responders should be cognizant of the air transportation sources in their area
- Air transportation can be a formidable terrorist target.
- Crop dusters are another form of air transportation for the use of spreading a hazardous material
3. Marine

- Marine transportation can be used as a source of delivery of hazardous materials
- Shipping containers can be in the form of a trailer that is simply off loaded to a dock and hooked to a truck or placed on a train car for delivery.
- If the destination is for terrorist purposes, it probably will not have proper markings on the exterior
- Quantities of hazardous materials involved can be very large
Pipeline

- Natural Gas
- Crude Oil
- Gasoline
- Diesel
- Heating Oil

4. Pipeline
   - Transportation can also include a static pipeline
   - Pipelines carry a wide variety of products including:
     - Natural gas
     - Crude oil
     - Gasoline
     - Diesel
     - Heating oil

**NOTE:** Whenever a pipeline crosses transportation routes they are required to have markers with information as to what the pipeline carries and who to contact in case of an emergency.
Responders are more likely to have a hazardous incident related to highway transportation than with any other mode.

5. Highway
   - Many different types of containers are used in highway transportation
   - First responders should familiarize themselves with these containers so that a rapid identification can be made for responder safety.

Instructor Note: The DOT Guidebook will be covered in Unit 4
III. Container Shape and Size

A. One of the most important clues in detecting hazardous materials is the shape and size of the container.

B. The general classifications of containers for hazardous materials are:
   1. Individual containers
   2. Bulk transport containers
   3. Bulk storage containers

C. Some hazardous materials require special containers, can have specific shapes to meet the properties of that hazardous material.

D. Containers can range from
   - Small plastic bottles to “thousands-of-gallons” fixed site tanks.

E. Containers can give you a clue as to whether the product is a solid, liquid or gas
   - Transportation container information is available in the front of the North American Emergency Response Guidebook.
DO NOT GO INTO GREAT DETAIL WITH THE FOLLOWING SLIDES

The information contained in the boxed area is supporting information for the Instructor. This information should only be passed on if specifically requested.

Examples of Cargo will help the student identify with container shapes.
DOT/MC 306 Non-pressure Tank

DOT 406/MC 306 Non Pressure Liquid Tank

DOT 406/MC-306 ATMOSPHERIC PRESSURE TANK TRUCK
9,000 GALLONS CAPACITY
GENERAL PURPOSE CARGO

OPS Pressure Less Than 3 PSI
Typical Maximum Capacity 9,000 Gallons
New Tanks Aluminum
Older Tanks Steel
Oval Shape/Multiple Compartments
Recessed Manholes/Rollover Protection
Bottom Valves
Will Likely have Vapor Recovery.

**Examples of Cargo**
- Gasoline
- Fuel Oil
- Alcohol
- Other Flammable/Combustible Liquids
- Liquids
- Liquid Fuel Products
  (In Non-Coded Tankers)
DOT 407/MC 307 Low Pressure Chemical Tank

- **DOT 407/MC-307 LOW PRESSURE TANK TRUCK**
  - 6,000-7,000 GALLONS CAPACITY
  - TRANSPORTS CHEMICALS, FLAMMABLE AND COMBUSTIBLE LIQUIDS

- **OPS @ 25-40 PSI**
- Typical Maximum Capacity 6,000 Gallons
- May Be Rubber Lined/Steel
- Single or Double Top Manhole
- Single Outlet Discharge for Each Compartment At Bottom (Mid-ship Or Rear)
- Typically Double Shell
- Stiffening Rings
- Rollover Protection
- May Be Multiple Compartments
- Horseshoe Or Round Shaped
- Unit Pictured Is Insulated And Covered With Smooth Metal Skin
- Tank Has Several Stiffening Rings

**Examples of Cargo**
- Flammable Liquids, Combustible Liquids, Acids, Caustics, Poisons
MC-312 Corrosive Liquid Tank

MC-312 CORROSIVE LIQUID TANK

OPS Pressure Less Than 75 PSI
Typical Maximum Capacity 6,000 Gallons
May Be Rubber Lined/Steel
Stiffening Rings And Rollover Protection
Splash Guard Provides Rollover Protection
Top Loading At Rear Or Center
Loading Area Typically Coated With Corrosive Resistant Material
Small Diameter For Length (Tube Shaped)
Typical Single Compartment

Examples of Cargo
Corrosive Liquids
Typically Acids
MC-331 High Pressure Tank

MC-331 HIGH PRESSURE TANK TRUCK
11,500 GALLONS CAPACITY
TRANSPORTS LP GAS AND ANHYDROUS AMMONIA

OPS Pressure Up To 300 PSI
Typical Maximum Capacity 11,500 Gallons
Single Steel Compartment/Non Insulated
Bolted Manhole At Front or Rear
Internal and Rear Outlet Valves
Typically Painted White Or Other Reflective Color
May Be Marked Flammable Gas and Compressed Gas
Round/Dome Shaped Ends

Examples of Cargo
Pressurized Gases & Liquids
Anhydrous Ammonia
Propane
Butane
Other Gases That Have Been Liquefied Under Pressure
MC-338 Cryogenic Liquid Tank

MC-338 CRYOGENIC LIQUID TANK TRUCK
WELL-INSULATED 'THERMOS BOTTLE' DESIGN
TRANSports LIQUID NITROGEN, OXYGEN CARBON DIOXIDE, ETC.

