MWC

MIDWEST CONSORTIUM
FOR HAZARDOUS WASTE
WORKER TRAINING

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Industrial First-on-the-Scene

Participant Guide

Acknowledgments

The Midwest Consortium developed this course under cooperative agreement number U45 ES06184 from the National Institute of Environmental Health Sciences.

We encourage you to comment on these materials. Please give your suggestions to those leading the program in which you are now enrolled or click on the Contact page of the Midwest Consortium website: https://mwc.umn.edu/contact/.

Warning

The material was prepared for use by experienced instructors in the training of persons who may be first on the scene of an emergency. Authors of this material have prepared it for the training of this category of workers as of the date specified on the title page. Users are cautioned that the subject is constantly evolving. Therefore, the material may require additions, deletions, or modifications to incorporate the effects of that evolution occurring after the date of this material preparation.

Disclaimer

This training is intended to meet the requirements of the OSHA Hazardous Waste Standard (29 CFR 1910.120) for first responder personnel (awareness level) who may be the first-on-the-scene at a hazardous materials incident. The training program covers basic hazard recognition, identification, reporting, and self-protection for individuals who may do preliminary observation of an event. It does **not** provide the necessary hazard recognition and protective skills required to perform emergency response activities. To undertake the activities of emergency responders, additional training is necessary.

For further information about this matter, consult the training instructor and/or your company's safety/emergency response plan or the Local Emergency Planning Committee for your city or county.

Content was updated August 3, 2023 and all web links are active as of that date; if you find an error, please inform the facilitator so that it can be updated.

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Introduction

You are here because you may be the first person on the scene at an incident involving hazardous materials. The term *hazardous material* will be defined during the program. Those who may be first on the scene include production workers, supervisors, maintenance workers, plant guards, or managers. As the first on the scene, your job is to observe and report conditions to appropriate personnel. The personnel trained in dealing with the incident will then take control of the event.

Course Objectives

When complete, you will better be able to:

- Identify hazardous materials and the risks they present
- Recognize potential outcomes related to hazardous materials during an emergency
- Understand the responsibilities as the first-on-the-scene
- Recognize the need for additional resources and to notify the appropriate personnel

We want you to participate in the program. Please ask questions about anything that you do not understand and/or anything you would like to have discussed in more detail.

Rights and Responsibilities

As the person first-on-the-scene, you must observe and report relevant information to the appropriate person. You have specific responsibilities that you must carry out to the best of your abilities. Along with these responsibilities, you should know about laws and regulations that provide worker rights.

Objectives

When complete, you will be better able to:

- Identify worker rights as defined by law
- Identify the first-on-the-scene role in the Incident Command System

"SARA" Is Your Friend

The Occupational Safety and Health Administration (OSHA) is the governmental agency that enforces workplace health and safety regulations. In the Superfund Amendments and Reauthorization Act (SARA), Congress directed OSHA to develop requirements for training emergency responders.

OSHA's training requirements cover a wide range of emergency responders, from those first-on-the-scene to specialists. For those individuals who are likely to discover an incident during the course of their job, "awareness" training is required. This training was designed specifically to fulfill OSHA requirements for those who are first-on-the-scene.

OSHA requires that awareness-level training include:

1. An understanding of what hazardous materials are and the risks associated with them in an incident.
2. An understanding of the potential outcomes associated with an emergency created when hazardous materials are present.
3. The ability to recognize the presence of hazardous substances in an emergency.
4. The ability to identify the hazardous materials, if possible.
5. An understanding of the role of the first-on-the-scene awareness individual in the employer's emergency response plan. This includes site security, site control, and the use of the U.S. Department of Transportation Emergency Response Guidebook.
6. The ability to recognize the need for additional resources and to make notification to the appropriate personnel.

Additional training is required to control or contain a spill, aid in clean-up, rescue victims, or perform other on-site duties. If you are interested in other types of training programs, let your facilitator know.

What Rights Does SARA Give You as a Worker?

Under the regulation issued by OSHA, your employer must provide a medical exam if you are injured or overexposed while performing emergency responder's (including first-on-the-scene) duties at a scene on his/her behalf. If you work for any private employer and are part of an organized emergency response activity, you are covered by OSHA. In all cases, a written emergency response plan is required. This plan must be available to you and your elected representatives, and you must be trained in your assigned role.

What Rights Does SARA Give You as a Citizen?

Under another part of SARA, known as SARA Title III, emergency response plans for communities must be developed. This is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA). In order for communities and states to develop comprehensive plans, state and local committees have been established. The Local Emergency Planning Committee (LEPC) generates the Local Emergency Response Plan (LERP); similarly, the State Commission writes a State Emergency Response Plan (SERP). Under Title III, officials at facilities with hazardous substances must develop a site-specific Emergency Response Plan (ERP), cooperate with the state

and local committees, report releases, and make hazardous material information available to appropriate state and local officials, including the LEPC and the Fire Department.

The Incident Command System (ICS)

Although every hazardous materials incident is unique, the need to respond in an organized and rational way calls for structure. The first-on-the-scene emergency responder is an important part of the structured response. Your response to the incident is the first step.

OSHA regulation 1910.120 requires that an Incident Command System be in place to deal with a hazardous materials response. The Incident Command System specifies the duties assigned to individuals as well as determines the chain of command for the emergency response. Regulation 1910.120 requires that individuals who are assigned specific duties as part of the Incident Command System must be trained in how to carry out these duties. An example organizational chart for the Incident Command System is shown on the next page.

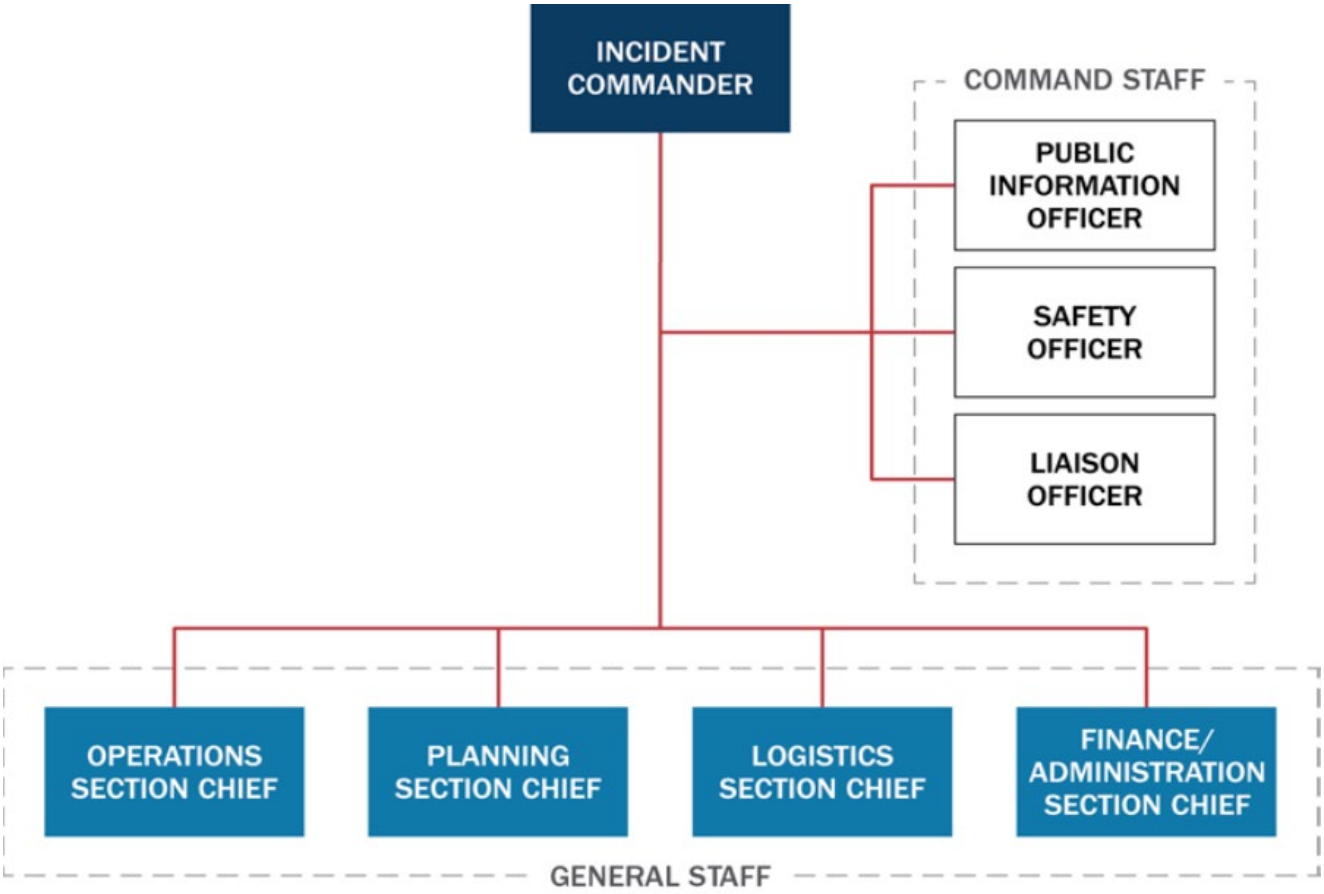
If as part of your job you may be first-on-the-scene, your employer should specify to whom you should make your initial report and what your duties are in your employer's Emergency Response Plan (ERP). After reporting the incident, you should then take the place in the chain of command to which you have been assigned.

If you discover an incident that has taken place away from your job, contact the local emergency response number 911.

- It is important that the correct person be notified and informed of the incident as quickly as possible.

- You should know to whom to report and to take orders from after the emergency response team has arrived on the scene.

ICS Response Team Structure



Source: https://www.fema.gov/media-library-data/1508151197225-ced8c60378c3936adb92c1a3ee6f6564/FINAL_NIMS_2017.pdf

Note: This chart should be adapted for the location, specific event and the available personnel. Other personnel may be added.

