The Maryland Fire and Rescue Institute of the University of Maryland is the State’s comprehensive training and education system for all emergency services.

The Institute plans, researches, develops, and delivers quality programs to enhance the ability of emergency service providers to protect life, the environment, and property.
Objective
Given information from discussion, handouts, and reading materials, describe the role of first responders in dealing with a hazardous materials or weapons of mass destruction incident.

Overview
- Hazardous materials
- Levels of training
- Regulations and agencies
- Preplanning
Hazardous Materials

Explosion in Ghent, WV

https://www.youtube.com/watch?v=JzdnUZReoLM

Substance or material capable of posing an unreasonable risk to human health, safety, or the environment when transported in commerce, used incorrectly, or not properly contained or stored

Weapons of mass destruction

Hazard
Levels of Training

- Regulations
  - Issued and enforced by the government
    - OSHA
    - EPA
- Standards
  - Issued by nongovernmental entities
    - NFPA
  - Based generally on consensus

Levels of Training

- Awareness
- Operations
- Technician
- Incident commander

Levels of Training

Awareness level personnel
**Regulations and Agencies**

- SARA
  - Superfund Amendments and Reauthorization Act
- EPCRA
  - Emergency Planning and Community Right-to-Know Act
- LEPC
  - Local Emergency Planning Committee

**Regulations and Agencies**

- SERC
  - State Emergency Response Commission
- EPA
  - Environmental Protection Agency
- DOT
  - Department of Transportation
- FBI
  - Federal Bureau of Investigation
- DHS
  - Department of Homeland Security

**Preplanning**

- Targeting hazards
- Threat assessment and response
- Coordinated planning
  - By all agencies and departments
Given information from discussion, handouts, and reading materials, describe the role of first responders in dealing with a hazardous materials or weapons of mass destruction incident.

- Hazardous materials
- Levels of training
- Regulations and agencies
- Preplanning
Objective
Given information from discussion, handouts, and reading materials, describe how to recognize and identify hazardous materials and WMD at an emergency incident.

Overview
- Scene size-up
- Containers
- Markings
- Routes of entry
Containers

Cylinders

Markings

Safety data sheets

Markings

NFPA 704 Marking System
Given information from discussion, handouts, and reading materials, describe how to recognize and identify hazardous materials and WMD at an emergency incident.

- Scene size-up
- Containers
- Markings
- Routes of entry
Objective
Given information from discussion, handouts, and reading materials, understand the chemical and physical properties of the substances involved in a hazardous materials incident.

Overview
- Physical and chemical changes
- Critical characteristics
- Hazard, exposure, and contamination
- Health effects
Physical and Chemical Changes

Causes of chemical reactions

- Thermal stress
- Chemical stress
- Mechanical stress

Thermal stress

Chemical stress
Physical and Chemical Changes

Mechanical stress

Physical and Chemical Changes

• Causes
  ➢ Temperature
  ➢ Pressure
  ➢ Expansion ratio
  ➢ Chemical reactivity

Physical and Chemical Changes

BLEVE

https://www.youtube.com/watch?v=UM0jtD_OWLU
Critical Characteristics

- **Flash point**
  - Minimum temperature that a liquid will give off sufficient vapors to ignite spontaneously

- **Ignition temperature**
  - Minimum temperature that a liquid will give off sufficient vapors to ignite spontaneously

**Table 2-1: Flammable Ranges of Common Gases**

<table>
<thead>
<tr>
<th>Gases</th>
<th>Flammable Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen</td>
<td>4.0%-75%</td>
</tr>
<tr>
<td>Natural gas</td>
<td>5.0%-15%</td>
</tr>
<tr>
<td>Propane</td>
<td>2.1%-9.6%</td>
</tr>
</tbody>
</table>

Flammable range (explosive range)
Critical Characteristics

- Lower explosive limit (LEL)
  - Minimum concentration of a flammable vapor in air that will ignite
- Upper explosive limit (UEL)
  - Maximum concentration of a flammable vapor in air that will ignite

Atmospheric Assessment

- Corrosives
- Oxygen content
  - Normal atmospheric oxygen content is 21%
  - OSHA/MOSH minimum oxygen content is 19.5%
  - Oxygen enriched atmosphere is > 23.5%
- Flammability

