Chapter 3 — Awareness-Level Actions at Hazardous Materials Incidents
DISCUSSION QUESTION

What are the Awareness-Level personnel’s responsibilities at an incident involving hazardous materials?
Learning Objective 1

Discuss predetermined procedures and emergency response plans.
DISCUSSION QUESTION

What are predetermined procedures called in your jurisdiction?
Predetermined procedures give guidance on-scene.
Learning Objective 2

Describe notification requirements.
Notification requirements for contacting law enforcement should be in SOPs.

Courtesy of U.S. U.S. Army Corps of Engineers, photo by RobHaynes
What is the purpose of predetermined procedures and emergency response plans?
Learning Objective 3

Discuss the use of the *Emergency Response Guidebook (ERG).*
The *Emergency Response Guidebook (ERG)* has several uses.

- Aides in quickly identifying specific or generic habits
- Aides in protecting responders and general public
- Does not address all possible circumstances
- Designed for use at highway or railroad incidents
- Associated with open areas
- Limited value in fixed-facility locations or urban settings
The *ERG ID* Number Index is marked by yellow pages.

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1560</td>
<td>157</td>
<td>Arsenic chloride</td>
<td>1581</td>
<td>123</td>
<td>Methyl bromide and Chloropicrin mixture</td>
</tr>
<tr>
<td>1560</td>
<td>157</td>
<td>Arsenic trichloride</td>
<td>1582</td>
<td>119</td>
<td>Chloropicrin and Methyl chloride mixture</td>
</tr>
<tr>
<td>1561</td>
<td>151</td>
<td>Arsenic trioxide</td>
<td>1582</td>
<td>119</td>
<td>Methyl chloride and Chloropicrin mixture</td>
</tr>
<tr>
<td>1562</td>
<td>152</td>
<td>Arsenical dust</td>
<td>1583</td>
<td>154</td>
<td>Chloropicrin mixture, n.o.s.</td>
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<tr>
<td>1564</td>
<td>154</td>
<td>Barium compound, n.o.s.</td>
<td>1585</td>
<td>151</td>
<td>Copper acetoarsenite</td>
</tr>
<tr>
<td>1565</td>
<td>157</td>
<td>Barium cyanide</td>
<td>1586</td>
<td>151</td>
<td>Copper arsenite</td>
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<tr>
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<td>154</td>
<td>Beryllium compound, n.o.s.</td>
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<td>151</td>
<td>Copper cyanide</td>
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<td>1567</td>
<td>134</td>
<td>Beryllium powder</td>
<td>1588</td>
<td>157</td>
<td>Cyanides, inorganic, n.o.s.</td>
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<tr>
<td>1569</td>
<td>131</td>
<td>Bromoacetone</td>
<td>1588</td>
<td>157</td>
<td>Cyanides, inorganic, solid, n.o.s.</td>
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<tr>
<td>1570</td>
<td>152</td>
<td>Brucine</td>
<td>1589</td>
<td>125</td>
<td>CK</td>
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<tr>
<td>1571</td>
<td>113</td>
<td>Barium azide, wetted with not less than 50% water</td>
<td>1589</td>
<td>125</td>
<td>Cyanogen chloride, stabilized</td>
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<tr>
<td>1572</td>
<td>151</td>
<td>Cacodylic acid</td>
<td>1590</td>
<td>153</td>
<td>Dichloroanilines</td>
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<tr>
<td>1573</td>
<td>151</td>
<td>Calcium arsenate</td>
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<td>153</td>
<td>Dichloroanilines</td>
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<tr>
<td>1574</td>
<td>151</td>
<td>Calcium arsenate and Calcium arsenate</td>
<td>1590</td>
<td>153</td>
<td>Dichloroanilines</td>
</tr>
</tbody>
</table>

(Continued)
What does it mean if the material in the yellow or blue index is highlighted?

What is a TIH material?
The *ERG* Material Name Index is marked by blue pages.