OPS AT Less THAN 22 PSI
Well Insulated Thermos Bottle Like Steel Tank
May Have Vapor Discharging from Relief Valves
Loading/Unloading Valves Enclosed at Rear
May Be Marked "Refrigerated Liquid"
Round Tank with Same Type of Cabinet at Rear

Examples of Cargo
Liquid Oxygen
Liquid Nitrogen
Liquid Carbon Dioxide
Liquid Hydrogen
Other Gases That Have Been Liquefied by Lowering Their Temperature
Compressed Gas/Tube Trailer

COMPRESSED GAS TRAILER
3,000-5,000 PSI
TRANSPORTS COMPRESSED GAS

OPS at 3,000-5,000 PSI (Gas Only)
Individual Steel Cylinders Stacked and Banded Together
Typically will have Over Pressure Device for each cylinder
Bolted Manhole At Front or Rear
Valves located at Rear (Protected)
Manufacturer Name May Be on cylinders, i.e. AIRCO, Liquid Air, Liquid Carbonic, etc
Flat Truck with Multiple Cylinder Stacked in Modular or Nested Shape

Examples of Cargo
Helium
Hydrogen
Methane
Oxygen
Other Gases
Dry Bulk Cargo Tanker

**DRY BULK CARGO TANKER**

- **OPS AT Less THAN 22 PSI**
- Typically Not Under Pressure
- Over the Road
- Top Side Manholes
- Bottom Valves/Air Assisted Loading/Unloading
- Shapes Vary, But Will Have Hoppers

**Examples of Cargo**
- Calcium Carbide
- Oxidizers
- Corrosive Solids
- Cement
- Plastic Pellets
- Fertilizers
F. Any of the previously discussed transportation tanks can also be found in inter-modal service.

1. These tanks are smaller in size
2. Designed for use in Rail, Marine, and over-the-road use
3. Tanks are surrounded by a frame.

4. Clockwise from top left
   • Pressure tank
   • Cryogenic tank
   • Tube tank
RAILROAD CARS

Do not go into great detail about types of Railroad Cars.
G. Pressure tank cars will have all fittings inside a dome on top of the car.
H. Non-pressure tank cars can be identified by the presence of multiple fittings on the top and/or bottom of the car.

• When in doubt always consider a tank car as being pressurized.
I. Other Tank Cars

1. Clockwise from top left
   - Covered Hopper (bulk dry goods)
   - Pneumatic hopper (flow-able dry goods)
   - Gondola
   - Box Car
   - Open top hopper
Railroad Tanks Cars
others (cont.)

J. Flat bed with inter-modals (top)
   • COFC (container on flat car)
   • TOFC (tank on flat car)

K. Cryogenic Car (bottom)
L. There are a wide variety of bulk storage tanks

- Top two are low pressure (less than 100 psi)
- The bottom two are designed to handle internal pressures of more than 100 psi?
M. These tanks are found in petroleum tank farms
N. Portable tanks (or totes) can carry more than 400 gallons of product.

- The petroleum storage tanks (center) are examples of Above Ground Tanks in a vault (left), and USTs (Underground Storage Tanks-right).
O. Drums come in all sizes
   • They can be open top or
   • Closed top with bungs for loading.

P. What other containers might be used for storing hazardous materials
   • Cylinders
   • Boxes
   • Bottles
   • Pails
   • et al.

Q. Discuss that some containers may be illegal
   • Pipe bombs
   • WMD Dispersion Devices
Markings and Colorings

- National Fire Protection Association (NFPA) 704 System
- Hazardous Materials Information System (HMIS)

IV. Markings and Colorings

A. Special markings and colors are used for rapid recognition and identification of hazardous materials

B. There are several types of marking systems that utilize colors and markings

C. The main two types of marking systems are:

1. National Fire Protection Association (NFPA) 704 System
2. Hazardous Materials Information System (HMIS)

D. Another such system that utilize colors and markings is

1. UN / NA Identification Numbers
1. National Fire Protection Association (NFPA) 704 System
   • Used primarily on storage tanks and smaller containers at a fixed facility
   • May also be a part of the actual manufacturer’s label on small containers
   • NFPA 704 is a standardized system that uses numbers along with colors on a sign or label to define the basic hazards of that material

   • The four areas it addresses are:
     - Health (blue)
     - Flammability (red)
     - Reactivity (yellow)
     - Special concerns (white)

   **NOTE:** Each is rated 0 – 4

   0 is the least hazardous

   4 is the most hazardous
2. Hazardous Materials Information System (HMIS)

- Similar to the NFPA 704 labeling system
- Uses the same colors and numbers on a label or sign to define the basic hazards
- This system uses a vertically stacked color bar chart to indicate:
  - Health (blue)
  - Fire/Flammability (red)
  - Reactivity (yellow)
  - Personal Protective Equipment to be worn (white)
- Each of the four colors rate the degree of the hazard
  - 0 (zero) is the least hazardous
  - 4 is the greatest hazardous
- White section does not have a numerical scale
- It advise the level of personal protective equipment necessary
  - May be stated verbally in the box
  - By a letter system to identify the PPE requirements derived from a chart on the label
  - May have icons in the box indicating the PPE necessary.
- The example shows PPE recommendations
V. Placards and Labels

A. Placards
   1. Diamond-shaped, 10-¾ inches square
   2. Are required to be displayed on all four sides of a transport vehicle that is carrying hazardous materials
   3. The placard provides information as to the possible presence of hazardous materials
   4. Information is presented in the form of
      • A colored background
      • A symbol at the top
      • A United Nations hazard class number at the bottom
      • Hazard class wording or an identification number in the center

B. Labels
   1. Similar to placards in appearance
   2. Must be securely affixed to packages containing hazardous materials
   3. Should be located near the proper shipping name
   4. Must not be obscured by other markings
C. The United Nations (UN) Hazard Classification System

1. System was devised to provide an international standard of identification for hazardous materials
2. UN hazard classification system is integrated into the Department of Transportation’s warning system for recognition of hazardous materials

D. Components of the UN Hazard Class System

1. Several components of the UN hazard class system are combined on DOT placards or labels
2. Indicate specific properties and warnings of hazardous materials
3. These markings include:
   • UN Hazard Class Number
     – Located in the bottom corner of the placard or label.
   • UN ID Number
     – Required on bulk loads and must be present on the placard
     - Or on an orange sign immediately adjacent to the placard
   • The UN ID must be written on the shipping papers or manifest.
VI. The Nine United Nations Hazard Classes