Critical Characteristics

FLAMMABILITY

- Flammable range

Flammable range
Critical Characteristics

- Vapor pressure
  - Liquid held inside a closed container

Critical Characteristics

- Atmospheric pressure pushes down at 14.7 psi
- Water boils at 212°F

Boiling point

Critical Characteristics

- Vapor density
  - Vapor weight compared to air weight
### Critical Characteristics

- Hydrogen
- Helium
- Hydrogen cyanide
- Hydrogen fluoride
- Methane
- Ethylene
- Diborane
- Illuminating gas
- Carbon monoxide
- Ammonia
- Neon
- Nitrogen
- Acetylene

### Specific Gravity

- Water solubility
  - Ability to dissolve in water
**Critical Characteristics**

- **Corrosivity**
  - Ability to cause damage
Critical Characteristics

- Toxic products of combustion
  - Materials decompose under heat resulting in hazardous chemical compounds

Critical Characteristics

Radiation

Hazard, Exposure, and Contamination

Material capable of posing an unreasonable risk to health, safety, or the environment
**Hazard, Exposure, and Contamination**

Exposure

How people, animals, the environment, and equipment are subjected to or come into contact with a hazardous material.

Contamination

Transfer of a hazmat from its source to people, animals, the environment, or equipment and the presence of residue from a released chemical.

Secondary contamination

Person or object transfers the contaminant or the contamination source to another person or object by direct contact.
**Health Effects**

- Chronic health effects
  - Appear after long-term exposure
  - Appear after multiple short-term exposures
- Chronic exposures
  - Produce chronic health effects
  - Long-term or many short-term exposures

---

**Health Effects**

- Acute health effects
  - Occur after short, acute exposure
- Acute exposures
  - Produce observable conditions

---

**Health Effects**

- Toxicity
  - The degree to which something is toxic or poisonous and the effects of the exposure to a substance
Health Effects

- Lethal dose
  - Single dose causing the death of a specified number of test group animals exposed by any route other than inhalation
- Lethal concentration
  - Concentration in the air

Objective

Given information from discussion, handouts, and reading materials, understand the chemical and physical properties of the substances involved in a hazardous materials incident.

Review

- Physical and chemical changes
- Critical characteristics
- Hazard, exposure, and contamination
- Health effects
Objective
Given information from discussion, handouts, and reading materials, describe how to recognize and identify hazardous materials and WMD at an emergency incident.

Overview
• Containers
• Hazmat transport
• Reference sources
• Potential terrorist incidents
Train explosion in Texarkana

Containers

Drums

Dewars containers
Containers

IM-102 portable tanks (IMO type 2)

Pressure intermodal tanks (IMO type 5/DOT Spec 51)

Cryogenic intermodal tanks (IMO type 7)
Containers

Tube modules

Intermediate bulk containers

Hazmat Transport

- Air
- Sea
- Land
- Combination of methods
Special-use railcars

Reference Sources

- CHEMTREC
  - Chemical Transportation Emergency Center
- NRC
  - National Response Center

Reference Sources

- Digital applications
  - WISER
  - AskRail
  - Cargo Decoder
  - SAFER Mobile Response
Potential Terrorist Incidents

- Responding
  - Be familiar with the potential target locations in the area
  - Make risk-based decisions based on specific criteria

Initial actions

Interagency coordination
Potential Terrorist Incidents

- Types of terrorist hazards
  - Chemical agents
  - Biological agents
  - Radiological agents
  - Illicit laboratories
  - Explosives

Potential Terrorist Incidents

- Chemical agents
  - Nerve agents

Potential Terrorist Incidents

- Biological agents
  - Anthrax
  - Plague
  - Ricin
  - Smallpox
Potential Terrorist Incidents

- Secondary devices
  - Used in incidents such as the Sandy Springs, Ga., abortion clinic bombing and the Otherside Lounge bombing

Objective

Given information from discussion, handouts, and reading materials, describe how to recognize and identify hazardous materials and WMD at an emergency incident.