Liaison Officer, Safety Officer, and Public Information Officer provide services for the entire organization.

Operations, Planning, Logistics, and Finance/Administration are assigned functional authority.

Why Use Incident Command?

- The Incident Command System (ICS) provides a standardized, on-scene, all-hazard incident management framework
- ICS allows its users to expand or contract organizational structure to match incident demands
- ICS is not hindered by organizational or jurisdictional boundaries and constraints
- ICS helps insure:
    - Safety of emergency responders, bystanders and the community
    - Achievement of tactical objectives
    - Efficient use of response and recovery resources

Incident Commander: Responsibilities

- Establishes a single Incident Command Post (ICP) for the incident
- Establishes consolidated incident objectives, priorities, and strategic guidance and updating them every operational period
- Selects a single section chief for each position on the General Staff needed based on current incident priorities
- Establishes a single system for ordering resources
- Approves a consolidated Incident Action Plan (IAP) for each operational period
- Establishes procedures for joint decision making and documentation
- Captures lessons learned and best practices

As the first-on-the-Scene, you may participate in the response, if properly trained and directed by the Incident Commander. Your first and primary responsibility is to report incident facts accurately and as completely as possible to the appropriate party.

Key Points

- This training program was designed to meet OSHA requirements for first- on-the-scene awareness-level training
- Regulations give you certain rights. Know what they are!!
- Federal regulations require an Emergency Response Plan (ERP) at all plants where a hazardous materials emergency response may occur
- The Incident Command System:
  - Sets the chain of command
  - Assigns specific job duties to specific individuals
  - Is developed **before** an incident takes place

Review Questions

1. What do regulations developed because of SARA do for you as a worker?

_____

_____

_____

_____

2. What does SARA do for you as a citizen?

_____

_____

_____

_____

3. Why is an Incident Command System needed? What does it do?

_____

_____

_____

_____

Emergency Scenarios

This section will give you an opportunity to think about some emergencies which have occurred and could happen again. The definition of a hazardous material (legal and practical) will also be discussed.

Objectives

When completed, you will be better able to:

- Recognize a hazardous situation
- Describe the need for gathering information before actions are taken

Exercise

- You will work in small groups for this activity.
- One person in your group should take notes.
- Your facilitator will tell you which scenarios you are to discuss. Spend three to five minutes on each, answering all the questions.
- Note: Please stay within the facts given. Don't make up anything.

Scenario A

It's 2:05 p.m. on a hot Friday in July. You are working at your plant and discover that something is leaking from old transformers stored in a designated area at the facility. You call the plant's hazardous materials personnel and wait nearby for them to arrive.

Answer the following in your group:

1. What should you tell the first responders?

_____

_____

_____

_____

_____

2. What "clues" were given that something serious may be happening?

_____

_____

_____

_____

_____

3. What hazards do you think exist with this situation?

_____

_____

_____

_____

_____

Scenario B

While walking across the plant's truck yard, a loading dock worker comes upon an unattended vacuum truck.

The vacuum truck is leaking liquid from its bottom valve. The driver is not in sight. It is a warm, clear day with a brisk breeze blowing. Traffic in the truck yard is very light, but soon another driver arrives and pulls alongside the leaking vacuum truck.

Answer the following in your group:

1. What actions should the loading dock worker perform?

_____

_____

_____

_____

_____

_____

2. What information should the loading dock worker share with plant first responders?

_____

_____

_____

_____

_____

_____

Scenario C

At 3:00 P.M. on a Wednesday afternoon, you observe two mechanics arriving to work on some underground pipes. The first mechanic removes a sewer lid and leans over the open hole to try to see the conditions at the bottom. Suddenly, he seems to pass out, and he falls into the hole.

Answer the following in your group:

1. What should you do?

_____

_____

_____

_____

_____

_____

2. What could happen if the other mechanic tries to rescue the coworker?

_____

_____

_____

_____

_____

_____

Scenario D

You are driving a forklift when you accidentally run into an unmarked pipe. The pipe is pierced and begins to spray liquid. There is a shutoff valve a few inches below the damaged spot in the pipe.

Answer the following in your group:

1. What should you do?

_____

_____

_____

_____

_____

_____

2. What information is needed by responders?

_____

_____

_____

_____

_____

_____

Examples from Your Experiences

Have you ever been the first person to discover an emergency situation?

[ ] YES [ ] NO

What kind of emergency did you discover?

_____

_____

_____

_____

Were hazardous materials involved?

[ ] YES [ ] NO

How did you know?

_____

_____

_____

_____

What is a hazardous material?

_____

_____

_____

_____

What is a Hazardous Material?

Hazardous material is a legal term. The definitions of hazardous material can be found in several environmental laws. According to these laws, a material may be defined as hazardous because it is included on a list of substances considered to be hazardous materials.

A hazardous material can be defined as any substance capable of producing unwanted effects on health, safety, or the environment. Sometimes non-hazardous materials will be considered hazardous when mixed with other materials. Community members who notice something unusual will generally not know the name of chemicals. For those individuals, the following definition of a hazardous material can be used:

You should consider any unknown material as a hazardous material.

It is difficult to detect some hazardous materials. If you do not know for sure what a material is, treat it as a hazardous material!

If you do not know <u>for sure</u> what a material is and that it is not dangerous, treat it as a hazardous material!

Key Points

- Every situation is different
- Additional information is almost always needed before you can act safely
- Incorrect actions can cause serious damage to your health (and the health of others!) as well as to property
- All unknown materials should be considered hazardous until proven otherwise

Review Question

Think about the incidents from your personal experience. Why would they (or wouldn't they) be considered hazardous materials incidents?

_____

_____

_____

_____

_____

Hazard Recognition

This section describes some clues you should look for both to help you avoid hazards and to prepare the emergency responders for hazards they may face at the scene you've discovered.

Note that OSHA's General Duty Clause requires employers to provide ""employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees...".

Objectives

When completed, you will be better able to:

- Identify physical, biological, and chemical hazards
- Describe important characteristics of the scene
- Recognize how to safely observe a potential hazard
- Recognize labels and placards

Introduction

In order to recognize hazards and know "what's going on," two kinds of information are needed. The first kind of information concerns the type of health and safety hazards that are present at the scene. The second type of information concerns elements of the scene other than the health and safety hazards.

Health and safety hazards can be grouped into three main types:

1. Physical
2. Biological
3. Chemical

Examples of each type or hazard are listed below.

1. Physical

   - Ionizing radiation
   - Electricity
   - Stress
   - Heat and cold
   - Slips, trips, and falls
   - Falling or flying objects
   - Steam and chemical vapor clouds
   - Confined spaces
   - Noise

2. Biological

   Infectious wastes may be found in restroom facilities, where biohazard containers are used by employees. Other biohazards at industrial sites include animal/bird wastes on structures, poisonous snakes/spiders or poisonous plants such as poison ivy. All employees must know who to call in a medical emergency.

   Any other company-specific biohazards will be covered by your facilitator.

3. Chemical

   - Flammable liquids
   - Reactive materials
   - Oxidizing agents
   - Corrosives
   - Poisons (including carcinogens, or cancer-causing materials)

This section will provide you with some “clues” to help you recognize some physical, biological, and chemical hazards. Besides identifying potential hazards at the scene you observe, there is other information that would be helpful to note.

Characteristics of the scene include such information as:

- Weather conditions
- Other chemicals or hazards that may be present
- Nearby buildings and/or businesses
- Access and evacuation routes
- Exact location
- Type of release? airborne, water, on roadway or land
- Evidence of smoke or fire
- Dead animals or vegetation
- People in the area or nearby
- Terrain

Characteristics of the scene can make the incident and the hazards present become even more dangerous. Any information about the characteristics of the scene must be relayed to the emergency responders.

What’s Going On = Hazards + Characteristics of the Scene

Physical Hazards - Keep a Safe Distance

It is important to recognize the physical hazards at the scene not only to protect yourself, but also to include them as information you give to emergency responders.

Radiation (29 CFR 1910.1096)

Radioactive sources are used in industry and medicine, and radioactive wastes result from energy and weapons production. The best indication that a radiation source is present is the label shown on the right. It is usually **magenta** or **purple-colored** on a **yellow** background. Workers should keep as far away as possible from any containers with this marking unless they have had specific training and know that they are adequately protected. Where radiation hazards exist, the company must include Standard Operating Procedures (SOPs) in the safety and health plan.

Radiation Symbol

As the first-on-the-Scene, you should keep as far away as possible from any containers with the radiation marking.

Radiation exposure is minimized by **time, distance, and shielding** between you and the source. This means that the less time you spend near the source, the farther away from the source you stay, and the more shields (cars, walls, etc.) between you and the source the safer you will be. All forms of radiation should be considered very hazardous - **treat them with respect!**

Electricity

Power lines may be damaged in transportation accidents or incidents in which fire is involved. Downed lines represent a major risk of electrocution. Other risks of electrical and hazardous material exposure may be present at transformers and circuit boxes. **The presence of water will increase the hazard**. **Maintain a safe distance and keep others out of the area.**

Stress

As the first-on-the-scene, you have to make a lot of decisions quickly. This can lead to a lot of stress for that person. The wrong decision may increase the hazards at the incident. Remember, your job is to gather as much information as you can as quickly as you can and call the local emergency response personnel for help. **You are not trained to do everything. Just do what you are trained to do.**

Heat and Cold

Extreme temperatures put extra physical stress on the body. You will probably not be at the scene long enough to suffer these effects, but the response team may be at risk. If the temperature is extremely high or low, you should include this information in the report to the emergency responders

In addition, whatever conditions exist at the scene should be included in your report. For example, if the ground in the area of the incident is extremely slippery, you should make that fact known.

Slips, Trips, and Falls

Injured backs and broken limbs may result from slips, trips, or falls. Avoid any unstable footing. Don't climb steep slopes. Don't climb over equipment. Don't put yourself in situations which could result in injury. **If you fall and cannot alert the response team, response to the incident will be delayed,** and you may be exposed to hazardous materials while waiting for someone else to discover the accident.