A. The primary hazard of each chemical can be determined by

1. The hazard class and division that it is shipped under

INSTRUCTOR NOTE: Examples of each class are given; however, at the Hazardous Materials Awareness Level, the student should concentrate on just remembering what the 9 Classes are.
B. Class 1 - EXPLOSIVES

1. Primary hazard is the separation of body parts from an explosion
C. Class 2 COMPRESSED GASES

1. Primary hazard is a pressure explosion

2. Secondary hazard is fire, toxics etc.

3. Every chemical will have more than one secondary hazard but will be shipped under only one primary hazard class

4. Example
   • Gasoline is flammable and poisonous
   • But is shipped only under the flammable hazard class
D. Class 3 FLAMMABLE LIQUIDS

1. Liquids that can ignite and burn
E. Class 4 FLAMMABLE SOLIDS

• Road flares are flammable solids
F. Class 5 OXIDIZERS/ORGANIC PEROXIDES

1. An Oxidizer will allow products that do not normally burn to burn

2. It can allow a product that normally burns to burn explosively

3. Organic Peroxides have both fuel and oxygen in their chemical make-up

4. All they need to ignite is heat
G. Class 6 TOXIC MATERIALS AND INFECTIOUS SUBSTANCES

1. Poisonous, toxic or infectious substances that are not compressed gasses (Class 2)
Class 7 Radioactive materials

- Radioactive
  - Uranium

H. Class 7 RADIOACTIVE MATERIALS

1. Remember the three types of radioactive materials?
   - Alpha
   - Beta
   - Gamma
I. Class 8 CORROSIVES

1. Primary hazard is destruction of tissue and metals
J. Class 9 MISCELLANEOUS

1. Most hazardous wastes are shipped in this class
VII. Associated Placard Colors

A. Colors provide immediate recognition to the possible presence of hazardous materials

B. The following is a list of colors and their associated meaning:

1. Orange – Indicates explosive
2. Red – Indicates flammable
3. Green – Indicates non-flammable gas
4. Yellow – Indicates oxidizing material
5. White – Indicates toxic/poisonous material
6. White with Vertical Red Stripes – Indicates flammable solid
7. Yellow over White – Indicates radioactive material
8. White over Black – Indicates corrosive material
9. Blue – Indicates water reactive substances
Dangerous Placard

• First Responders will have no idea what hazardous materials are being transported when the **DANGEROUS** placard is being used.

C. Dangerous Placard

1. A freight container, unit load device, transport vehicle or rail car which contains bulk packaging with two or more categories of certain hazardous materials that require different placards may be placarded with **DANGEROUS** placards instead of the separate placards for each of the materials.
VIII. Shipping Papers and MSDSs

A. Shipping papers and MSDSs are a very good source of information

B. The problem with ascertaining these papers at the scene of an incident

1. may not accessible to the responder

C. Ask available on-scene personnel if additional copies are available by other means
D. The Shipper Paper

1. Shipping papers will usually have the hazard listed in the following ways:
   - Listed first on the shipping document
   - May be highlighted by a different color
   - May be marked in a special hazardous materials column

2. Shipping papers describe the hazardous materials being transported

3. Shipping orders, bills of lading, and manifests are all shipping papers
E. If a shipping paper describes both hazardous and non-hazardous products, the hazardous materials will be either:

1. Described first.


3. Identified by an "X" placed before the shipping name in a column captioned "HM." The letters "RQ" may be used instead of "X" if a reportable quantity is present in one package.
IX. ACTIVITY 3.1

Material Safety Data Sheet

A. An MSDS is required by law to be available to anyone who requests them

B. An MSDS will give information on the hazard that each product presents

C. An MSDS sheet is a written or printed document about the material being transported

D. The contents of the MSDS will address issues concerning the hazardous chemical which includes:
   1. Go over the two MSDS found in the book.
   2. Stress the follow
      • Name of chemical and or shipping name
      • Emergency response phone numbers
      • NFPA and or HMIS info
      • Hazards and first aid procedures
Human Senses

Never deliberately use your own sense of taste or smell to identify a hazardous material, however don’t forget that a victim or witness may have already used these senses and may be of great benefit if asked what the product smelled like and how they are feeling.

X. Human Senses

A. Odors can indicate the presence of hazardous materials
B. If you can smell a hazardous material it is time to GET OUT!
C. Some odors, such as rotten fruit or eggs or freshly cut grass, are characteristic of certain hazardous materials
D. Clandestine drug labs produce distinct odors dependent on the materials and methods involved drug manufacturing process.
E. Some chemicals may rapidly desensitize your sense of smell
   1. You might smell it on a first sniff, but not on a second or third thereafter
F. The unique color of smoke or flame can help identify the presence of hazardous material.
G. Irritation to the eyes or skin also can be an indication of something hazardous
H. The most important sense that responders have to give indication of a hazardous material release is the sense of hearing. Sounds of hissing, fizzing or whistling are all indications of an escaping gas or reaction. A high pitched sound could indicate the potential for a BLEVE.
UNIT THREE QUIZ

Answer the questions to Unit three’s Test by viewing the following video.
Should start atomatically
Unit Four

The Emergency Response Guidebook

Allow 45 minutes for this section

Completely go over the ERG from cover to cover. Explain each page. Do not forget the pages dealing with initial isolation.