Review

- Containers
- Hazmat transport
- Reference sources
- Potential terrorist incidents
Lesson 5-1: Estimating Potential Harm and Planning a Response

Objective
Given information from discussion, handouts, and reading materials, describe how to protect yourself and others by estimating the potential harm or severity of an emergency incident.

Overview
- Harm or severity estimation
- Exposures
- Initial response planning
- Personal protective equipment (PPE)
- Hazmat PPE
- Chemical-protective ratings
- Respiratory protection
- Decontamination
Harm or Severity Estimation

- Personal safety
- Protect life safety of victims
- Life safety considerations
- Material considerations

Priorities

- OSHA
  - PEL (Permissible exposure limit)
- ACGIH
  - TLV/TWA
    - Threshold limit value/time weighted average
  - TLV/STEL
    - Threshold limit value/short-term exposure limit
  - TLV/C
    - Threshold limit value/ceiling
- NIOSH
  - REL (Recommended exposure limit)

- Threshold limit value/skin
- IDLH
  - Immediately dangerous to life and health
- Atmosphere safety
**Harm or Severity Estimation**

- **Resources**
  - ERG
  - Computer programs

**Types**

- People
- Property
- Environment

**Initial actions**
Exposures

Initial actions

Initial Response Planning

• Develop response objectives
  ➢ Measureable
  ➢ Flexible
  ➢ Time-sensitive
  ➢ Offensive
  ➢ Defensive
  ➢ Nonintervention

Response objectives
Personal protective equipment

- Performance standards
  - NFPA standards on hazmat PPE
    - NFPA 1991
    - NFPA 1992
    - NFPA 1994
  - OSHA HAZWOPER
    - 29 CFR 1910.120, Appendix B

Maintaining PPE

- Maintenance based on
  - Manufacturer requirements
  - Local procedures
Hazmat PPE

- Street clothing
- Work uniforms

Hazmat PPE

- Structural firefighting protective clothing

Hazmat PPE

- High-temperature protective clothing and equipment
Chemical-protective clothing and equipment

Chemical-protective Ratings

- Level A
  - Vapor-protective

Chemical-protective Ratings

- Level B
  - Chemical-protective
  - NFPA 1994 Class 2
Chemical-Protective Ratings
• Chemical-resistant
• NFPA 1994 Class 3

Level C

Chemical-Protective Ratings
• NFPA 1994 Class 4

Level D

Respiratory Protection
• NFPA 1994
  Developed to address the performance of protective ensembles and garments specific to WMD
Respiratory Protection

• SC BA
  ➢ Positive-pressure, self-contained breathing apparatus

Respiratory Protection

• SARs
  ➢ Supplied-air respirators

Respiratory Protection

Closed-circuit SC BA
Respiratory Protection

- APRs
  - Air-purifying respirators

Respiratory Protection

- PAPRs
  - Powered air-purifying respirators

Decontamination

Contamination
Given information from discussion, handouts, and reading materials, describe how to protect yourself and others by estimating the potential harm or severity of an emergency incident.
Review

- Harm or severity estimation
- Exposures
- Initial response planning
- Personal protective equipment (PPE)
- Hazmat PPE
- Chemical-protective ratings
- Respiratory protection
- Decontamination
Given information from discussion, handouts, and reading materials, describe how to control the scene of a hazmat/WMD incident and take the initial response actions.

Objective

Overview

- Response safety procedures
- Operations level protective actions
- Incident command system
- Operations level responder
Response Safety Procedures

- Isolate the release
- Identify chemical’s physical properties
- Consult the ERG
- Establish control zones
- Consider evacuation vs. shelter-in-place
- Render emergency medical care
- Identify/secure possible ignition source

Basic protective actions

Response Safety Procedures

- Determine type of harm
  - Thermal
  - Radiological
  - Asphyxiating
  - Chemical
  - Biological/biological
  - Mechanical
  - Psychogenic

DECIDE

TRAC EMP
Response Safety Procedures

• CAN report
 ➢ Conditions
 ➢ Actions
 ➢ Needs

Establish control zones

Operations Level Protective Actions

• Evacuation
 ➢ Nature of the hazard
 ➢ Exposures anticipated
**Operations Level Protective Actions**

