

Hazardous Materials Awareness: Self-Study Guide

Sandoval County Fire Department

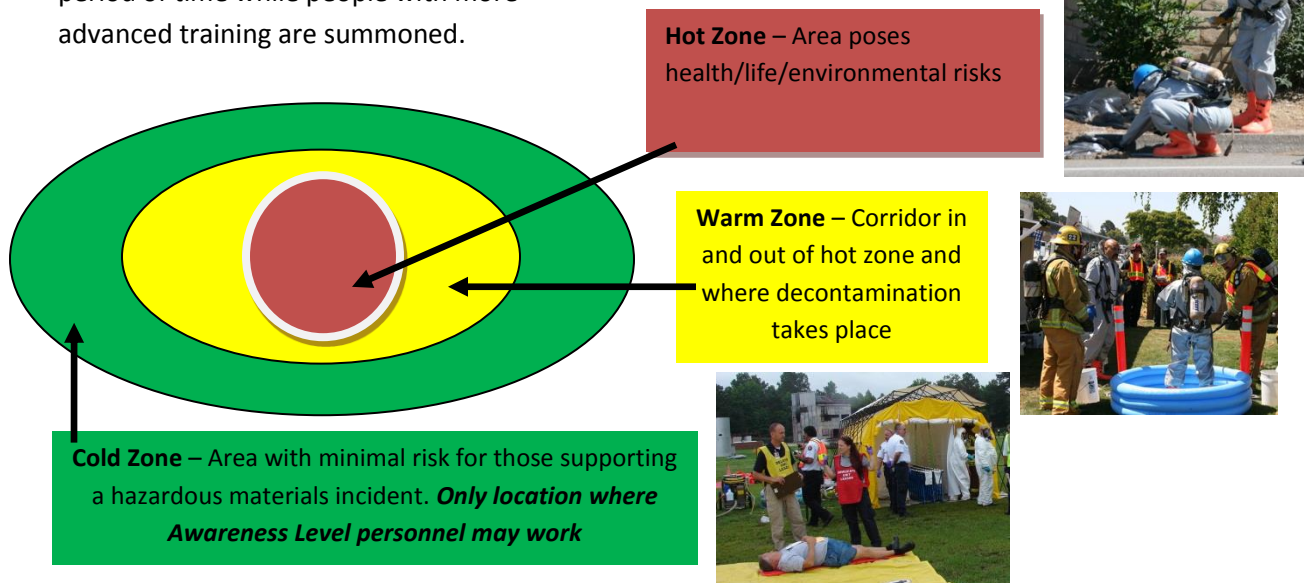
Complete before taking classroom portion of class (Use DOT Emergency Response Guidebook "Orange Book")

SECTION 1 - Introduction

Hazardous materials are any substances that pose a threat to human health, property, and/or the environment. A **hazardous materials emergency** involves a substance that is outside of or likely to leave its container and present a threat to human health, property, and/or the environment. You are being trained to the **Hazardous Materials Awareness Level**. This will allow you identify a problem, protect yourself, notify others who need to respond, and isolate an incident. At this level you do the most, by doing just a few things well. Trained at the Awareness Level **you are not** to take direct action to try and stop a leak, clean up a spilled substance, or otherwise involve your-self directly with a hazardous material.

SECTION 2 – Zones on a Hazardous Materials Emergency Scene

A hazardous materials scene is divided into three major concentric circles. The center circle is where there is a life and/or health risk caused by the hazardous material and is known as the **hot zone**. Extending outside the major risk area is a work space that is closed to the public as well as emergency responders who do not have advanced hazardous materials training. This second circle, known as the **warm zone** is where trained hazardous materials staff move in and out of the hot zone and are decontaminated. The final and most distant circle from the life and health threat is the **cold zone** where communications, command, logistics, and other support functions take place on a hazardous materials incident. Emergency responders trained at the Awareness level may only work in the cold zone, even if that means letting victims go unattended for an extended period of time while people with more advanced training are summoned.