Unit 4 Objectives: At the completion of this unit, the Student will:

- Demonstrate competency in the use of the North American Emergency Response Guidebook (NAERG) by referencing the ERG while watching a video showing a hazardous substance release.
Unit Four Quiz

• Student Manual Page 68
• Answer the questions with information obtained by utilizing the following clip and your ERG

Allow 10 minutes for this test
Notes

Video should automatically start.
The ERG Performance Evaluation

• Appendix C

Notes

This evaluation form verifies the participants ability to use the ERG. It should be administrated by the responsible employer.
Allow 5 minutes for this section

Awareness Level Responders must be aware of who should be contacted in the event of an emergency involving hazardous materials. In addition to notifying the local fire, law enforcement, emergency medical, public health and/or emergency management agencies there are state and federal resources that also can be contacted.

In the book is a partial listing of other agencies that can assist with a HazMat or terrorism incident.

Emphasize that the local responder needs to be notified first.
Unit Six

Recognizing Terrorist Activities

Allow 60 minutes for this unit

Unit 6 Objectives: At the completion of this unit, the student will

• Identify potential sites for a terrorist attack

• Recognize indicators of such an attack

• Become aware of the most common choice for a weapon or bomb

• Identify the role of 1st Responder at a terrorist incident
I. Recognizing Terrorist Activities

A. Responders must stay alert for the possible cause of any hazardous material incident

B. Information received prior to our arrival may indicate possible terrorist involvement

C. There are many venues at which a terrorist can use hazardous materials

D. The following are clues that the first responders can look for to indicate that the incident is not accidental but maybe a terrorism event.
II. Discuss why each venue could be a potential or high profile target

A. Government Buildings

B. Schools

C. Religious Buildings
   1. Synagogues

D. Public Assembly Points
   1. Especially political rallies
   2. Protest sites

E. Mass Transit Systems

F. High Economic Impact Targets
   1. Wall Street
   2. Shopping Centers and Malls
Occupancy (cont.)

- Military installations
- Financial institutions
- Entertainment facilities
- Hospitals
- Utilities
- Places of historical or symbolic significance

Continue discussion

G. Military Installations
   1. Many in Ohio

H. Financial Institutions

I. Entertainment Facilities
   1. Large crowds
   2. Interrupts our daily life

J. Hospitals

K. Utilities
   1. All are equally vulnerable

L. Places of Historical or Symbolic Significance
   1. Ask Group for examples
Type of event

- Political rallies

Timing of the Incident

- Holidays, Birthdays
- Celebrations
- Recent known threats

A. Any large gathering has the potential to create mass casualties
   1. Stresses the local EMS and hospital systems
   2. Secondary target at hospital creates panic by citizens

B. Timing of Incidents
   1. Disrupt our festive mood and atmosphere
   2. Changes the focus of that event for the future

3. Examples:
   - 4th of July
   - Thanksgiving or Christmas
   - Columbine High School massacre
   - Waco Texas
   - Oklahoma City
   - 9/11
III. On Scene Warning Signs

A. It is very important that the First Responder take in all of the surroundings at an incident
   1. There may be very small clues to indicate this incident was intentional

B. First responders should take care not to develop tunnel vision of the hazardous incident at hand
   1. Terrorist groups get immediate media attention when there is a total disruption of the emergency response
   2. This interruption is furthered when they can cause more damage to the responders after they have arrived.

*Instructor Note:* Emphasize that victims are our best clue
IV. Threat and Target Analysis

A. Motivations provide insight into the specific sites that a Potential Threat Element (PTE) may consider as targets.

B. The FBI established five major classifications of threat motivations:

1. Political
2. Religious
3. Racial
4. Environmental
5. Special Interest
Radical Political Activist Groups

- Motivation
- Likely Targets
- Groups
- Incidents

C. Political Groups

1. Motivation
   a. Various theories
   b. Political ideologies
      • Right Wing extremist
      • Left Wing Extremist

2. Likely Targets
   a. Government Institutions
   b. National Leadership/Authority figures
   c. Icons and symbols of government

3. Groups
   a. Anarchists
   b. El Rukn
   c. Mountaineer Militia

4. Incidents
   a. February, 1995 – 4 members of a domestic extremist group (Patriot’s Council) were convicted of manufacturing Ricin
   b. August, 1995 – Mountaineer Militia plotted to destroy the FBI Criminal Justice Information Facility in Clarksburg, WV
   c. October, 1995 – Amtrak train derailed near Hyder, AZ. Sons of the Gestapo claimed responsibility
D. Religious Groups

- Often considered the most dangerous because of their fanaticism
- Willingness to die for their cause.
- They believe they are doing the “work of God” or are on a “holy mission”

1. Motivations and Beliefs
   - Rewards after death
   - Religiously motivated terrorists have committed some of the most horrendous attacks in history

2. Targets
   - Financial Institutions
   - Media
   - Large public venues
   - Churches, Synagogues, Etc.
   - Women’s health facilities

3. Groups
   - Pro-life/Right-to-life groups
   - Branch Davidians (David Koresh)
   - Fundamentalists/Extremists

4. Incidents
   - Reestablishment of a Muslim state and elimination of Western influence (Bin Laden & Al Qaeda)
   - 1998 Attack on embassies in Kenya and Tanzania – 224 lives lost
   - 2000 Attack on the USS Cole 17 killed
   - 1993 and 2001 Attacks on the World Trade Center
   - 2001 Attack on the Pentagon
   - 1984 Rajneesh Cult used salmonella to contaminate a salad bar in Oregon (750 people became ill)
E. Racial Groups

Referred to as “hate groups” these people
- Have a belief in a social order based on the supposed superiority of a particular race.