- **Sheltering-in-place**
  - Safeguarding in a hazardous area by keeping people in an enclosed atmosphere

- **Search and rescue**
  - Victims are removed to the warm zone for gross/emergency decontamination

- **Safety briefings**
  - Written site safety plan
  - Verbal safety briefing
Operations Level Protective Actions

• Buddy system
  ➢ Never allow responders to operate alone
  ➢ Always have two or more responders enter a contaminated area
  ➢ Follow OSHA HAZWOPER regulations on entry requirements

• Backup personnel
  ➢ Same level of protection as entry team
  ➢ Required by OSHA HAZWOPER regulations
  ➢ Team of at least two
  ➢ Ready for immediate deployment

• Excessive-heat disorders
  ➢ Heat exhaustion
    • Mild form of shock
  ➢ Heat stroke
    • Severe and potentially fatal
**Operations Level Protective Actions**

- **Cold-temperature exposures**
  - Caused by
    - Released materials
    - The environment
  - Prevented by
    - Keeping clothing next to skin dry

---

**Operations Level Protective Actions**

- **PPE physical capability requirements**
  - Pre-entry medical screening
  - Post-entry medical screening

---

**Incident Command System**

- **Benefits of using ICS**
  - Common terminology
  - Consistent organization structure
  - Consistent position titles
  - Common incident facilities
Incident Command System

- Used when multiple agencies with overlapping jurisdictions or legal responsibilities are involved in the same incident

Unified command

---

Incident Command System

- Command staff
  - Command
  - Safety officer
  - Liaison officer
  - Public information officer

---

Incident Command System

- Incident command post
  - Hot Zone
  - Warm Zone
  - Cold Zone
  - Decontamination Corridor
  - Command Post
Incident Command System

- Led by the operations section chief
- Consists of:
  - Groups and divisions
    - Hazardous materials group
  - Hazardous materials branches
    - Hazardous materials group supervisor
    - Entry team
    - Decontamination team
    - Technical reference team
    - Safety officer

Planning

- Led by the planning section chief
- Responsible for the collection, evaluation, dissemination, and use of information relevant to the incident
Incident Command System

- Led by the logistics section chief
- Responsible for providing incident facilities, services, and materials

Logistics

Incident Command System

- Tracking incident related costs
- Handling procurement issues
- Recording responders’ on-scene time
- Keeping incident running costs
- Handling injury claims

Finance

Putting it all together
Operations Level Responder

• Integral part of the response plan
• Familiar with emergency response plans
• Knows different levels of response

Objective

Given information from discussion, handouts, and reading materials, describe how to control the scene of a hazmat/WMD incident and take the initial response actions.

Review

• Response safety procedures
• Operations level protective actions
• Incident command system
• Operations level responder
Objective
Given information from discussion, handouts, and reading materials, describe the hazards of smoke as well as monitor the work environment for harmful gases.

Overview
• Fire smoke
• Silent killers
• Postfire detection and monitoring
• Fire scene detection and monitoring
Carbon monoxide & hydrogen cyanide

Silent Killers

- Paris, France
- Dallas County, Texas

### Hydrogen cyanide

- Incapacitates victims, preventing escape
- Affects oxygen transportation in the body
- Causes cyanide toxicity

### Carbon monoxide

- One of the most common industrial hazards
- Binds onto red blood cells, preventing oxygen from binding, causing hypoxia
Remember the silent killers

Postfire Detection and Monitoring

• Why use detection devices at the fire scene?

Common technologies
  ➢ Electrochemical sensors

Operational guidance
  ➢ AHJ-developed
Objective
Given information from discussion, handouts, and reading materials, describe the hazards of smoke as well as monitor the work environment for harmful gases.

Review
• Fire smoke
• Silent killers
• Postfire detection and monitoring
• Fire scene detection and monitoring
Objective
Given information from discussion, handouts, and reading materials, describe how to monitor the working environment for harmful gases and how this plays into the importance of detection and monitoring devices.