SECTION 3 Work Within Your Training

Fools rush in. In a hazardous materials incident, as on any emergency scene, it is critical that people only do that which they are trained and currently certified to do, have the proper personal protective equipment (PPE) for doing such a task, and are in the proper physical condition to safely complete the task. Working within those very specific restrictions and as a part of an established incident command system is what is required of all emergency response personnel on a hazardous materials incident. Such a scene requires deliberate planning and thought. Everyone must be fully accounted for, tracked, and only doing tasks they have been assigned to do within the incident command system. To do otherwise is not only prohibited by response protocols and standard operating procedures but is extremely dangerous and can lead to emergency responder injury and death. **Do only what you are trained to do.** You do not want to complicate or make a hazardous materials incident worse.

“Is the scene safe?” is a standard question you should ask upon approaching all emergency scenes. Part of determining scene safety is establishing if a scene is potentially a hazardous materials incident. This is done from a distance as you approach. Responders are often taught the somewhat arbitrary but still helpful guideline, “The rule of thumb.” That guideline is a reminder to assess a scene at such a distance as is created by extending your arm and holding up your thumb. For a scene involving an unknown material scene assessment should be done from at least 100 yards away. Fire, rail cars, pipelines, and large containers require greater distances. People are taught that the entire incident should hide behind your thumb when you hold your arm outward and thumb up. From that distance, often using binoculars, a responder can be relatively safe and still ascertain if there are vehicles or structures with hazardous materials labels or signs, indications of multiple patients, environmental damage such as liquid spilled, dead birds or other animals, vapor clouds, or other indications of a potential hazardous materials incident.



SECTION 4 What You Can Do Trained at the Awareness Level

If you have any reason to suspect that you are dealing with a hazardous materials incident you need to **first protect yourself**. This may include backing up and removing yourself even further from the incident as where you first discovered it. Initial isolation distances for an unidentified substance should be at least 100 meters. That means you should be able to fit either a soccer or football field between yourself and the incident. If the event involves fire, a rail car, or a tanker truck then that initial distance should increase to 800 meters (a half a mile) in all directions.

Once you have removed yourself from immediate danger you should do the following: **isolate** the incident and deny entry to others, **summon** additional resources, and attempt to **identify** the material involved while still maintaining appropriate isolation distances. The order of which of these tasks will be done first, second, and third will depend upon the individual circumstances of the incident. Ultimately,

your decision making should be driven by what task will, do the most good for the most number of people. Again, any steps you take are done after you have accounted for your own safety.

The ability to isolate a scene is generally enhanced by being in uniform and with an emergency response vehicle, but even an off-duty responder in their private vehicle still has the potential to safely isolate an incident they happen upon. However, law enforcement is best suited for such a task and should be summoned as soon as possible. It is always better to deny entry to too large of an area than too small of one. Your key task is to reduce human injury and death by isolating the scene.

SECTION 5 Who is in Charge of a Hazardous Materials Incident

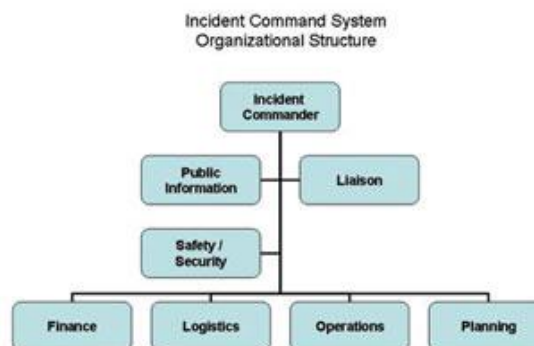
In New Mexico, **all hazardous materials incidents are under the authority of the New Mexico State Police**. The particular type of State Police Officer responsible for hazardous materials incidents is an **Emergency Response Officer (ERO)**. When contacting dispatch advise, “Notify State Police and contact an ERO about this situation.” Based on local protocols the dispatch center will likely know which resources to deploy to a hazardous materials scene such as the local fire department or even a hazardous materials team.