Falling or Flying Objects

If the scene is very unstable (for example, shifting drums or explosions), go to a safe location. If you are seriously injured or pinned under a falling object, you cannot make a report to those who can control the incident. **Your job is to notice the changing conditions, not be a part of them.**

Steam or Chemical Vapor Clouds

Steam from ruptured lines can cause severe burns. **Maintain a safe distance**. The steam, or the heat from it, may also react with other materials to compound the problem at a hazardous materials incident scene. Steam will be carried by the wind. Stay upwind to further reduce the possibility of contact with the steam. **If there is steam at the scene, that information should be included in your report**.

It is possible that what appears to be steam may not actually be steam. Some chemicals may give off toxic clouds which may appear steam-like. Also, gases escaping from a pressurized container may look like steam. Those gases might be flammable.

Do not approach anything that looks like steam or a cloud.

Confined Spaces (29 CFR 1910.146)

Confined spaces are areas like ditches, stream beds, trailers, tanks, railcars, basements, sewers and storage closets. They are large enough that a person can enter but have restricted means for entry/exit and are not designed for continuous occupancy.

Some confined spaces are defined as a "permit-required confined space" meaning they have one or more of the following characteristics: contains or has the potential to contain a hazardous atmosphere; contains material that has the potential to engulf an entrant; has walls that converge inward or floors that slope downward and taper into a smaller area which could trap or asphyxiate an entrant; or contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat stress.

Entry into confined spaces poses many dangers which first-on-the-scene responders must keep in mind. In fact, over half of all confined space fatalities involve would-be rescuers. Entry into confined spaces may block your view of what is happening around you. In addition, accumulations of chemical vapors can happen quickly in confined spaces and could prove deadly to you either through direct exposure or the increased risk of explosion. Don’t attempt to rescue people from confined spaces unless you have special confined-space rescue equipment and have been trained.

PHYSICAL HAZARDS CHECKLIST

What do I look for?

- ☐ Radiation sources and symbols
- ☐ Damaged utility poles or other sources of electricity
- ☐ Weather conditions
- ☐ Unsafe and changing conditions
- ☐ Steam or clouds
- ☐ Confined spaces

How do I observe them?

- ☐ From a distance
- ☐ Upwind if possible
- ☐ From higher elevation if possible
- ☐ With binoculars if possible

Biological Hazards

This section is optional depending on the needs of the class.

Chemical Hazards

The chemical hazards you face will depend on the properties of the material at the scene. Below are some definitions of properties that chemicals may have.

A **flammable** material gives off enough vapor to burn if there is a source of ignition.

A **reactive** material has the tendency to react with another component (including water).

An **oxidizing** material supports or speeds up burning by providing a source of oxygen.

A **corrosive** material is a liquid or solid that eats away or dissolves a material when it touches it.

A **poisonous** material can cause injury, illness, or death through exposure.

There can be a number of clues present at any incident that may provide information about the possible dangers from chemical hazards at the incident. This section describes some of the clues that you should look for to determine if chemical hazards are present. Clues to look for include location, labels and placards, characteristics of the containers that are present, and things you notice about the area around the incident (such as dead animals or vegetation).

Remember: Even if you do not see any clues, hazards may be still present.

Recognizing Chemical Hazards

There are five kinds of information that will help you organize observations about potential hazards as the first-on-the-scene. These are:

1. Occupancy (use of the space) and Location (where)
2. DOT Placards and Labels
3. Markings and Other Label Systems
4. Shipping Papers and Safety Data Sheets (SDSs)
5. Senses

Each of these topics provides information useful to the responders as they assess the hazards and develop a response plan and these topics are covered in this section.

1. Occupancy and Location

Identify the purpose or activity conducted in the area of the incident. If the location is the wastewater treatment plant, you may know the process and be able to describe the materials used in the plant to responders; if you do not know about the process, it is sufficient to identify the wastewater treatment plant. Plant or community responders will be able to identify any hazardous materials that may be in the location. Location can provide information on whether a hazard may be present. Certain areas of your facility may be known to contain hazardous materials. Releases or leaks in these areas (such as production vessels, laboratories, tank farms, reactors, etc.) should always be suspected of involving hazardous materials.

Location also requires a description of the area. This includes any:

- Drain
- Process or electrical equipment
- Water way
- Roadway/highway
- Buildings with occupants
- Buildings where materials are stored
- Weather conditions that affect the scene (wind, temperature, precipitation)
- Smoke, flames
- Steam or vapor clouds

2. DOT Placards and Labels

The DOT system of placards and labels is required on hazardous materials during shipment. It is important to understand the systems which are used to identify hazardous materials. Hazard information is included on DOT placards fixed to large containers (trailers, rail cars, tanks) and manufacturer labels fixed to small containers (drums, packages, boxes).

Caution must be exercised, because labels and placards may be missing, incorrect, or difficult to read.

Below is an example of a DOT signage or label that might be seen on a truck, train or cardboard shipping box.

Notice the… Shape: diamond

Color: red

Symbol: a flame

4-digit number: 1075

1-digit number: 2

All DOT placards are the same shape, but differ in the other 'clues' that are shown.

The red color of this placard indicates that the contents are flammable. A full listing of the hazard for each color is shown below:

Color	**Hazard**
Orange	Explosive
Red	Flammable or combustible gas or liquid
Green	Non-flammable gas
Yellow	Reactive
White with skull & crossbones	Toxic
White and red vertical stripes	Flammable solid
White top with black bottom	Corrosive
White top with red bottom	Spontaneously combustible
Blue	Water-reactive
Yellow top with white bottom	Radioactive
Black and white stripes on top, white bottom	Low to moderate hazard

NOTE: physical (radioactive) and chemical hazards are included.

The flame symbol of this placard also indicates that the chemical is flammable. Other symbols are shown in the table below:

Symbol	Hazard
Bursting ball	Explosive
Flame	Flammable/combustible/dangerous when wet/organic peroxide
Skull and crossbones	Poisonous
Circle and flame	Oxidizing material
Gas cylinder	Non-flammable gas
Propeller/Trefoil	Radioactive
Test tube/hand/metal	Corrosive
Special symbol	Infectious

The 4-digit number is an identification number used in the DOT Emergency Response Guidebook (ERG). This number will provide responders with information on potential hazards, public safety and emergency response procedures. Sometimes placards with the 4-digit number in the center are referred to as a "number placard."

The 1-digit number provides information on the type of hazard that might result from release. For example, 2 indicates that the contents is a gas. The meaning of each of the nine hazard classes is shown below:

#	UN Hazard Class
1	**Explosives**
2	**Gases (compressed, liquefied, or dissolved under pressure)**
3	**Flammable liquids**
4	**Flammable solids or substances**
5	**Oxidizing substances**
6	**Poisonous and infectious substances**
7	**Radioactive substances**
8	**Corrosives**
9	**Miscellaneous dangerous substances**

For a report, the shape will guide a responder to the DOT ERG. Assuming you cannot read the numbers, a report of the color and symbol would provide a responder with information that the material is flammable. If you report color, symbol, 4-digit and 1-digit numbers, a responder would know that the contents are a flammable gas (color, flame, 2), the 4-digit number would be used to identify the chemical as acetone in the ERG.

Look at the placard to the right, and identify the shape, color, symbol, 4-digit number and 1-digit number for a report!

Some placards do not have a 4-digit number. One example is shown here:

For this placard, the report would include shape, color, symbol and 1-digit number and the word 'radioactive'. Examples of other words used include:

- Flammable Gas
- Combustible
- Fuel Oil
- Non-Flammable Gas
- Flammable Solid
- Oxidizer
- Infectious Substance
- Corrosive
- Organic Peroxide
- UNXXXX
- Dangerous when wet
- Spontaneously Combustible

Using the DOT Emergency Response Guide (ERG)

You can find more information on what these placard numbers and symbols mean in the DOT Chart and the *DOT Emergency Response Guide*. The ERG is divided into sections, each with its own color. The typical starting point is looking up a substance by name (blue pages), ID (UN) number (yellow pages) or image (placard, rail car, trailer).

YELLOW: The yellow pages list chemicals in numerical order based on their assigned ID number (UN number). If you are reading a placard or label which has a four-digit number in the center, you can look up the chemical name in the yellow pages, which will tell you the name of the chemical and the Guide number. When using the app, you simply type the number into the Search by Name or UN field.

BLUE: The blue pages list chemicals alphabetically by their name. From this listing you can determine each chemical's ID number and the Guide number. When using the app, you simply enter the chemical name into the Search by Name or UN field.

ORANGE: The orange pages are called the Guides. These pages are of use in determining the potential hazards of the chemical in question, with the greatest concern listed first. Additionally, the Guides give a brief description of the emergency action that should be taken by appropriate emergency response personnel. When using the book, you must first find the appropriate Guide Number by looking in the yellow or blue pages or referring to the Table of Placards. When using the app, you are immediately taken to the appropriate Guide Number when you select the chemical name, ID number, or placard (Note: with some chemicals you may receive guidance based on if a fire is involved before proceeding to the Guides).

GREEN: Some chemicals are also included in the green pages. The green pages indicate the Table of Initial Isolation and Protective Action Distances. This section of the ERG describes the distances necessary for initial isolation around a chemical incident as well as the distance downwind that persons must be protected.

- Book: Chemicals that are highlighted green in the blue and yellow pages will be found in Table 1 (green pages). If the name of the material in Table 1 is followed by “(when spilled in water)”, consult Table 2 for toxic gases produced. If there is an asterisk next to the ID number in Table 1, also consult Table 3.
- Smartphone: If a chemical has green page, this will be indicated during your search and, in the orange pages, you will see at the top of the screen the words Initial Isolation and Protective Distances. You can access the green pages by swiping left.
- iPad: The green pages information will automatically appear on the right side of the screen.
- Windows: The green pages information will automatically appear at the bottom of the Guide.