<table>
<thead>
<tr>
<th>Name of Material</th>
<th>Guide No.</th>
<th>ID No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>153</td>
<td>2810</td>
</tr>
<tr>
<td>Hafnium powder, dry</td>
<td>135</td>
<td>2545</td>
</tr>
<tr>
<td>Hafnium powder, wetted with not less than 25% water</td>
<td>170</td>
<td>1326</td>
</tr>
<tr>
<td>Halogenated irritating liquid, n.o.s.</td>
<td>159</td>
<td>1610</td>
</tr>
<tr>
<td>Hay, wet, damp or contaminated with oil</td>
<td>133</td>
<td>1327</td>
</tr>
<tr>
<td>Hazardous waste, liquid, n.o.s.</td>
<td>171</td>
<td>3082</td>
</tr>
<tr>
<td>Hazardous waste, solid, n.o.s.</td>
<td>171</td>
<td>3077</td>
</tr>
<tr>
<td><strong>HD</strong></td>
<td><strong>153</strong></td>
<td><strong>2810</strong></td>
</tr>
<tr>
<td>Heating oil, light</td>
<td>128</td>
<td>1202</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Material</th>
<th>Guide No.</th>
<th>ID No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexafluoroacetone hydrate</td>
<td>151</td>
<td>2552</td>
</tr>
<tr>
<td>Hexafluoroacetone hydrate, liquid</td>
<td>151</td>
<td>2552</td>
</tr>
<tr>
<td>Hexafluoroacetone hydrate, solid</td>
<td>151</td>
<td>3436</td>
</tr>
<tr>
<td>Hexafluoroethane</td>
<td>126</td>
<td>2193</td>
</tr>
<tr>
<td>Hexafluoroethane, compressed</td>
<td>126</td>
<td>2193</td>
</tr>
<tr>
<td>Hexafluorophosphoric acid</td>
<td>154</td>
<td>1782</td>
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<tr>
<td>Hexafluoropropylene</td>
<td>126</td>
<td>1858</td>
</tr>
<tr>
<td>Hexafluoropropylene oxide</td>
<td>126</td>
<td>1956</td>
</tr>
<tr>
<td>Hexaldehyde</td>
<td>130</td>
<td>1207</td>
</tr>
<tr>
<td>Hexamethylenediamine, solid</td>
<td>153</td>
<td>2280</td>
</tr>
</tbody>
</table>
What is provided on the yellow-shaded pages of the *ERG*?

What is provided on the blue-shaded pages of the *ERG*?
ERG Initial Action Guides are marked by orange pages.
The left page has safety related information.

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### GUIDE 117

#### GASES - TOXIC - FLAMMABLE (EXTREME HAZARD)

**ERG2008**

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### POTENTIAL HAZARDS

**HEALTH**
- **TOXIC, Extremely Hazardous.**
  - May be fatal if inhaled or absorbed through skin.
  - Initial odor may be irritating or foul and may deaden your sense of smell.
  - Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
  - Fire will produce irritating, corrosive and/or toxic gases.
  - Runoff from fire control may cause pollution.

**FIRE OR EXPLOSION**
- These materials are extremely flammable.
- May form explosive mixtures with air.
- May be ignited by heat, sparks or flames.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Runoff may create fire or explosion hazard.
- Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

### PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first.** If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Keep out of low areas.
- Ventilate closed spaces before entering.

### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters’ protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

### EVACUATION

**Spill**
- See Table 1 - Initial Isolation and Protective Action Distances.

**Fire**
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

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(Continued)
The right page has response information.

(Continued)
The potential hazards section should be consulted first.

<table>
<thead>
<tr>
<th>GUIDE 117</th>
<th>ERG2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GASES - TOXIC - FLAMMABLE (EXTREME HAZARD)</strong></td>
<td></td>
</tr>
</tbody>
</table>

**POTENTIAL HAZARDS**

**HEALTH**
- TOXIC; Extremely Hazardous.
- May be fatal if inhaled or absorbed through skin.
- Initial odor may be irritating or foul and may deaden your sense of smell.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control may cause pollution.

(Continued)
The public safety section provides more detail.

**PUBLIC SAFETY**

- **CALL** Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Keep out of low areas.
- Ventilate closed spaces before entering.

(Continued)
Initial isolation distance is provided below public safety section.
How to determine the evacuation zone.

(Continued)
First responders must be properly trained to conduct the actions recommended by the ERG before attempting to perform them. They must also have the proper equipment to do so.
The emergency response section has three parts.

**Emergency Response**

**FIRE**
- Do not extinguish a leaking gas fire unless leak can be stopped.
- Small Fire
  - Dry chemical, CO₂, water spray or regular foam.
- Large Fire
  - Water spray, fog or regular foam.
  - Move containers from fire area if you can do it without risk.
  - Damaged cylinders should be handled only by specialists.
- Fire involving Tanks
  - Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
  - Cool containers with flooding quantities of water until well after fire is out.
  - Do not direct water at source of leak or safety devices; icing may occur.
  - Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
  - ALWAYS stay away from tanks engulfed in fire.