Not all State Police Officers are EROs. Be specific in requesting that a State Police ERO is notified if you are working with a hazardous materials incident. Once notified, a State Police ERO may or may not respond directly to a scene. If the material is of a small amount and the situation is able to be handled by local resources such as the area fire department, the State Police ERO may choose to monitor the situation remotely and communicate via phone or radio with personnel on site.

However, if the scene is complicated, exceeds the abilities of local emergency responders, and/or meets other criteria, the State Police ERO may respond directly to the scene. The State Police EROs serve as the Incident Commander or are part of a Unified Command. Their job is not to “plug the leak” or “mop up the mess.” Rather their job is to coordinate the scene and bring the necessary resources, such as a hazardous materials clean up contractor, to the scene.

Until such time as a State Police ERO arrives at the scene, local agencies will follow their protocols and accepted standards and **use the Incident Command System** and have an Incident Commander in place. This is true even if the local responders are all only trained at the Awareness level. Incident Command depends upon the first arriving unit assuming command, sizing up the scene, summoning additional needed resources, and protecting responders and citizens from harm.



SECTION 6 Sizing Up and Relaying Scene Information

When reporting a potential or known hazardous materials incident state clearly the words, "This is a (potential) hazardous materials emergency." This information should be given directly to the local emergency response dispatch center. Trained at the Hazardous Material Awareness Level you should be prepared to report the following information to either or both an ERO or dispatch center:

Hazardous Materials Incident Notification Information Checklist
The following information should be given to dispatch. Dispatch should be instructed to give all information received to response agencies.

Notification	Time Dispatch Notified _____
Caller	Caller name _____ Caller location _____ Caller phone number _____
Hazardous Material Information	Incident Location _____ (address or nearest milepost or exit) Time Incident Occurred _____ Container type _____ (truck, train car, drum, storage tank, pipeline, etc.) Substance _____ UN Identification Number _____ Other Identification _____ (704 marking, labels, etc.) Amount of material spilled / released _____ Current condition of material _____ (flowing, on fire, vapors present, etc.)
Scene Description	Weather conditions _____ (i.e., sunny, overcast, wet, dry, etc.) Wind direction _____ Wind speed _____ Terrain _____ (i.e., valley, stream bed, depression, asphalt, etc.) Environmental concerns _____ (stream, sewers, etc.)
Affected Population	Number of people affected _____ Condition of people affected _____ (actual or anticipated)
Resources	Resources required _____ (EMS, HazMat Team, Fire Department, etc.)
Response	Response actions anticipated and/or in progress _____ (i.e., rescue, fire suppression, containment, etc.)
Comments	_____ _____ _____

The New Mexico Hazardous Material Emergency Response Plan divides hazardous materials incidents into three broad levels. These levels are based on the scope of the situation.