1. Motivation
   a. Advocate separatism
   b. Persecution or the elimination of other races

2. Targets
   a. Social and legal entities that promote equality among races
   b. Individuals and facilities that represent other races
      • minority churches
      • symbols of racial groups or organizations

3. Groups
   a. National Black United Front
   b. Aryan Nations
   c. National Alliance
   d. Ku Klux Klan
   e. Black Panthers

4. Incidents
   a. Church bombing in Birmingham, AL in 1963
   b. Richard Scott Baumhammers (Pennsylvania atty.) convicted for the murder of five non-white victims in 2001
F. Environmentalists Groups

1. Motivation
   a. Groups or individuals dedicated to slowing down development deemed invasive or damaging to the environment.
   b. These groups commit violent and criminal acts in support of these beliefs

2. Targets
   a. Construction Projects
   b. Mining
   c. Logging or exploration sites
   d. Potential sources of air or water pollution

3. Groups
   a. Earth First
   b. Earth Liberation Front (ELF)

4. Incidents
   a. 1994 Washington State – Earth First members were suspected in an arson fire at a logging company ($350,000 damage)
   b. 1998 Vail, Colorado Earth Liberation Front claimed responsibility for setting fire to various structures ($12 million dollars damage)
G. Special Interest Groups

1. Motivations
   a. Include a variety of causes each with a single focus that are not included in the previous categories
   b. It is important to recognize that not all groups that support these causes are violent

2. Targets
   a. Women’s health facilities
   b. Animal research labs
   c. Technology companies
   d. University research facilities

3. Groups
   a. People for the Ethical Treatment of Animals (PETA)
   b. Animal Liberation Front (ALF)
   c. Anti-abortion
   d. Anti-technology

4. Incidents
   a. Animal Liberation Front targets research facilities that purportedly harm animals or the environment in testing (Incendiary weapons are their choice)
   b. 1996 Olympic Park bombing in Atlanta, GA
   c. Bombing of the Sandy Springs Professional Building
   d. Bombing of the “Otherside Lounge” also in Atlanta
   e. Bombing of a Planned Parenthood clinic in Birmingham, AL
IV. CBRNE & Incendiary Agent Sources

A Likely source of chemical, biological, radiological, nuclear, explosive (CBRNE) or incendiary agents is the home lab.

A. This production method can mean
1. Low concentration, impure, inexpensive materials
2. Or fairly potent agents depending on the process used to produce and purify the product
3. The production can range from
   • Improper canned goods (botulism toxin) or
   • Very complex (nerve gas)
4. Many terrorists rely on laboratories to produce the agent
   • Either buy or steal it from these labs
5. Toxic Industrial chemicals (TICs) can be used as the precursor products in manufacturing chemical agents
   • Relatively easy to steal
   • Are typically sold in bulk
   • Shipped and stored in low security accessible areas.
B. Indicators of WMD Attack
Responders may be called to an incident such as a fire or explosion long before you know it involves a Nuclear, Biological or Chemical agent. Once you have responded to an incident you should be aware of primary and secondary indicators leading to the recognition of a Biological, Chemical or Nuclear use.

1. Primary Indicators
   a. The first indication may be the **symptoms of the victims**
   b. Chemical agents have distinct symptoms that differentiate them from other illnesses
   c. Most biological and some chemicals do not exhibit symptoms until several hours after the initial exposure
   d. Nuclear (radiological) agents may not result in symptoms for days or even years
   e. Another indicator is **mass casualties**, all having severe cases of the same disorder.

2. Casualty patterns
   a. A primary indication you are dealing with an CBRNE agent is if you have an increased number of casualties downwind from the incident.

3. Dissemination device
   a. That deployed the agent
   b. Discovery of a dissemination device that has not yet deployed
   c. Responders should also look at the mechanics of the incident
   d. An observation of an explosion surrounded by an unusual cloud should be regarded as a CBRNE event.

4. Warnings
   a. Issued during an incident, or
   b. Of an impending attack should be taken seriously
   c. Credit of an incident or warning may give indication that a CBRNE agent has been used.
Indicators of WMD Attack (cont.)

- **Secondary Indicators**
  - Dead animals or birds
  - Statements of the victims
  - Things out of place

2. Secondary Indicators
   a. Animals characteristically fall victim to the same agents of an attack as humans, but at lower concentrations and more rapidly
   b. Victims may give statements that would lead responders to recognize the deployment of a biological, chemical or nuclear agent
   c. Responders should pay close attention to the details of the incidents
   d. Anything that appears to be out of place in that immediate area should be regarded as suspicious
   e. Examples would be:
      - Unusual smells,
      - Unknown residue at the scene,
      - Unexplained spills or
      - Unknown liquids.
Recognition of WMD / Hazmat Incident

- Chemical
- Biological
- Nuclear
- Radiological
- Explosive
  ➢ Incendiary

Announcer Slide

We will now discuss terrorist weapons using the CBRNE acronym. Incendiaries will be covered as a subset of explosives
Chemical

- **Recognition**
  - The six clues
  - Victim signs and symptoms
- **Threats & Risks**
  - Usually a liquid when containerized
  - May boil at low temperatures and become gases
  - Normally disseminated as gasses or aerosols
  - Most are influenced by weather conditions

C. Chemical

1. Recognition
   a. The response to a chemical terrorist incident is much the same as the response to hazardous materials
   b. Chapters 1 through 5 gave you a very sound base for awareness level response to a hazardous materials incident
   c. Keep in mind the primary indicators previously discussed in this chapter because you may see immediate victim actions to give you recognition of a chemical attack.

2. Threats & Risks
   a. Generally chemical agents are liquid when containerized
   b. They may boil at low temperatures and become gases
   c. They are normally disseminated as gasses or aerosols
      - Which means they will dissipate with time
   d. Most chemicals are influenced by weather conditions (temperature, wind and humidity)
Chemical (cont.)

• Basic Protection Measures
  - SCBA only
  - PPE
  - Decontamination

3. Basic Protection Measures
   a. Self contained breathing apparatus
   b. Air purifying respirators even equipped with high efficiency particulate absorbing (HEPA) filters, and combined with chemical sorbants (such as what the P100 filter has in the First Responder kit) offer little guaranteed protection. The P100 filter provides protection for escape only.
   c. The Tyvek-F personal protective suit, included in the above mentioned also provides minimal protection and is for escape only.
   d. Decontamination after exposure
      - Includes wetting down exposed suit (skin),
      - Removing clothing,
      - Flushing the entire body with water, and soap if readily available
      - Covering to prevent repeated exposure.