3. Markings and Other Label Systems

In addition to DOT placards other information may be required on shipping containers. As appropriate, these markings include:

- Package orientation arrows
- Inhalation Hazard
- Poison
- Keep away from Heat
- HOT
- RQ (reportable quantity)

As the first-on-the-scene, make careful note of any marking on a container; the first responders will find all of the information useful.

Other Label Systems

The Hazard Communication Standard (HCS 2012) is described below, followed by two labeling systems that may continue to be used - the NFPA system and the HMIS system.

Hazard Communication Standard 2012 – Globally Harmonized System (GHS)

HCS 2012 covers labelling of hazardous chemicals used in industry (excluding wastes) to describe physical hazards (such as flammability and corrosivity), health hazards (including both immediate and long-term health effects) and environmental hazards. These labels include pictograms that may be visible from a distance.

The eight health and safety pictograms and one (non-mandatory) environmental pictogram are shown on the following pages.

Note the… Shape: red diamond

Symbol: black on white background.

The words above each pictogram are descriptions of the symbol; the words below the pictogram are the HCS 2102 Hazard Classes covered by the symbol. NOTE: Only the red diamond and symbol are shown on a label. In addition to the pictogram, a label will show other information such a signal word (Danger or Warning), hazard and precautionary statements, the product identifier, and supplier identification, but these require that you be closer to the container to read.

Do not move closer to a container in order to read the label.

HCS Pictograms and Hazards

Health Hazard

- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

Flame

- Flammables
- Pyrophorics
- Self-Heating
- Emits Flammable Gas
- Self-Reactives
- Organic Peroxides

Gas Cylinder

- Gases Under Pressure

Corrosion

- Skin Corrosion/Burns
- Eye Damage
- Corrosive to Metals

Flame Over Circle

- Oxidizers

Environment (Non-Mandatory)

- Aquatic Toxicity

Exclamation Mark

- Irritant (skin and eye)
- Skin Sensitizer
- Acute Toxicity (harmful)
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone Layer (Non-Mandatory

Exploding Bomb

- Explosives
- Self-Reactives
- Organic Peroxides

Skull and Crossbones

- Acute Toxicity (fatal or toxic)

Employers may continue to use signage such as National Fire Protection Association (NFPA) diamonds or HMIS (Hazardous Material Information System) requirements for workplace labels, as long as they are consistent with the requirements of the HCS.

National Fire Protection Association (NFPA) - 704 System

The NFPA system is used for storage vessels and stationary containers at an industrial facility.

Below is an example of the NFPA 704 System.

Notice the …

Shape: diamond

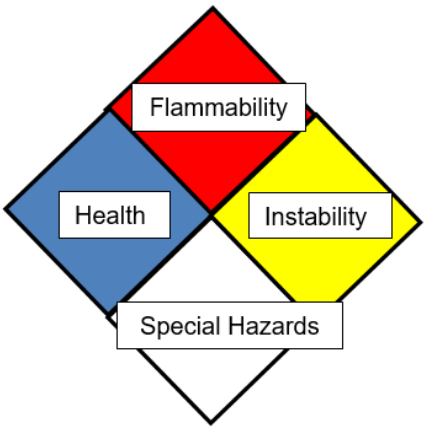
Colors: Red, Blue, Yellow, White

Numbers: 4, 2, 3

Symbol: W

All NFPA placards and labels are the same shape and have the same colors. What differs are the numbers and symbol.

The color of each of the four small diamonds indicates the type of hazard as shown below.



Color	Hazard
Red	Flammability
Blue	Health
Yellow	Instability
White	Special hazards

The number in the red, blue, and yellow diamonds is a relative rank of the potential flammability, health, and instability hazard, respectively, ranging from 0 or blank (low) to 4 (high hazard).

The Special Hazards (white) section of the NFPA-704 label may contain symbols (examples shown below) that give more information about the chemical. The following are symbols and their meanings that might be found in the Special Hazards (white) section of the NFPA-704 label.

NFPA Standard Symbols:

W	OX	SA
Reacts with water	Oxidizer	Simple Asphyxiant

Non-Standard Symbols:

- **COR:** Corrosives.
- **ACID** and **ALK** (Alkali) to be more specific.
- **BIO:** Biological Hazard.
- **POI:** Poisonous Material (e.g. strychnine)
- **CYL or CRYO:** Cryogenic Material (e.g. liquid nitrogen)
- **Radioactive trefoil:** Radioactive materials. (e.g. plutonium, uranium)
- The field may also be left blank if no special hazards are present.

The Hazardous Materials Information System (HMIS)

These labels are used on storage vessels and containers.

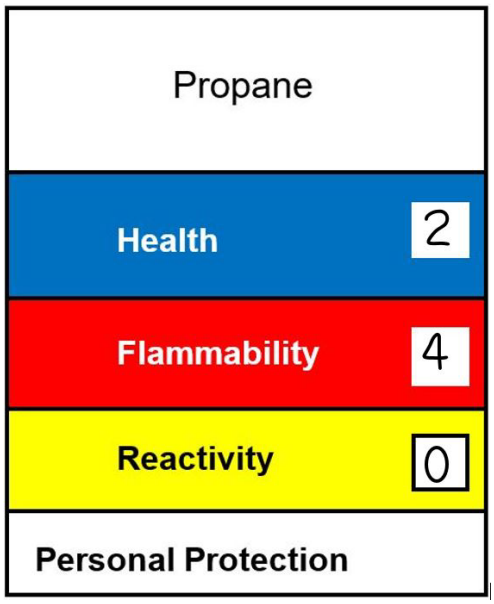
Notice the ….

Shape: Rectangular

Chemical Name: Propane

Colors: Blue, Red, Yellow, White

Boxes: Contain numbers or letters



All HMIS labels have the same shape and colors. For hazard recognition and reporting, it is important to note numbers in the blue, red and oranges boxes and any letter in the white section.

The numbers rank the potential health, flammability, and physical hazard and range from 0 (low) to 4 (high).

The Personal Protection section may contain a letter which tells you what personal protective equipment you should use to protect yourself when working with the material. Capital letters range from A (safety glasses) to K (full protective suit with gloves, boots, a hood or mask, and an air-line or Self-Contained Breathing Apparatus). If personal protection is coded X, specialized handling procedures are needed. Lower-case letters n through u, w, y and z are codes for specific protective equipment. For example, q represents boots and u represents an organic vapor respirator. A chart outlining each letter code will be accessible to responders.

LABELS AND PLACARDS CHECKLIST

What do I observe?

- ☐ Type of placard (word or number)
- ☐ Shape
- ☐ Color
- ☐ Words
- ☐ Numbers
- ☐ Symbols/labels/pictograms

How do I observe them?

- ☐ From elevation if possible
- ☐ From a distance
- ☐ Upwind if possible
- ☐ With binoculars, if possible

Placards and Labels Exercise

You will again work in your small group. Several placards and labels will be distributed by your facilitator. Answer the following questions and be ready to report back as a group.

Answer the following in your group:

1. What important features of the labels and placards should you note?

_____

_____

_____

_____

_____

2. What are the hazards displayed on each of the placards and labels given to your group?

_____

_____

_____

_____

_____

4. Shipping Papers and Safety Data Sheets (SDSs)

Shipping papers and SDSs contain important information about the hazards of chemicals.

Shipping Papers

Each shipment of hazardous materials must have paperwork documenting the specific contents of the shipment and relevant information. This paperwork has different names, depending on the type of transportation vehicle.

Transportation	**Where Is It Kept**	**What's It Called**
Truck	In the cab	Bill of Lading, Hazardous Waste
Train	With the conductor	Waybills, Consists, Wheel Reports
Barge/Ship	In the wheelhouse, on the barge	Dangerous Cargo Manifests
Airplane	In the cockpit	Shipper's Certification, Shipping paper, Airbill, Bill of lading

When a shipment arrives at a plant, a copy of the shipping papers is given to plant personnel. As part of site characterization, shipping papers may be found for materials ultimately transferred to the site.

Do not risk exposure to a potentially hazardous material by retrieving shipping papers from the transport vehicle.

Information Included in Shipping Papers

Shipping papers are required by the Department of Transportation (DOT). The shipper of the material provides this information. No standard format is required and they may vary in appearance; however, the following points must be covered.

- Shipper's name and address
- Receiver's name and address
- Description of hazardous material
- DOT hazard classification information
- Quantity of material shipped to the location

Specialized training on SDSs, labels and placards, shipping papers, or other sources of information may be required, depending on plant operations.

Safety Data Sheets

Chemical properties, hazards and exposure controls for materials used at the facility are described in a Safety Data Sheet (SDS, formerly known as the Material Safety Data Sheet, or MSDS). SDSs are required by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

To make this safety information more useful, the SDS consists of 16 required sections as shown in the OSHA Quick Card: Hazard Communication Safety Data Sheets, on the next page. Regardless of supplier or manufacturer, the order of the information must be as listed.

Preplanning must include a review of SDSs. This review will provide information about the properties of each material used on-site and how responders should react to each during an emergency.

SDSs and other resources provide important information during preplanning activities.

OSHA QUICK CARD™

Hazard Communication Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products.

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.
Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.
Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.
Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.
Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.
Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.
Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).
Section 9, Physical and chemical properties lists the chemical's characteristics.
Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.
Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
Section 12, Ecological information*
Section 13, Disposal considerations*
Section 14, Transport information*
Section 15, Regulatory information*
Section 16, Other information, includes the date of preparation or last revision.
*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15(29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.
See Appendix D of 1910.1200 for a detailed description of SDS contents.
For more information: www.osha.gov

OSHA (800) 321-OSHA (6742) U.S. Department of Labor

Workers must be trained in reading SDS information and how to work safely with materials that are routinely used. At a manufacturing plant, the SDSs must be available to employees during all shifts.

What information does the SDS provide to emergency responders?