Overview
- Detection and monitoring
- Detectors and monitors
Detection and Monitoring

• Ensuring that a detection/monitoring instrument will respond appropriately to a predetermined concentration of gas

Calibration

Detection and Monitoring

• Bump test
  ➢ Qualitative function check where a challenge gas is passed over the sensor(s) at a concentration and exposure time sufficient to activate all alarm indicators to present at least the lower alarm setting

Detection and Monitoring

• Reaction time (response time)
  ➢ Expression of the time from when an air sample is drawn into a meter until the meter processes the sample and provides a reading
Detection and Monitoring

• Recovery time
  ➢ Amount of time it takes a detector/monitor to clear so a new reading can be taken

Detection and Monitoring

• Lower explosive limit (LEL)
  ➢ Lowest volume concentration of a combustible gas or vapor that when mixed with air will ignite creating a fire or explosion

Detection and Monitoring

• Relative response curve
  ➢ Accounts for the different types of gases and vapors that might be encountered other than the one used for calibration of a flammable gas detector/monitor
Detection and Monitoring

- Relative response factor
  - A mathematical computation completed for a detector to correlate the differences between gas that is used to calibrate the device and gas that is being detected in the atmosphere

Detection and Monitoring

- Concepts and unknowns

Detectors and Monitors
Given information from discussion, handouts, and reading materials, describe how to monitor the working environment for harmful gases and how this plays into the importance of detection and monitoring devices.
Review

- Detection and monitoring
- Detectors and monitors
Objective
Given information from discussion, handouts, and reading materials, describe and demonstrate the proper use of PPE for hazmat incidents.

Overview
• Single-use vs. reusable PPE
• Maintaining PPE
• Determining PPE needs
• Specific PPE for hazmat response
• Safety
• Reporting and documenting
Single-use vs. Reusable PPE

- Single-use PPE
  - Less expensive
  - Must be restocked

- Reusable PPE
  - Can be reused
  - Tested at regular intervals and after use

Maintaining PPE

- Cleaning
- Disinfecting
- Storing
- Inspecting
- Following manufacturer's recommendations

Determining PPE Needs

- TRACEMP can be used to help determine the type of harm and type of PPE to be used
  - Thermal
  - Radiological
  - Asphyxiating
  - Chemical
  - Biological/biological
  - Mechanical
  - Psychogenic
Specific PPE for Hazmat Response

Level D ensemble

Respiratory protection

• SAR
  > Supplied-air respirators with escape cylinder
• SCBA
  > Positive pressure, self-contained breathing apparatus
• PAPR
  > Powered air-purifying respirator
• APR
  > Air-purifying respirator

Supplied-air respirators with escape cylinder (SAR)
Specific PPE for Hazmat Response

Self-contained breathing apparatus (SCBA)

Powered air-purifying respirator (PAPR)

Air-purifying respirator (APR)
Safety

• Chemical-protective equipment performance requirements
• Responder safety
• Mitigation of PPE issues

In-suit cooling technologies

Reporting and Documenting

• AHJ reporting requirements
• Exposure reporting
Objective
Given information from discussion, handouts, and reading materials, describe and demonstrate the proper use of PPE for hazmat incidents.

Review
- Single-use vs. reusable PPE
- Maintaining PPE
- Determining PPE needs
- Specific PPE for hazmat response
- Safety
- Reporting and documenting
Objective
Given information from discussion, handouts, and reading materials, describe how to perform technical decontamination.

Overview
• Decontamination types
• Technical decontamination
• Methods
• Process
Decontamination Types
The physical/chemical process of reducing and preventing the spread and effects of contaminants to people, animals, the environment, or equipment involved at hazardous materials/WMD incidents.