INSTRUCTOR NOTE: Decontamination Procedures will be covered more thoroughly in Unit 7.
D. Biological

1. Recognition
   a. Signs of this type of attack will most likely not be present at the scene or immediately thereafter
   b. The incubation period of biological exposure may be several days
   c. After several days, a large influx of calls for medical service may be seen
   d. Healthcare providers may see a high number of patients with similar signs and symptoms
   e. If you recognize that an event is potentially a biological incident, it is important to notify the local health department who in turn will notify the Ohio Department of Health.
2. Threats & Risks

a. Biological agents are like chemical agents in many ways except for the time it takes for them to make people sick

b. The quality of biological agents and dispersion techniques used dictate the time it takes for agents to take effect

c. Characteristics of biological agents are above
Biological (cont.)

• Basic Protection
  - SCBA
  - APR with HEPA filter
  - Protective clothing
  - Good sanitation
  - Decontamination

3. Basic Protection Measures
   a. Self contained breathing apparatus
   b. Air purifying respirator with high efficiency particulate absorbing (HEPA) filter
   c. Protective clothing and unbroken skin
   d. Good sanitation measures include
      • Not eating or drinking (or smoking?) in the immediate area of the incident
      • Not touching anything suspected as contaminated
      • Washing hands with soap and water after touching anything in an incident
   e. Decontamination after exposure to the area of the incident
      • Remove contaminated clothing
      • Secure it in a plastic bag
      • Shower with soap and water
E. Radiological/Nuclear

1. Recognition
   a. May not be aware of a nuclear radiation dispersion at the time of the incident
   b. Radiation dispersion may consist of
      • A refined powder of radioactive material simply spread around an area
      • Dispersed by an explosive device (these devices are known as “dirty bombs”)
   c. Recognition of this may be a low lying dust cloud around an incident
   d. Once the explosion disperses the material
      • It is intended for respiratory inhalation
   e. Once inside the body, Alpha, Beta and Gamma radiation cause cellular damage to the body, specifically the lungs.

2. Threats & Risks
   a. Between biological, chemical and nuclear radiation, radiation is considered to be the least likely of threats
   b. However, the potential exists
   c. Ionizing radiation is absorbed into our bodies and it can cause changes in our cells
   d. The body can tolerate small amounts of radiation whereas large amounts can be harmful.

As we discussed in chapter Two, there are three basic types of radiation.

- Alpha particles
- Beta particles
- Gamma radiation
Nuclear (cont.)

- Risks
  - The total amount of radiation received
  - The dose rate
  - The specific type of radiation
- Health risks
  - Exposure
  - Ingestion
  - External contamination
  - Internal contamination

e. Risks depend on several factors:
   - The total amount of radiation received (dose)
   - The dose rate (how fast the dose is received)
   - The specific type of radiation

f. Health risks during radiation dispersion are divided into four areas of concern that involve the whole body. These areas of concern are:
   - Exposure
   - Ingestion
   - External contamination
   - Internal contamination
3. Basic Protection Measures
   a. The amount of radiation received depends on
      • The type and strength of radiation
      • Amount of time victims are exposed with or without shielding
      • The distance they are from the source.
         - Time
         - Distance
         - Shielding
   b. Self contained breathing apparatus
   c. Air purifying respirator with high efficiency particulate absorbing (HEPA) filter
   d. Protective clothing
   e. Responders should put distance and shielding between the source area and themselves
   f. The amount of radiation decreases exponentially the further away you are.
   g. Good sanitation measures
   h. Decontamination after exposure
Explosive

• Recognition
  ➢ Vehicles
  ➢ Pipe bombs
  ➢ Satchel devices
  ➢ IEDs

F. Explosive

1. Recognition
   a. Explosives can be made to look like almost anything
   b. Anything that will produce the desired effect can be utilized
      • Vehicles can be used because of their size and mobility
      • Pipe bombs are common type because of their simplicity
      • Satchel devices
         - backpacks with explosives in a portable concealed container
      • Improvised devices can be any device that produce a fragmentation, thermal or blast pressure of desired proportion
2. Threats & Risks

a. Bombs are the weapon of choice for terrorists
   - Statistics show that about 70% of all terrorist incidents involve the use of explosives
   - Explosives can be improvised to deliver an assortment of harm or destruction
   - As a vehicle for chemical, biological, incendiary and nuclear agents.

b. Two basic classifications for explosives
   - High-order explosives - burn above 3,300 feet per second
     - create a very destructive blast pressure
   - Low-order explosives - burn below the 3,300 feet per second rate
     - slower rate makes them good for container bombs, (such as pipe bombs), and fragmentation because of the gradual build-up of pressure.

c. Three effects of explosives (no matter whether they are high-order or low-order)
   - Blast pressure (positive & negative)
   - Fragmentation
   - Thermal effects

d. Positive blast pressure is initially created by the rapid expansion of gases

e. Negative pressure can result in death because of rapid lung expansion

f. Fragmentation
   - Pieces of the container
   - Items surrounding the explosive for propulsion

g. Thermal effects (also known as the incendiary effect)
   - The heat produced by rapid burning of the explosive when detonated
   - Thermal effects are usually local to the explosion
   - Very short lived with conventional devices.
Explosive (cont.)