New Mexico Hazardous Materials Emergency Response Plan

Appendix A to the HMER Plan – Levels of Response

Hazardous Materials Incident
Levels & Response Criteria

		1		2		3	
INCIDENT LEVEL	LEVEL	LEVEL		LEVEL		LEVEL	
RESPONSE	LOCAL RESPONDERS & AGENCIES	LOCAL AND MUTUAL SUPPORT AND/OR <u>ANY</u> STATE INVOLVEMENT					
DEFINITION	Spill, leak or fire which can be contained, controlled, extinguished using equipment available to operations level first responders	An incident which requires the use of any kind of specialized protective equipment, special tools or knowledge beyond the normal scope of a first responder					
RESPONDER LEVEL OF TRAINING	Incident can be properly handled by response agency personnel trained to first responder operations level	Incident requires skills/knowledge which is normally found at the HazMat Response Team (technician level) and/or requires specialized knowledge of a particular substance or container					
PRODUCT	Small quantities of petroleum products (fuel, oil), or materials which can be approached by personnel wearing SCBA and/or SFPC	Structural Firefighter's Protective Clothing (SFPC) with a Self-Contained Breathing Apparatus (SCBA) DOES NOT provide adequate protection (<i>refer to ERG and other HazMat response guidebooks</i>) i.e., chlorine (gas), anhydrous ammonia, sulfuric acid					
LIFE SAFETY	Minimal hazard	Evacuation of limited area required		Evacuation of large area required			
ENVIRONMENTAL	None to minimal	moderate		severe			
CONTAINER INTEGRITY (product in container)	Minimal to no damage	Damaged but serviceable for handling or transfer of product		Catastrophic rupture possible			
LEAK SEVERITY	None or small leak contained with available resources	Requires special resources and/or reportable quantity exists under SARA Title III		May not be controllable even with special resources			
SPILL SIZE *	small	Small to medium		Medium to large			
DECONTAMINATION REQUIREMENTS	None to basic decontamination utilizing resources available to the first responders	Basic to full decontamination requiring multiple stages					

* **small** – contents of: drum, small cylinder, package or bag

* **medium** – contents of: multiple drums, multiple packages or bags

* **large** – contents of: tank truck/car, storage tank, multiple medium-sized containers

Level 1 incidents consist of those incidents which can be handled by local responders trained to the first responder operations level and do not necessarily require a New Mexico State Police Emergency Response Officer (ERO) on scene.

Level 2 and 3 incidents require an ERO on scene and may require response actions above and beyond the first responder operations level.

SECTION 7 About the Department of Transportation Emergency Guidebook (DOT-ERG)

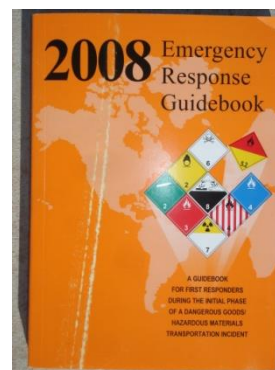
As an initial responder to a hazardous materials incident you can greatly help the success of the scene by assessing what is going on and reporting that information to other arriving units. The standard handbook that will help you determine what materials you might be responding to as well as providing you with instructions for what to do for the first 30 minutes of a hazardous materials scene is the **Department of Transportation (DOT) Emergency Response Guidebook (ERG)**. The DOT ERG often known as the “Orange Book,” is also available as an application for iPhone/iPod and Droid.

One of the key things you must do as someone trained at Hazardous Materials at the Awareness level is know how to use the DOT ERG. That means that before you arrive at your first hazardous materials incident you must have practiced using the guide, have **read the book’s directions** in its “**white pages**,” practiced looking up four digit DOT hazardous materials identification codes in the “**yellow pages**,” looking up hazardous materials by name in the “**blue pages**,” and knowing how to use the “**orange pages**” response guidelines as well as when to use the Isolation Distances on the Table in the “**green pages**.”

As the name suggests, the DOT ERG applies to materials that are being shipped using transportation systems. This includes hazardous materials being carried by **rail, truck, plane, ship**, and even **pipe line**. When these products are being shipped they are often in a vehicle that has a diamond shaped sign on its sides. The diamond signs known as **DOT placards** help to label and identify what is being transported. Not every hazardous material load has to have a placard on the vehicle. This applies to smaller loads, often less than a 1,001 pounds,

SECTION 8 Using the DOT Emergency Response Guidebook

For the DOT ERG to work you need to know how to use it. You should now take time to read all of the “white pages” in the front of the DOT ERG. As you read make notes below in the blank spaces demonstrating that you know how to use the guide:



Practice Using the DOT ERG by looking up the following information.