Preventive measures

- Precautions for safe material handling and use
- Storage instructions
- Protective clothing and equipment needed

Emergency preplanning

- Fire and explosion hazards
- Spill or leak procedures
- Special protection information
- Health hazards
- First aid information

The supplier/manufacturer should be contacted for additional information as soon as a substance arrives at a work site. The SDS will include information about how to contact the supplier for information.

Limitations of SDSs and Shipping Papers

Although SDSs and shipping papers contain important information, there are a number of limitations to their use during an emergency. Some of these limitations are listed below.

- Limited information
    - The information may be incomplete or inaccurate
    - Space on the form may be inadequate
    - The information may not be relevant for the facility
- Insufficient time to read the information
- Insufficient time to call the manufacturer's/supplier's contact person
- Not immediately available

    - Shipping papers may be damaged or not easily removed from where they are kept
    - SDS may not be located right at the spill or release site

5. Senses

Your eyes and ears are important to gathering information when you are the first-on-the-scene of a release or other potential hazardous material incident.

Use your eyes to gather information to describe:

- Occupancy and Location
    - Activities conducted in area of incident
    - Location of incident
- Wind, temperature, precipitation
- Environmental clues
    - Dead or injured animals
    - Affected grass, trees
    - Smoke or flames
    - Steam or visible vapor release
- DOT Placards and Labels (and other label systems)
    - Markings and Colors
    - Container Shapes and Sizes
    - Shipping Papers and SDSs

Use your ears to gather information to describe:

- Communication heard from those involved, including injured
- Changes in pressure or pressure releases (hissing)
- Instability (contact sound as loads shift)

Be aware of any new sensation on your skin:

- Burn, tingle

Do not rely on your nose.

Many hazards (e.g., carbon monoxide, radiation) have no warning properties by smell.

Some hazards overwhelm the sense of smell and the odor is no longer detected by your nose - but it has not gone away (e.g., hydrogen sulfide or sewer gas).

Key Points

Health and safety hazards can be grouped into three main types: physical, biological, and chemical.

Physical hazards include:

- Ionizing Radiation
- Electricity
- Stress
- Heat and cold
- Slips, trips, and falls
- Falling or flying objects
- Steam and chemical vapor clouds
- Confined spaces
- Noise

Biological hazards may be:

- Infectious wastes found in restroom facilities
- Animal/bird wastes on structures
- Poisonous snakes/spiders or plants (such as poison ivy)

Examples of properties of chemicals that may pose a hazard include:

- Flammable
- Reactive
- Oxidizer
- Corrosive
- Poisonous

As a first-on-the-scene responder you should collect information that will be used by the response team. Do this:

- From a distance
- Upwind if possible
- From elevation if possible
- With binoculars if possible

Hazard information can be gathered using:

1. Occupancy and Location
2. DOT Placards and Labels
3. Markings and other label systems
4. Shipping Papers and Safety Data Sheets (SDSs)
5. Senses

The occupancy and location where the emergency occurs can be a clue to the presence of hazardous materials.

DOT placards and labels and markings and colors provide information on the content of containers and hazard.

Shipping papers document important information about the contents of the shipment. A safety data sheet (SDS) contains information on health effects, physical and chemical properties, fire and explosion hazard, precautions for safe handling, and control measures.

Review Questions

1. List 4 physical hazards and situations in which each might occur.

2. List 4 clues to various types of chemical hazards which may be visible from afar.

3. An NFPA label has a "0" in the flammability diamond. Is it flammable?

4. What should be observed from labels/placards?

5. What should be observed about the container?

6. What should be observed about the scene?

6. Are there poisonous animals or plants in/around your facility?

7. How should you make observations at the scene?

Health Effects

In this section you will learn about health effects that may occur to people like yourself who may be first-on-the-scene at a hazardous materials incident. Recognizing the potential for a health effect is the first step in avoiding it.

Objectives

When completed, you will be better able to:

- Recognize how an emergency situation may be hazardous to your health
- Recognize the signs and symptoms related to chemical exposures
- Identify when and where hazardous materials affect the body
- Identify what to do if you think you have been exposed

HEALTH EFFECTS EXERCISE

Answer the following questions by circling the correct answers. You will discuss the correct answers after you have covered the material in this section.

1. A one-time exposure to a chemical is safe.

   True False

2. Your nose will usually provide you with adequate warning about toxic chemicals.

   True False

3. The best way to avoid breathing toxic chemicals is to maintain your distance.

   True False

4. Your skin will block absorption of all toxic chemicals.

   True False

5. Coughing may indicate that the gases are harmful.

   True False

6. All doctors are trained to recognize diseases caused by chemicals.

   True False

7. Nausea and vomiting after responding to an accident may be caused by breathing toxic substances.

   True False

8. Watery eyes are one way the body tells you that a chemical may be toxic.

   True False

How, When, and Where?

How Do Chemicals Enter Your Body?

Chemicals can enter your body through skin contact, ingestion, inhalation, or injection.

Skin Contact: If you come into physical contact with some types of chemicals, they may just irritate your skin, and/or they may be absorbed into your body through the skin. Chemicals can enter through broken or damaged skin, such as cuts or other skin abrasions.

Ingestion: Chemicals may enter your body through swallowing chemicals on your hands if you smoke or eat after being exposed.

Inhalation: Chemicals can enter your body through breathing of fumes given off by the chemicals. Some chemicals can also mix with steam that you might inhale. Liquid droplets and dusts may also be inhaled.

Injection: Chemicals can enter your body through other means. If you receive any type of puncture wound at the scene, it is possible that whatever caused the puncture wound could be contaminated.

When Will Effects Appear?

Effects of chemicals may be considered acute and/or chronic.

Acute: Develops quickly, usually after exposure to high concentrations of a hazardous substance.

Example: Contact with concentrated nitric acid can cause an acid burn on skin.

Chronic: Takes a long time to develop or requires long exposures, usually at low concentrations.

Example: Breathing asbestos fibers can result in lung diseases many years following exposure.

Where Will Effects Appear?

Reactions to chemical exposure may be local or systemic.

Local: Develops where the substance enters the body or comes into direct contact with parts of the body.

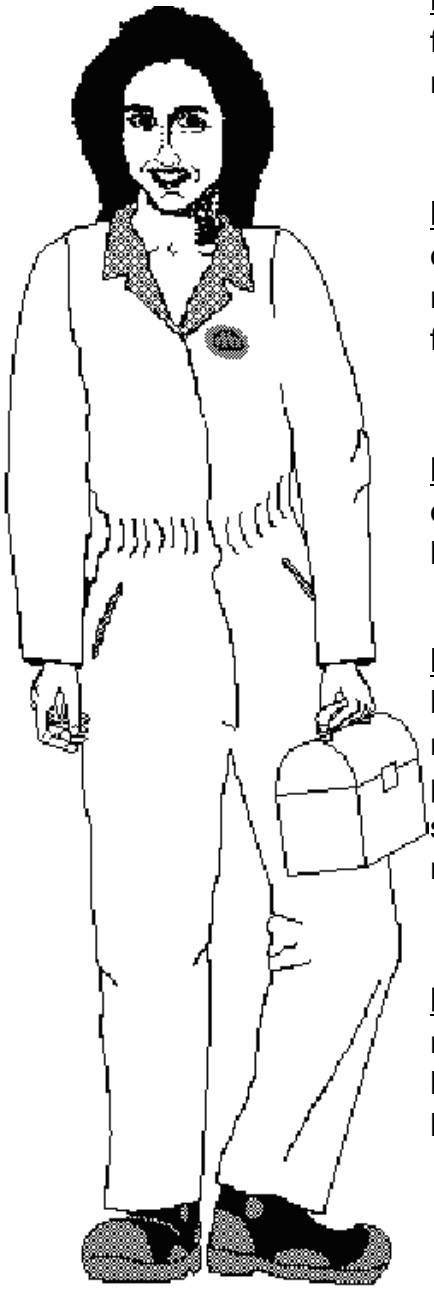
Example:Breathing hydrochloric acid can immediately result in coughing and cause bronchitis.

Systemic: Develops at some place other than the point of contact.

Example: Benzene can be absorbed through the skin and cause anemia and other blood disorders.

The figures on the next two pages summarize what part of your body may be affected and how your body may react to exposure. Are you exposed to any of the materials/stresses shown on these two pages?

Where does the health effect occur?



Head: solvents, heat exhaustion, eye strain, noise, gases, vapor

Ears: excessive noise

Teeth & Gums: acid fumes, cellulose, acetate production, lead poisoning

Chest & Lungs: cotton dust, TDI, detergent enzymes, beryllium solvents, long-term exposure to mineral dust (e.g., asbestos), metal oxides from welding, gases vapors

Stomach & Intestines: vapors, fumes, ingested substances

Bones & Joints: excessive vibration, constant dampness

Eyes: smoke, grease, fumes, acids, ultraviolet radiation

Nose & Throat: ammonia, caustic soda, dusts, resins, solvents, acid fumes, smoke

Muscles & Back: excessive or improper lifting, bending, vibration

Reproductive System: lead, pesticides, radiation, polystyrene production, xylene, some solvents, benzene, lead, mercury, anesthetic gas

Nervous System: noise, metal poisoning (e.g., lead, mercury), sexual harassment, shift work

How Does Your Body React?