**SPILL OR LEAK**
- Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Fully encapsulating Vapor protective clothing should be worn for spills and leaks with no fire.
  - Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.
- Consider igniting spill or leak to eliminate toxic gas concerns.

**FIRST AID**
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory device.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of contact with liquefied gas, thaw frozen parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim warm and quiet.
- Keep victim under observation.
- Effects of contact or inhalation may be delayed.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

(Continued)
Awareness-Level personnel should not handle or touch contaminated or potentially contaminated victims!
The Table of Initial Isolation and Protective Action Distances is marked by green pages.

### TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

<table>
<thead>
<tr>
<th>ID No.</th>
<th>NAME OF MATERIAL</th>
<th>SMALL SPILLS (From a small package or small leak from a large package)</th>
<th>LARGE SPILLS (From a large package or from many small packages)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First ISOLATE in all Directions</td>
<td>Then PROTECT persons Downwind during:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meters (Feet)</td>
<td>DAY Kilometers (Miles)</td>
</tr>
<tr>
<td>2810</td>
<td>CS (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.2 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>DC (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.1 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>GA (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.2 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>GB (when used as a weapon)</td>
<td>60 m (200 ft)</td>
<td>0.4 km (0.3 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>GD (when used as a weapon)</td>
<td>60 m (200 ft)</td>
<td>0.4 km (0.3 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>GF (when used as a weapon)</td>
<td>60 m (200 ft)</td>
<td>0.2 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>H (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.1 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>HD (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.2 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>HL (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.1 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>HN-1 (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.1 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>HN-2 (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.1 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>HN-3 (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.2 km (0.1 mi)</td>
</tr>
<tr>
<td>2810</td>
<td>L (Lewisite) (when used as a weapon)</td>
<td>30 m (100 ft)</td>
<td>0.2 km (0.1 mi)</td>
</tr>
</tbody>
</table>

(Continued)
DISCUSSION QUESTION

What is the difference between a small spill and a large spill?
How to calculate Protective Action Distances.

![Diagram showing Protective Action Zone, Wind direction, Initial Isolation Zone, Liquid Spill, Downwind Distance, and 1/2 Downwind Distance.](image)
REVIEW QUESTION

What is provided on the orange-shaded pages of the ERG?

What is provided on the green-shaded pages of the ERG?
Emergency Response Centers are found in the white pages.

In a Hazardous Materials Emergency:
Isolate the area and contact CHEMTREC® immediately with as much of the following information as possible.

IDENTIFY:
- Your name/organization
- Location you are calling from
- Call-back number

INCIDENT:
- Location of incident
- Time of incident
- Weather/environment
- Product(s) involved
- Quantity
- Container type
- Any injuries/deaths
- Assistance on site/en route/requested

OTHER INFO:
- UN, NA, or STCC Code
- Origin of shipment and shipper
- Carrier
- Destination/consignee
- Truck/car/trailer/flight #
- Bill of lading #

CHEMTREC® • 800-424-9300
Before calling gather specific information.

- Caller’s name, callback telephone number, and FAX number
- Location and nature of problem
- Name and ID number of material
- Shipper/consignee/point of origin
- Carrier name, railcar reporting marks, or truck number

(Continued)
Before calling gather specific information.

- Container type and size
- Material quantity transported/released
- Local conditions
- Injuries, exposures, current conditions involving spills, leaks, fires, explosions, and vapor clouds, etc.
- Local emergency services that have been notified
REVIEW QUESTION

What types of information should be provided to an emergency response center?
Learning Objective 4

Obtain information about a hazardous material using the ERG.

This objective is measured in Skill Sheet 3-1.
Describe isolation and discuss denial of entry.
The concept of isolation works to secure the emergency scene.

(Continued)

Courtesy of U.S. Air Force
The isolation perimeter establishes a boundary.
What is an isolation perimeter?
Discuss terrorist incidents.
Terrorist incidents require unique actions.

Courtesy of August Vernon
Awareness and Operations duties at terrorist incidents.

Protect selves and others through isolation perimeter

Avoid contacting contaminates or contaminated surfaces

Document observations, with pictures if possible

Make note of other witnesses and observes at the scene

Protect evidence at the crime scene as best able
Summary

• Responsibilities of Awareness-Level personnel
  – Understand predetermined procedures
  – Be able to use ERG and sections
  – Be familiar with safety procedures
  – Be aware of responsibilities at terrorist or criminal activities