1. You look up a four digit UN number in the _____ color pages
2. You look up the name of the chemical in the _____ color pages
3. You look up a diamond placard with a key word and/or symbol on pages numbered _____
4. What are shipping papers: _____

5. Who has the shipping papers on a train _____
6. Who has the shipping papers on a Plane _____
7. Who has the shipping papers on a Truck _____
8. What can the container shape tell you

9. What does it mean when a name and/or UN number entry is highlighted in green

10. What do you use the "orange page" section to do:

11. You are told that there is truck with a diamond placard on it. The diamond placard has the four digit number "1203." What is the product? _____
12. Which guide number do you use for 1203? _____
13. What is the fire/explosion hazard for 1203? _____

14. You see a truck with this diamond placard on it. What is the product? _____

15. Which guide number do you use? _____
16. What do the test tubes mean at the top of the placard?

17. What are the health hazards of this product?



18. When you do not know what a product is what response guide should you use? _____
19. What is CHEMTREC?(look in white pages or back cover) _____
20. Using the glossary what does n.o.s. mean? _____

Section 9 The NFPA 704 Diamond

Whereas DOT Placards are used for identifying materials that are being transported, the National Fire Protection Association (NFPA) 704 Diamond is used on fixed facilities such as buildings and chemical storage containers.

The NFPA Diamond is not a national requirement like the DOT placards. It is adopted by some but not all local cities and other communities. Some businesses might also choose to place them on their buildings and other facilities even if they are not required to do so.

When more than one type of hazardous material is present at a location the NFPA diamond describes the overall hazard of the entire facility not the particulars of one hazardous material. Just because a NFPA diamond is not observed at a building or facility does not mean that there is not a hazardous material at that location.

The NFPA Diamond consists of four smaller diamonds. Three of the small diamonds each have a number from 0 to 4 rating a relative level of hazard on a standard scale. A “zero” is low hazard and a “four” is high hazard. Within the NFPA Diamond the blue diamond describes the health hazard, the red diamond describes the fire hazard, and the yellow diamond describes the reactivity hazard. A fourth, white diamond describes a specific hazard such as a material being radioactive or corrosive.



SECTION 10 Material Safety Data Sheet (MSDS)

Another common source of information about hazardous materials is found on Material Safety Data Sheets (MSDS). MSDS provide more detailed information about specific hazardous materials than either a DOT Placard or NFPA 704 Diamond. Generally speaking a MSDS consists of several pages of information that is specific to a product. These forms are found in work and public spaces. They should be displayed and available to workers as well as emergency responders in a “right to know” location at the job site where those chemicals are found. This could consist of something as small as a three ring binder or as large as one or more file cabinets.

ANSWERS TO STUDY QUESTIONS – Using the DOT ERG

1. You look up a four digit UN number in the Yellow color pages
2. You look up the name of the chemical in the Blue color pages
3. You look up a diamond placard with a key word and/or symbol on pages numbered 16-17
4. What are shipping papers: Vital, detailed information about the product that is being transported
5. Who has the shipping papers on a train train crew member
6. Who has the shipping papers on a Plane pilot
7. Who has the shipping papers on a Truck they are in the cab
8. What can the container shape tell you What type of product is being transported
9. What does it mean when a name and/or UN number entry is highlighted in green Use the green pages and table 1 to determine initial isolation distances
10. What do you use the “orange page” section to do: Provide a response guide for what to do for the first part of an incident and describes major hazards
11. You are told that there is truck with a diamond placard on it. The diamond placard has the four digit number “1203.” What is the product? gasohol, gasoline, motor spirit, petrol
12. Which guide number do you use for 1203? 128
13. What is the fire/explosion hazard for 1203? highly flammable
14. You see a truck with this diamond placard on it. What is the product? Hydrochloric acid
15. Which guide number do you use? 157
16. What do the test tubes mean at the top of the placard? It is corrosive
17. What are the health hazards of this product? Toxic and may cause burns injury or death
18. When you do not know what a product is what response guide should you use? 111
19. What is CHEMTREC?(look in white pages or back cover) Emergency response phone number
20. Using the glossary what does n.o.s. mean? not otherwise specified