<u>Head:</u> dizziness, headache

<u>Teeth & Gums:</u> corrosion of tooth enamel, blue gums

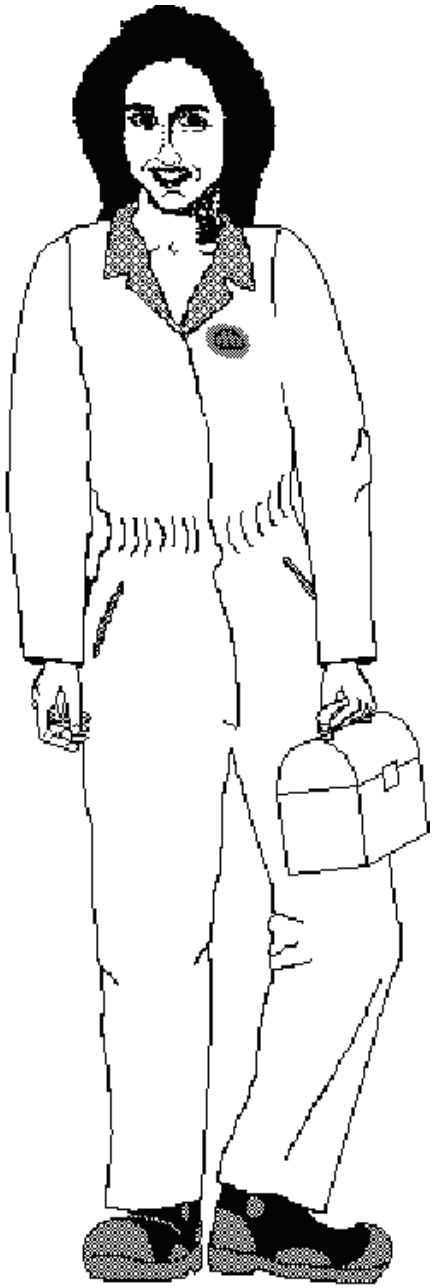
<u>Chest & Lungs:</u> wheezing, congestion, shortness of breath on mild exercise, flu-like symptoms (e.g., metal fume fever")

<u>Stomach & Intestines:</u>

Vomiting, diarrhea

<u>Bones & Joints:</u> arthritis.

<u>Skin:</u> redness, dryness, itching, ulcers, skin cancer



<u>Eyes:</u> redness, irritation, watering, grainy feeling, "welder's flash"

<u>Ears:</u> ringing, temporary deafness, hearing loss

<u>Nose & Throat:</u> sneezing, coughing, sore throat, nasal cancer

<u>Muscles & Back:</u> soreness, strain

<u>Reproductive System:</u> miscarriage, irregularities in menstruation, damage to fetus or chromosomes, sterilization

<u>Nervous System:</u> stress, nervousness, irritability, sleeplessness, tremors, speech changes

At the Scene

Your body may be able to help you pick up clues that will help describe the scene to the emergency responders. While many substances leave no clues that can be detected by your senses, you should include anything that your senses pick up in your report. **Do not move closer to the scene to see if you can "sense" something.**

Clues Your Senses Can Provide

Eyes	Can spot hazards, read signs and placards, and/or display symptoms that can be caused by hazardous materials
Skin	Can tingle
Ears	Can hear sounds such as hissing
Nose	Can smell bad or unusual odors

WARNING - Your nose will not be able to detect many substances

Even substances that have a smell may be missed if you become "used to" the odor. Many substances have no smell.

Never breathe hazardous materials on purpose

Before You Leave the Scene

Maintain a safe distance from the scene, stay upwind and uphill, and use binoculars in order to avoid possible contamination by chemicals at the scene.

In the event that you are having an effect from something at the scene or any unknown substance at the scene comes into contact with your skin or clothing, leave immediately and request information about possible contamination from either your call-in person or emergency responders. Reiterate what has happened to the incident commander or health and safety officer when s/he arrives to verify whether or not there is a possibility of contamination. They will advise you of the necessity to seek medical attention. If your skin or clothing becomes contamination, make note of your movements and try not to contact other surfaces, because whatever you contact may also become contaminated.

After You Have Left the Scene

You should be aware of any symptoms that you may be having. If you are having any symptoms after being first-on-the-Scene, you should:

- **Notify the agency** (Call 9-1-1, fire department, State EPA or equivalent, or other agency) in charge of responding to the incident. In most cases, you cannot delay this notification. Call immediately. Others who were at the scene may be experiencing similar symptoms.
- **Get information** about the chemicals involved in the incident. This may include easily identified (placards, labels and signs) information, as well as retrieving the Safety Data Sheets (SDSs) that are kept at the location where the material may be used, warehoused or temporarily stored. If you are not able to retrieve the SDSs, then communicate with your Emergency Coordinator or the plant guard.
- **See a doctor.** You may need to see an occupational physician who is trained to recognize signs and symptoms of chemical exposures. Your family doctor may not have the training or experience to do this.
- **Keep a log or diary** of any symptoms you experience. Record specific dates and times of the incident and of any symptoms you are having.

HEALTH EFFECTS EXERCISE AGAIN

Below are the same questions that you answered at the beginning of this section. Answer the questions again to see if any of your answers have changed. Your instructor will discuss the correct answers after everyone has finished.

1. A one-time exposure to a chemical is safe.

True False

2. Your nose will usually provide you with adequate warning about toxic chemicals.
True False

3. The best way to avoid breathing toxic chemicals is to maintain your distance.
True False

4. Your skin will block absorption of all toxic chemicals.

True False

2. Coughing may indicate that the gases are harmful.

True False

3. All doctors are trained to recognize diseases caused by chemicals.

True False

4. Nausea and vomiting after responding to an accident may be caused by breathing toxic substances.

True False

5. Watery eyes are one way the body tells you that a chemical may be toxic.

True False

Key Points

- Chemicals can enter your body through skin contact or puncture, ingestion, or inhalation
- Health effects may show up immediately or may not show up until years after exposure
- Exposures affect different parts of the body
- Your senses may help you spot clues, but they are not a reliable way to evaluate whether a hazard exists
- If you have any symptoms or know you have come into contact with an unknown substance, leave immediately and make a call-in
- If you have any symptoms after an emergency, see an occupational physician or emergency department physician right away

Sizing-up the Scene

These exercises will give you an opportunity to pull together all the information that was covered in the previous sections of this program.

Objectives

When complete, you will better be able to:

- Recognize how different situations affect a hazardous materials incident response
- Identify what kind of information is needed for responders
- Describe how to pull together information to size up a scene

Emergency Scenarios - Exercise

Your facilitator will guide a discussion about the Emergency Scenarios Exercise you completed earlier in the course.

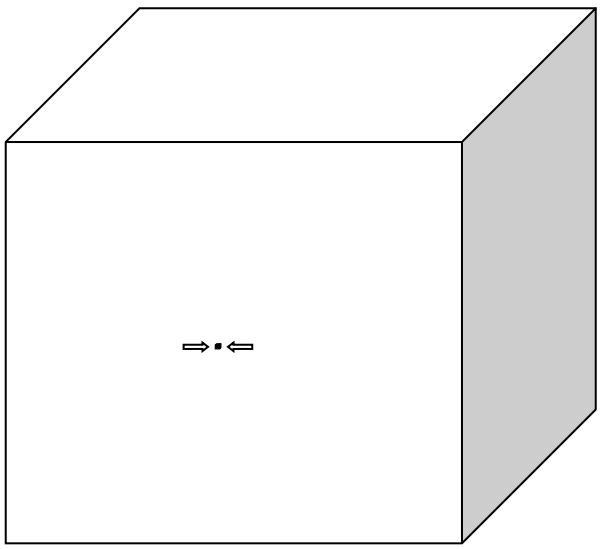
What's Going On Here? - Exercise

Chlorine is widely used for disinfection and as a building block in the manufacture of other chemicals. Safety in the handling and storage of chlorine is essential due to its toxicity.

Chlorine at room temperature is a greenish-yellow gas. It has a characteristic bleach-like odor that can be detected at concentrations lower than the concentration at which adverse health effects occur. Concentration is the amount of substance contained in a certain volume of air. Concentrations of gases and vapors are usually measured in parts per million (ppm).

- One part per million is equivalent to 1 inch in 16.7 miles.
- One ppm is equivalent to one teaspoon in 1,300 gallons.

Schematic of Part Per Million (PPM)



Adverse effects of chlorine exposure include:

- 1-3 ppm: mild eye and nose irritation
- 5-15 ppm: moderate irritation of eyes, nose and lungs
- 30 ppm: immediate chest pain, vomiting, shortness of breath, and cough
- 40-60 ppm: toxic pneumonitis and pulmonary edema
- 430 ppm: lethal after 30 minutes of exposure
- 1,000 ppm: rapid death

Direct skin contact with chlorine can cause chemical burns or frostbite. Chlorine gas is heavier than air, and will hug the ground, accumulating in low places, if it is released to the environment or inside a building.

You and three coworkers are unloading a rail car of chlorine at Station 3 on a hot summer morning, with a light breeze out of the south. A diagram of your worksite is shown on the next page. Three other people are working in the Office Building. At 9:00 AM, you put the unloading system into standby mode, and take your break. Two of your coworkers go to the designated smoking area and you and the other coworker go to the breakroom in the Chlorine Repackaging Building. Twenty minutes later, the workers at the designated smoking area hear a loud pop and observe a jet of chlorine coming from the top of the rail car. The emergency shutoff for the chlorine unloading system is located at Station 2.