Mass decontamination

Technical decontamination
Decontamination Types

Emergency/gross decontamination

Technical Decontamination
The planned and systematic process of reducing contamination to a level that is as low as reasonably achievable (ALARA)

Methods
Absorption
Methods

• Dilution

Disinfection

- Used to inactivate all recognized pathogenic microorganisms
- Will not inactivate all microbial forms

Methods

• Evaporation
Methods

Neutralization

• Solidification
  ➢ Chemically treating a hazardous liquid to turn it into a solid material
  • Easier to handle

Methods

• Sterilization
  ➢ The use of a physical or chemical procedure to destroy all microbial life
Methods

Isolation and Disposal

Technical decontamination

Process

Should take place within a predesignated contamination corridor located within the warm zone

Technical decontamination
Process

• Evaluating effectiveness
  ➢ Completed at end of decontamination line
  ➢ Based on the contaminant’s nature
  ➢ Checks for decontamination effectiveness
  ➢ Includes a visual inspection

Technical decontamination

Process

• Reports and documentation
  ➢ Names of persons arriving and processed through the decontamination corridor
  ➢ Released substance information
  ➢ Potential acute and chronic health effects
  ➢ Actions taken to limit exposure
  ➢ Description of decontamination activities
  ➢ PPE breaches or failures

Objective

Given information from discussion, handouts, and reading materials, describe how to perform technical decontamination.
Review

• Decontamination types
• Technical decontamination
• Methods
• Process
Lesson 9-2: Mass Decontamination

Objective
Given information from discussion, handouts, and reading materials, describe how to perform mass decontamination.

Overview
- Mass decontamination
- Evaluating effectiveness
- Reference sources
- Crowd control
- Evidence preservation
- Reports and documentation
Physical process of reducing or removing contaminants from large numbers of victims in potentially life-threatening situations in the fastest time possible.
Reference Sources

- ERG
- Placards
- Labels
- Online databases
- Medical reference books
- Poison control centers
- ATSDR
  - Agency for Toxic Substances & Disease Registry
- CHEMTREC

Crowd Control

Efforts should be aimed at getting the crowd to behave in a manner that is beneficial to the mass decontamination operation

Evidence Preservation
Reports and Documentation

• Decontaminated persons’ names
• Known substance information
• Level of protection worn by responders
• Actions to limit exposures to others
• Decontamination activities’ descriptions
• Collected evidence or samples
• Scene observations

Objective

Given information from discussion, handouts, and reading materials, describe how to perform mass decontamination.

Review

• Mass decontamination
• Evaluating effectiveness
• Reference sources
• Crowd control
• Evidence preservation
• Reports and documentation
Objective
Given information from discussion, handouts, and reading materials, describe the proper use of confinement and containment techniques for released hazardous materials and transition to the recovery phase.

Overview
• Control options
• Recovery
Control Options

Absorption

Control Options

Adsorption

Control Options

Damming
Control Options

Diking

Control Options

Dilution

Control Options

Diversion
Control Options

Vapor suppression

Recovery

Recovery phase

Recovery

Recovery phase
Objective

Given information from discussion, handouts, and reading materials, describe the proper use of confinement and containment techniques for released hazardous materials and transition to the recovery phase.
Review

- Control options
- Recovery
Objective
Given information from discussion, handouts, and reading materials, describe the techniques used for victim rescue and recovery.

Overview
- Tactical considerations
- Search, rescue, and recovery
- Victim rescue methods
**Victim viability**
- Decide if the rescue attempt has a good chance of success

**Entry team tasks**
- Reconnaissance
- Map the scene
- Perform search and rescue
- Begin triaging victims or directing victims out of the contaminated environment

**Medical care**
Tactical Considerations

• Emergency decontamination
  - Performed in potentially life-threatening situations to rapidly remove the bulk of the contamination from an individual

Search, Rescue, and Recovery

• Limitations
  - Time consuming
  - Dangerous for the responder
  - Labor intensive
Search, Rescue, and Recovery

• Stages
  ➢ Primary search
  ➢ Secondary search

• Equipment
  ➢ PPE
  ➢ Portable radio
  ➢ Hand light
  ➢ Forcible-entry tool
  ➢ Thermal imaging devices
  ➢ Long rope(s)
  ➢ Tubular webbing or short rope

• Methods
  ➢ Direct the victim to a safe area
  ➢ Assist the victim to a safe area
  ➢ Carry the victim to a safe area
Search, Rescue, and Recovery

- Shelter-in-place
  - Considered when occupants are conscious
  - Found in a part of the building that is adequately protected from the hazard

Victim Rescue Methods

- Exit assist
  - Victim is responsive
  - Victim is able to walk
  - Responder guides victim to safety
  - Responder provides minimal level of physical support

Victim Rescue Methods

Two-person walking assist
Victim Rescue Methods

Two-person extremity carry

Victim Rescue Methods

Emergency drags

Victim Rescue Methods

Long backboard/SKED
Objective
Given information from discussion, handouts, and reading materials, describe the techniques used for victim rescue and recovery.