- **Basic Protection Measures**
- **Watch out for:**
  - Abandoned containers
  - Incidents preceded by a written or verbal threat
  - Trip wires / booby traps
  - Suspicious mailings
  - Strong chemical odors
  - Devices containing unknown items
  - Multiple explosions

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3. **Basic Protection Measures**

a. Protection measures basically are preventive in nature

b. Anything that is suspicious should be treated with the utmost respect

c. Outward warning signs that there might be an explosive could include:
   - **See Slide**
Incendiary

- **Recognition**
  - Road flares
  - Gasoline and motor oil
  - Light bulbs
  - Common electrical components
  - Matches
  - Household chemicals
  - Fireworks
  - Propane and butane cylinders
  - Plastic pipes, bottles and cans

G. Incendiary

1. **Recognition**
   a. Incendiary devices may look a lot like explosives at first glance
   b. Their form and visual composition may be similar
   c. However, there are many that do not look like an incendiary device
      - An example would be a hijacked 757 airplane, such as those used against the World Trade Center on **September 11, 2001**
      - Items used to make an incendiary device may include the above:
2. Threats & Risks

a. Incendiary devices use fire as the mechanism for damage (fire continues to do damage if there is fuel to consume)

b. Basic types of incendiary devices are divided into three categories based on the triggering mechanism:
   • Chemical
   • Electronic
   • Mechanical

c. Delivery of incendiary devices are divided into three basic groups
   • Hand thrown devices
   • Stationary devices are placed in targets with timed mechanisms for deployment
   • Propelled devices are shot or propelled under their own sources of propulsion into targets
Incendiary (cont.)

- **Basic Protection Measures**
  - PPE
  - Observation of:
    - Secondary timed devices
    - Multiple fire locations
    - Signs of accelerants
    - Flammable liquid containers
    - Splatter patterns
    - Fusing residue

3. Basic Protection Measures

a. This may include obvious or not so obvious mechanisms

b. Responders should look for clues prior to and during a response to
   - An incendiary deployment
   - Or potential deployment

c. Personal protective measures to be taken by responders include
   - Observation of secondary timed devices
   - Multiple fire locations
   - Signs of accelerants
   - Flammable liquid containers
   - Splatter patterns
RESPONDERS SHOULD ALWAYS BE OBSERVANT OF SECONDARY DEVICES!!

INSTRUCTOR NOTE: Emphasize this
V. Potential Outcomes for Terrorist CBRNE & Incendiary Events

A. Effective execution of a terrorist attack may result in thousands of casualties

B. Casualties may carry residual contamination on their clothing into emergency medical vehicles and care should be taken to prevent this

C. The use of CBRNE agents in a terrorist attack can overwhelm emergency services and responders

D. Of all the response efforts, the most difficult can be cleanup efforts

E. Normal municipal functions can be disrupted
   1. Need to evacuate and isolate the affected area
   2. This area may be isolated from reoccupying for several weeks, if ever
   3. This disruption can lend to panic and confusion
   4. The public may lose faith in response efforts of the local, state or federal government.
Role of the First Responder Awareness at WMD / Hazmat Incident

- Recognition and identification
- Protect themselves and others
- Notify authorities

VI. Role of the First Responder Awareness at CBRNE / Incendiary / WMD / Hazmat Incident

A. The role of the First Responder at the Awareness Level

1. Make use of rapid recognition and identification of
   a. A hazardous material
   b. CBRNE weapon of mass destruction

2. Responders make this rapid assessment
   a. Take the appropriate action to protect themselves
   b. Protect others by isolating the incident

3. After isolating the incident, it is the responsibility of the responder to notify authorities to mitigate the incident
Basic Isolation Procedures for WMD / Hazmat

• Isolate the area for protection and pending arrival of proper authorities.

B. Basic Isolation Procedures for CBRNE / Incendiary / WMD / Hazmat

1. Isolation of CBRNE WMD incidents do not vary much from standard hazardous material isolation

2. The only difference is when the recognition of a CBRNE incident will come to light

3. By following the Emergency Response Guidebook you can effectively isolate the area for protection and arrival of proper authorities.
C. Protection of CBRNE Crime Scene

1. Remain extremely vigilant during any suspected response to a WMD incident

2. Everything may be an important piece of evidence

3. Try to retain the evidentiary value of anything in or around the scene during the incident

4. Do not disturb anything unless someone’s life is in danger
   a. You never know what might give the final clue to investigators leading to the person or group responsible.

5. After the incident
   a. Document your activities as soon as possible
   b. You may be called to testify regarding the location of items or persons, sounds and/or smells and thoughts you had during the response effort.
Additional Contacts during WMD Incident

• Who are you going to call?
  ➢ FBI
  ➢ State Responders

D. Additional Contacts during CBRNE Incident

1. Make a plan
   a. List the people and organizations in and around your area that you may need to contact during a WMD threat or event

   b. Making the appropriate contacts after you have developed your list is essential
      • So that resources are aware of your intent to contact them
      • Your networking capabilities will be enhanced, making you more adaptable to diversity.
UNIT SIX QUIZ

Allow 10 minutes for the test
Unit Seven
Decontamination

Allow 10 minutes for this unit
Can First Responders Do Decon!

• If it can be done safely!
• Contaminated live victims should receive immediate emergency decon.

Live Patients Can’t Wait for Technical Decon to Arrive!

I. Emergency Decontamination

A. First responders may encounter contaminated victims at the scene of a hazardous materials incident and could potentially become contaminated themselves

1. Individuals contaminated during an incident must be immediately decontaminated

2. Isolated from other people to prevent further injury and spread of the product

3. Proper first aid cannot be given to contaminated victims, they must first be decontaminated.
A. The four types of Decontamination

1. Emergency
2. Mass
3. Technical
4. Hospital

B. Emergency and Mass Decon are the only two options available to the 1st Responder
D. Emergency Decontamination Procedure

1. If no fire personnel are on the scene
   • perform emergency decontamination using copious amounts of water from any source available.

2. Receiving medical facilities and EMS personnel should be notified of any people possibly still contaminated, since emergency decontamination not as thorough as regular decontamination.
Emergency Gross Decon

- Ambulatory Patients Should Receive Directed Self-Decon
- Use tepid, low pressure water
- Remove Clothing - 80% of contaminant is on clothing

Instructor Note: Use Slide
Emergency Gross Decon

- Avoid overspray & splashing
- If corrosives, flush affected area for 15-20 minutes
- Control Runoff, if possible. If not, then grassy area.