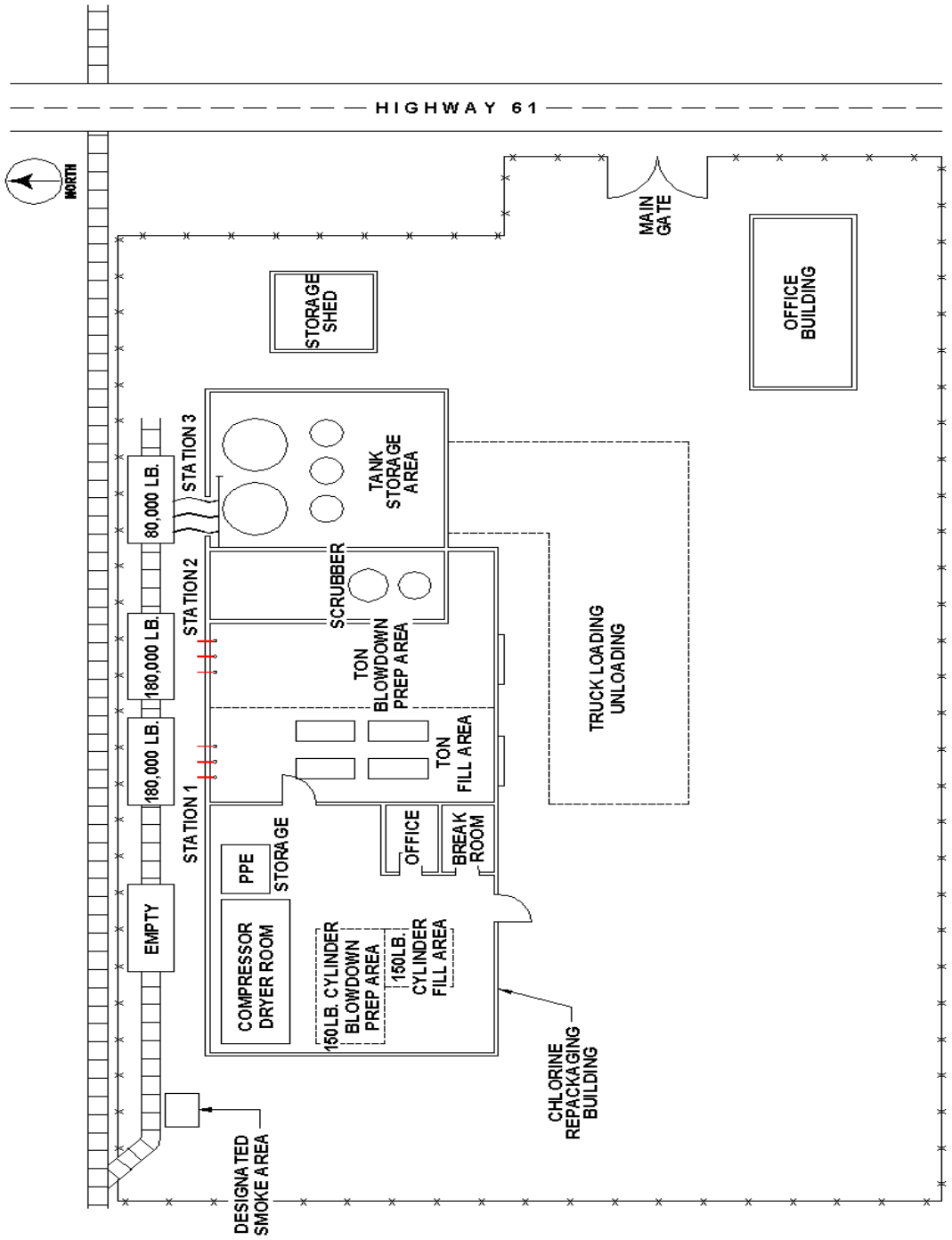
What should these two workers do?

_____

_____

_____

_____


HIGHWAY 61
NORTH
MAIN GATE
STORAGE SHED
OFFICE BUILDING
TANK STORAGE AREA
SCRUBBER
TON BLOWDOWN PREP AREA
TON FILL AREA
TRUCK LOADING UNLOADING
OFFICE
BREAK ROOM
PPE STORAGE
COMPRESSOR DRYER ROOM
150LB. CYLINDER BLOWDOWN PREP AREA
150LB. CYLINDER FILL AREA
CHLORINE REPACKAGING BUILDING
STATION 3
STATION 2
STATION 1
80,000 LB.
180,000 LB.
180,000 LB.
EMPTY
DESIGNATED SMOKE AREA

The two workers from the smoking area exited the plant site after observing the chlorine release. A few minutes later, you and your coworker in the breakroom begin to smell chlorine. You open the breakroom door and observe that the building door near the PPE storage area has been left open, and the building seems to be filling up with mist. Your eyes and nose begin to burn and water. There is a telephone in the breakroom.

What should you and your coworker do?

_____

_____

_____

_____

Write below the information that you would share with community first responders and be ready to discuss your answers with the class.

_____

_____

_____

_____

The Scene

A material may be toxic to the health of people at the scene or can affect others far removed by traveling in the air or entering a waterway or sewer. Flammable or explosive materials may cause a chain reaction that will affect people and property far removed from the actual scene. Approach any scene **upwind** and cautiously. **Stay at a distance upwind and uphill whenever possible.** Use **binoculars** if available.

During the "What's going on here?" Exercise, did you only concentrate on trying to figure out what the hazards were? There may be other important information that concerns the scene, including:

- Dead animals or vegetation
- Injured people
- Nearby buildings
- Other people at or near the scene (actual or probable)
- Wind direction
- Sewers or drains
- Creeks, rivers, or waterways
- Local weather
- Amount of traffic and portion of road that is blocked

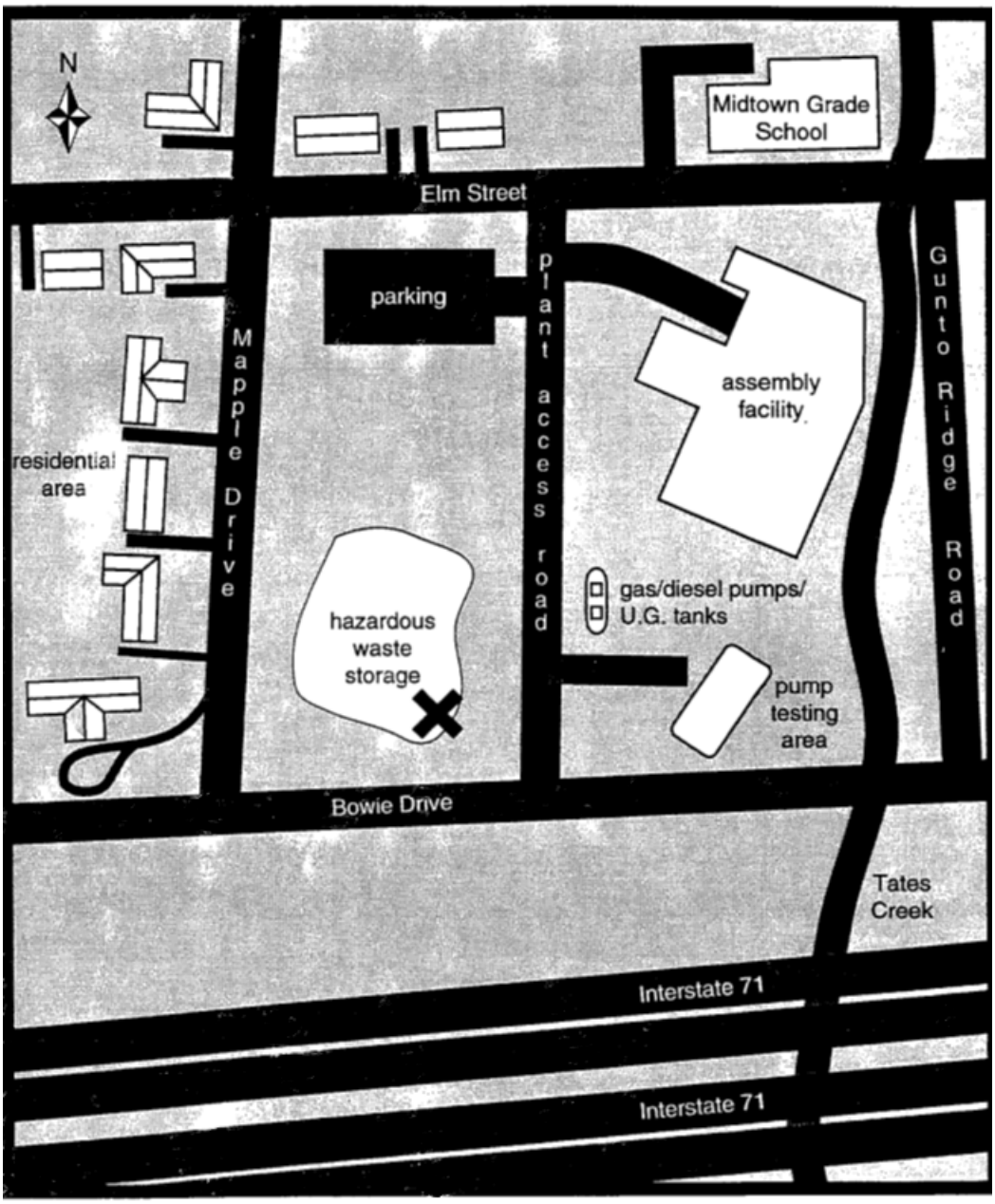
By noting the presence or absence of the items stated above, you will be better able to protect yourself and inform the emergency responders of the information you have gathered. This information allows the emergency responders to better prepare for the response and possible consequences of the incident.

Sizing-Up the Scene Exercise

- During this activity, you will work in groups.
- In your group, appoint one person to take notes and report back to the class.
- The incident is described below, along with a map. The map scale is one inch equals 100 yards.
- Discuss the questions following the scenario with your group and be ready to have class discussion about the incident.

You are exiting the assembly plant where you work. You observe that a tractor-trailer has overturned near the hazardous waste storage pad (**X** on the map). A substance is leaking out of the tanker. It is 2:30 PM on a Friday. Traffic is congested on the freeway.

The DOT placard on the truck is numbered: **2764**. There is a small fire by the cab of the truck. Thunderstorms are rapidly approaching from the northwest. A shift change at the plant will occur at 3:00 PM.



Questions

1. What are all of the potential hazards that may exist in the scene?

_____

_____

_____

_____

2. Where would you observe the scene from?

_____

_____

_____

_____

3. What information should you include in a report of the incident?

_____

_____

_____

_____

4. What is the worst thing that could happen at this scene? (Note: Use only the information that you know about the scene.)

_____

_____

_____

_____

Key Points

- Every situation is different.
- Treat any event as hazardous until *authorized* personnel determine it is safe.
- You should safely collect as much information as possible about an incident before you report it to emergency responders.
- The setting of an incident combines with the hazardous material(s) to create a variety of problems that the emergency responders will have to understand and control.