Review
• Tactical considerations
• Search, rescue, and recovery
• Victim rescue methods
Objective
Given information from discussion, handouts, and reading materials, describe the techniques used while preserving evidence found at the scene of a hazmat/WMD incident.

Overview
• Analyzing the incident
• Preserving evidence
• Taking action
Investigative authority
- Agency having legal jurisdiction to enforce a local, state, or federal law or regulation

Types of evidence
- Physical
- Trace (transfer)
- Demonstrative
- Direct
- Circumstantial

Preservation
- Preservation
Preserving Evidence

- Contamination

Preserving Evidence

- Chain of custody

Preserving Evidence

- Identifying witnesses
  - Provide invaluable information
Evidence sampling

Sampling team
- Sampler
- Assistant
- Documenter

Securing
Characterizing
Preserving
Taking Action

- Documenting
  - Personnel
  - Scene activity

Taking Action

- Notifying
  - Investigative authority
  - Hazardous devices personnel
Taking Action

• Identifying
  ➢ Samples and evidence to be collected

Taking Action

• Collecting samples
• Preventing secondary contamination

Taking Action

• Documenting samples
Taking Action

• Sampling and field screening protocols
  ➢ Testing to identify
    • Explosive devices
    • Radiological materials
    • Flammable materials
    • Toxic materials
    • Strong oxidizers
    • Corrosives

Taking Action

• Labeling
• Packaging
• Decontamination

Objective

Given information from discussion, handouts, and reading materials, describe the techniques used while preserving evidence found at the scene of a hazmat/WMD incident.
Review

• Analyzing the incident
• Preserving evidence
• Taking action
Given information from discussion, handouts, and reading, describe the techniques used in responding to illicit laboratories.

Objective

Overview

- Illicit laboratories
- WMD laboratories
- Tasks and operations
Illicit Laboratories

- Used to produce
  - Methamphetamine
  - LSD
  - Ecstasy
  - GHB
  - Chemical or biological agents
  - Explosives
  - Illegal fireworks

- Found in a variety of locations
  - Car trunk
  - Residential home
  - Commercial building
  - Basement
  - Attic
  - Extended-stay hotels
  - Boarded-up buildings
  - Storage units
  - Trucks or vans
**Illicit Laboratories**

- Characteristics of people
  - Keeping odd hours
  - Appearing nervous
  - Exhibiting high levels of anxiety
  - Exhibiting protective behavior
  - Possessing guard dogs/animals
  - Having surveillance cameras

**Illicit Laboratories**

- Drug laboratories
  - Clandestine drug laboratories
  - Grow operations

**WMD Laboratories**

- Ideological propaganda
- Terrorist group affiliation documentation
- Surveillance materials
- Nonweapon supplies
  - Uniforms
- Weapon supplies
  - Projectiles
- Other supplies
  - Booby traps

Indicators
**WMD Laboratories**

- Used to manufacture
  - Blister agents
  - Blood agents
  - Choking agents
  - Nerve agents

**Chemical laboratories**

**WMD Laboratories**

- Used to manufacture
  - Bacterial agents (anthrax)
  - Fungal agents (aflatoxin)
  - Viral agents (Ebola and smallpox)
  - Toxins (ricin and botulinum)

**Biological laboratories**

**Exposures**
WMD Laboratories

- Exposure results in
  - Nausea
  - Fever
  - Skin blisters
  - Rashes
  - Fatigue
  - Death

Tasks and Operations

- Notify authorities
- Determine response objectives
  - Secure and preserve the scene
  - Select PPE
  - Select detection devices
  - Set up/utilize decontamination corridor
  - Remediate
  - Report and document scene activities

Objective

Given information from discussion, handouts, and reading materials, describe the techniques used in responding to illicit laboratories.
Review

- Illicit laboratories
- WMD laboratories
- Tasks and operations