Instructor Note: Use Slide
Transport

- Always provide Gross Decon before Transport
- Minimize Secondary Respiratory Threat
- **DO NOT** cover doors and windows
- Open Windows, Vents and Exhaust to Exchange Air

Instructor Note: Use Slide
Emergency vs. Mass Decon

Mass Decon is Emergency Decon for More People!

Instructor Note: Use Slide
Main Purposes of Mass Decontamination

- Protect response and medical personnel
- Remove chemical agent from Contaminated victims
- Limit spread of contamination

Instructor Note: Use Slide
Time is Critical!

- That will cause the least harm
- Use the fastest approach
- And do the most good
- For the majority of the people!

E. Because Time is Critical

1. Use a Decon Procedure that will
   • Cause the least harm
   • Be the fastest approach
   • Do the most good
   • Help the most people
Mass Casualty Decon General Principles

- Expect at least a 5:1 ratio of unaffected to affected casualties
- Decontaminate victims as soon as possible
- Disrobing (head to toe) is decontamination, more removal is better

Instructor Note: Use Slide
Mass Casualty Decon General Principles

- Water flushing generally is the best mass decon method
- After a known exposure to a chemical agent, emergency responders should be decontaminated as soon as possible.
Decontamination for Contaminated First Responders

- Contaminated clothing and equipment must be bagged and tagged

F. Contaminated First Responder Decontamination

1. First Responders who have been contaminated but are not in need of immediate medical attention
   - Report to an established decontamination area
   - Contaminated clothing, equipment and accessory items must be left at the decontamination area

2. The decontamination procedure should be familiar to the Awareness Level First Responder
   - So they know what to expect in the event that they need to be decontaminated
   - Or if they are performing emergency decontamination.
Appendix A: Personal Protective Equipment (PPE)

Instructor Note: If students are issued PPE, allow 2 hours for this unit; If students are not going to receive PPE, allow 20 minutes for this unit

Objectives: At the completion of this unit, the student will:
•Recognize the 4 levels of hazardous materials PPE
•Understand the limits of each
•At the Awareness Level, Be fully aware the PPE distributed by the SOSTF is for escape, only

•Demonstrate the ability to don and doff PPE including APR, if supplied
•Demonstrate the ability to inspect PPE including APR, if supplied
I. Personal Protective Equipment (PPE)

A. Personal protective equipment (PPE) is the general term given to the protective clothing that is worn during a response to an incident.
Levels of Protection

**LEVEL A**

- Vapor tight suit
- SCBA or Supplied Air
- HIGHEST LEVEL OF PROTECTION

II. Levels of Protection

A. Level A is the highest level of protection

1. Entry Teams trained to the Technician Level

2. Clean-up companies
Levels of Protection

**LEVEL B**

- Splash Suit
- SCBA or Supplied Air
- Next to highest level of protection

B. Level B is the next highest level of protection

1. Entry Teams trained to the Technician Level

2. Clean-up companies
Levels of Protection

LEVEL C

- Splash Suit
- Cartridge or canister APR
- Minimal level of protection

C. Level C Protection

1. Difference between Level B and Level C
   a. Level of respiratory protection
      • Level B – supplied air or SCBA
      • Level C – Air Purifying Respirator (APR)
Levels of Protection

**LEVEL D**

- Work uniforms
- Minimum protection

D. Level D Protection

1. Little or no protection
E. KNOWING THE SUIT'S LIMITATIONS IS IMPORTANT FOR THE SAFETY OF THE RESPONDER
II. State of Ohio Security Task Force

A. The State of Ohio Security Task Force (SOSTF) has made available the First Responder Kit for escape from a hazardous materials incident
E. As stated previously

1. Awareness Level training and Personal Protective Equipment for the first responder at the Awareness Level
   a. Provides minimal protection
   b. Donning the APR is for escape measures ONLY!!
CAUTION!

IN NO WAY DOES THIS EQUIPMENT INCREASE THE ROLE AND RESPONSIBILITY OF THE FIRST RESPONDER LEVEL AS DEFINED!

3. IN NO WAY DOES THIS EQUIPMENT INCREASE THE ROLE AND RESPONSIBILITY OF THE FIRST RESPONDER LEVEL AS DEFINED!
Respiratory Protection Standards

**OSHA** – employers are required to develop and implement a written respiratory protection program

*(29 CFR 1910.134)*

### III. Standards

A. Ohio is an OSHA State as of 1996

1. Police, Fire, and EMS are exempt in some cases

2. Not exempt with regards to hazardous materials
   a. Response
   b. Training

3. Not exempt from respiratory protection requirements
   a. Policy
   b. Fit Tests
Personal Protective Equipment (PPE) Program

Must consist of the following criteria:

- Policy & Procedures
- Selection criteria for PPE
- Maintenance & Storage
- Decon & Disposal
- Training & Fitting

B. PPE Program must consist of:

1. Policy & Procedures
2. Selection criteria for PPE
3. Maintenance & Storage
4. Decon & Disposal
5. Training & Fitting
Personal Protective Equipment (PPE) Program

Additionally:
• Donning & Doffing Procedures
• Inspection Procedures
• PPE Hazards & Limitations
• Program Elevation

B. PPE Program must also contain:

6. Donning & Doffing Procedures

7. Inspection Procedures

8. PPE Hazards & Limitations

9. Program Elevation
PPE & Respiratory Protection Training

When you are provided with the First Responder Kit for hazardous materials response, you will be “fit-tested” and given further training in the use of this equipment.

C. PPE and Respiratory Training

1. When you are provided with the First Responder Kit for hazardous materials response, you will be “fit-tested” and given further training in the use of this equipment.