What Do I Do?

This section tells you steps that you should follow between the time when you have finished sizing-up the scene and when the emergency response team arrives.

Objectives

When complete, you will be better able to:

- Identify the responsibilities of a first-on-the-scene responder
- Identify information that is relevant to provide after leaving the scene

After Sizing-Up the Scene

Your first responsibility at the scene is to notify appropriate personnel of the specifics of the incident while staying safe.

Above all, it is extremely important that **all relevant information** be given when you call in so that the nature and extent of the emergency can be known.

What would you tell them when you call?

Exercise: List the basic information you would report if you had to call in a hazardous materials incident.

What should you tell them when you call?

Take a look at what you said you would report on the previous page. Did your report include all of the things listed below? Your report should include all the following elements from sizing-up the scene and can be structured as:

Who: Who are you?

What: What has happened or is happening?

- rail, highway, or fixed site
- shape of container
- placard/labels
- physical hazards
- wind direction
- others at risk - people in vicinity
- injured persons - conscious or unconscious
- drains, sewers, or surface waters

When: When did you get there?

Where: Where are you?

Where is the scene?

- Office area
- Processing area
- Warehouse area

Before the Emergency Responders Come

After you have notified the appropriate personnel, you should move to a safe area away from hazards or to staging areas designated by emergency response personnel.

You should continue to maintain a safe distance while noting any changes in the scene. Keep up-to-date on what is happening or has happened at the scene so you can give a complete picture of the incident when the emergency responders arrive.

Remember, it is not your responsibility to control or contain the incident.

You have a very important additional responsibility while waiting for the emergency responders to arrive:

Do Not Let Unauthorized People Enter the Scene!!

Remember, you are not a company spokesperson.

There are protocols of who can speak with the media, and that will be part of Incident Command. You should not make any statements to passersby or the news media. Wait for the Emergency Responders; if pushed, refer everyone to the main office.

When Others Arrive

Once the emergency responders and/or Site Control personnel arrive, you will be under the control of the Incident Command System. These are your basic responsibilities in the Incident Command System:

- Provide a complete report to the individual who will assume command and control of the scene. In most states this person will be the Incident Commander until that authority is transferred to another competent authority. This report should include any changes in the incident which have occurred since the report was called in.
- Handle duties as assigned so long as they are within your scope of training or/and expertise.
- If you will not be involved with emergency response or site control, move to a safe area and await further instructions.
- Notify Incident Command before you leave.

When You Leave

It is very important to write a detailed report of your observations and actions. Even if you are not required by the Incident Commander or your employer to write a report, you need one for your own personal protection. You should write this report especially if the incident results in loss of life, significant personal injury, substantial property damage, or causes significant environmental damage. You may be subpoenaed to testify in court about the incident.

The report should include:

- Date and location of incident
- Description of the initial incident and sequence of events (Note times)
- People involved - victims, witnesses, and other responders (names/addresses/agencies)
- Actions you took (in time sequence)
- Your concerns, if any
- Any possible health effects you experienced

Key Points

- **Do** include all relevant information when you call in the incident report
- **Do** keep unauthorized personnel away from the scene
- **Do** report immediately to the Incident Commander when he or she arrives
- **Do** make a written report, even if only for yourself

Review Questions

1. What are the elements of a complete call-in?

2. What are your responsibilities as a first-on-the-scene emergency responder?

3. What should you include in a write-up of the incident?

Putting It All Together

This section will help you to tie together the information that has been presented during this training program.

Objectives

When complete, you will be better able to:

- Identify a correct response upon discovering a hazardous materials incident scene
- Recognize how to protect yourself and others at a hazardous materials incident before emergency responders take control of the scene

Exercise – Putting It All Together

You are working at a facility that manufactures a chemical used in herbicide production. As part of the process, gas from a reactor exits through a scrubber and an incinerator for cleanup. A rupture disc protects the gas pipe from being over-pressured. If the rupture disc breaks because of high pressure, the gas passes through the vent line pipe to be released above the roof of the processing building. This creates environmental pollution, but prevents a potentially more serious accident if the pipe were to rupture. However, if the rupture disc breaks, a weep hole in the vent line pipe also allows some of the gas to enter the building. (See the photograph of the piping on the next page.) The gas contains carbon dioxide, nitrogen and methyl chloride.

Methyl chloride is extremely flammable and symptoms of exposure to the gas include dizziness, confusion and nausea. Its odor is not strong smelling, therefore it may not warn those exposed of dangerous concentrations. Long exposure or exposure to high concentrations can lead to unconsciousness or death.

One Monday morning, you stop in the control room on the second floor of the processing building to talk to your friend, the operator. As you are talking to her, you notice an alarm condition on the control screen of her monitor, and you ask her about it. She tells you that it is the rupture disc monitor that is supposed to alarm if the rupture disc breaks. You ask her if she should be checking that out, and she tells you that it runs on batteries and that it alarms every time that the batteries are low. She tells you not to worry about it.

What should you do?

_____

_____

_____

_____

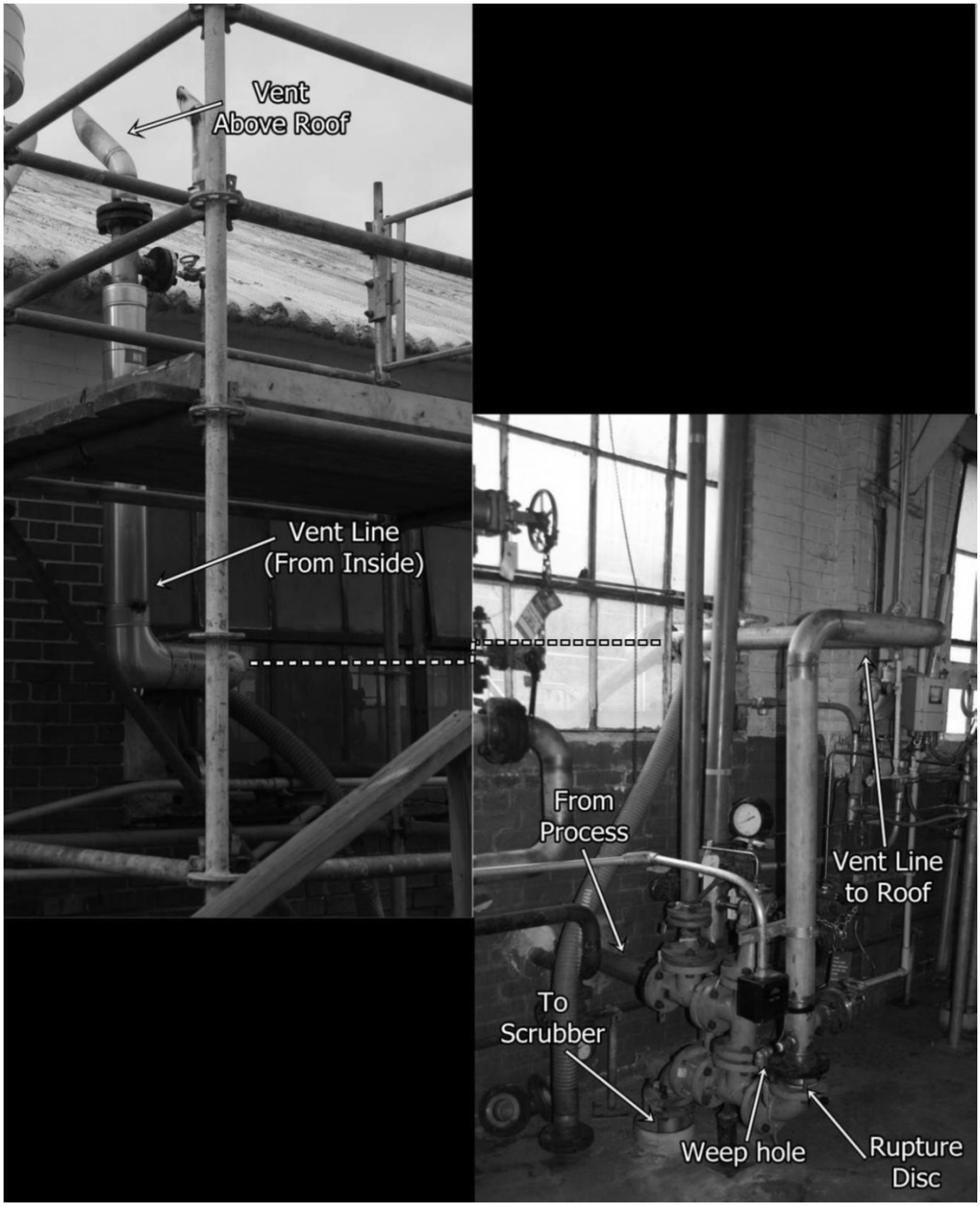
Why isn't the operator responding to the alarm?

_____

_____

_____

_____



Before leaving the building, you walk up to the third floor, where you observe a puddle of liquid on the floor below the weep hole, and what looks like a cloud of steam above it.

Based on an actual incident. See:
http://www.csb.gov/assets/document/CSB%20Final%20Report.pdf

What should you do?

_____

_____

_____

_____

What do you observe at the scene that may be useful to the responders regarding the leaking chemical(s)?

_____

_____

_____

_____

Should you use your cell phone to call emergency responders from the scene? Why or why not?

_____

_____

_____

_____

Where should you wait for emergency responders to arrive?

_____

_____

_____

_____

_____

Closing and Evaluation

Thank you for participating in this program.

This is an opportunity to ask any questions you may have, or to discuss how the knowledge and skills learned can be used at work.

Finally, we ask that you take 10 minutes to complete the program evaluation forms. These are important for improving the program. The Midwest Consortium does take your comments seriously and has made changes in content and the skill exercises based on feedback. Your comments are anonymous.

We hope to see you at another Midwest Consortium program in the future.