

# Section 7

# DOT Placards, Labels, & Emergency Response Guidebook

## Purpose

To understand the uses and limits of the Department of Transportation labels/placards and the Emergency Response Guidebook in a hazardous materials emergency.



# Section 7



**What you will find  
in this section...**

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# Task 1

- **Use the Emergency Response Guidebook and Fact Sheets.**
- **Answer the questions below.**

**Y**ou are the members of the health and safety committee at Federated Heat Treat Company. You have been asked to investigate a situation (described below). Please use the fact sheets that follow and the North American Emergency Response Guidebook to answer the questions on the next page. One of the trainers will first show you how to use the NA Guidebook by following Fact Sheet #1. Here is the situation:

A tanker was unloading its contents to a holding tank just outside the main facility, about 100 feet from the entrance to the loading dock. One of the fittings broke and a cloud of gas started to leak out of the truck. The two loading dock workers noticed the problem and reported it to their supervisor. They were told to keep on working, but to stay inside the loading bay.

Belinda and Don, two pipefitters, were given air purifying respirators and told to stop the flow from the tanker. All they know is that the truck has this placard with these numbers on the outside:



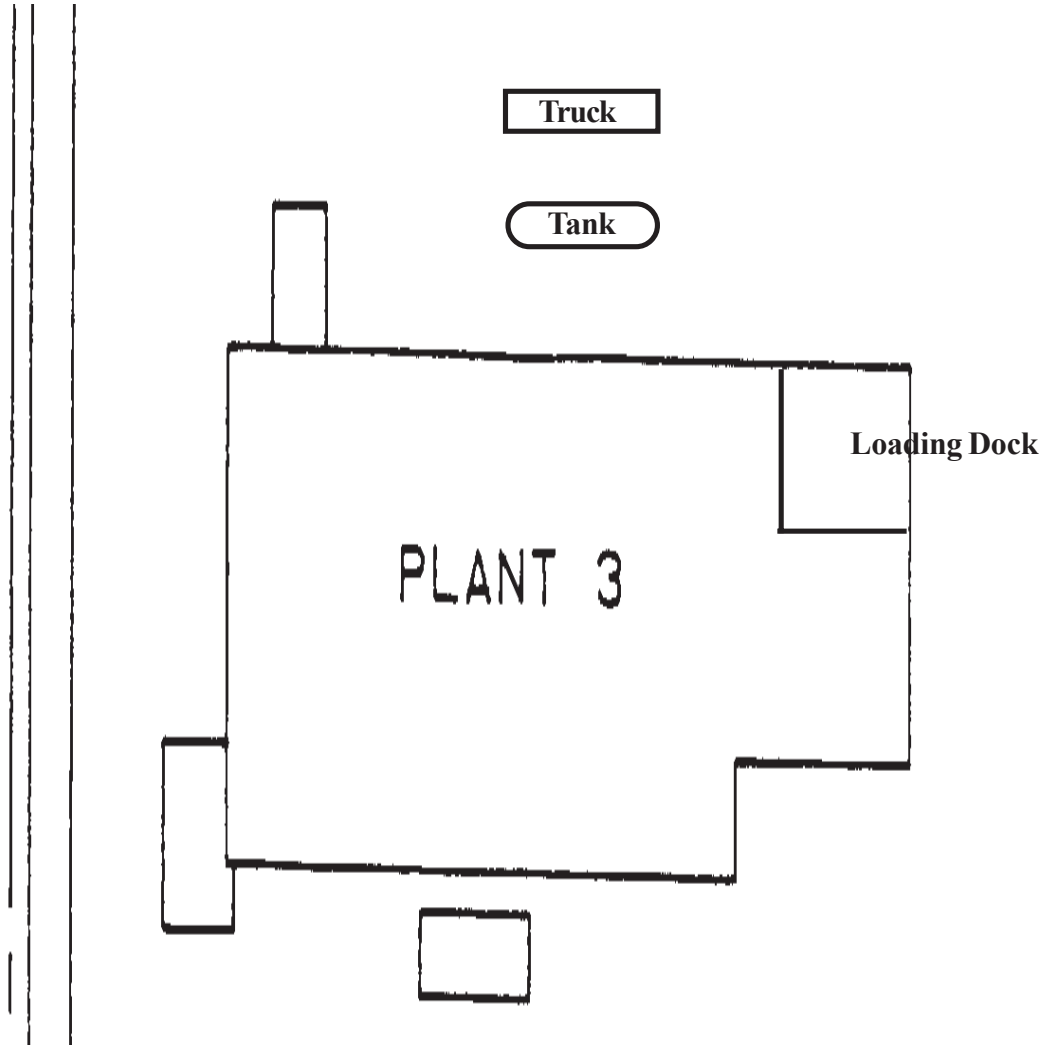
**NOTE: Instructor will read page 7-7**

1005

# Task 1

continued

- Use the Emergency Response Guidebook and Fact Sheets.
- Answer the questions below.



# Task 1

continued

- **Use the Emergency Response Guidebook and Fact Sheets.**
- **Answer the questions below.**

## Questions:

1. What does the single-digit number at the bottom of the placard mean?
2. What does the symbol mean?
3. Based on the 4-digit number, what is the chemical?
4. If a placard on a truck had only the chemical's name written on it, how would you find the 4-digit id number?
5. What orange guide number would you use for an emergency involving this chemical? Would your first concern be for fire or health hazards? How do you know?








## Fact Sheet #1

# What's in the Emergency Response Guidebook?

**T**he North American (NA) Emergency Response Guidebook — the orange book — can help you figure out what chemical has spilled. It also gives some initial actions for emergency responders to take.

### The orange book has 5 sections:

1. **White pages** at the front and back of the book — these pages tell you how to use the book, who to call for help, and the meaning of some terms in the book.
2. **Yellow pages** — if you know the **4-digit number** of the chemical, you can look up the **name and the guide number** in this section. You can get the 4-digit number from the placard or shipping papers. For example, 1193 is MEK, a solvent or cleaner.
3. **Blue pages** — if you know the name of the chemical, you can look up the 4-digit number and the guide in this section.
4. **Orange pages** — the emergency response guides. These are written for fire fighters to give them a quick idea of the **dangers of this chemical and emergency actions** to take. Remember that fire fighters respond to any emergency with self-contained breathing apparatus (SCBA).
5. **Green Pages** — these tell fire fighters how far away to evacuate people. “Isolation distances” are given for chemicals that are high lighted in the yellow and blue sections.

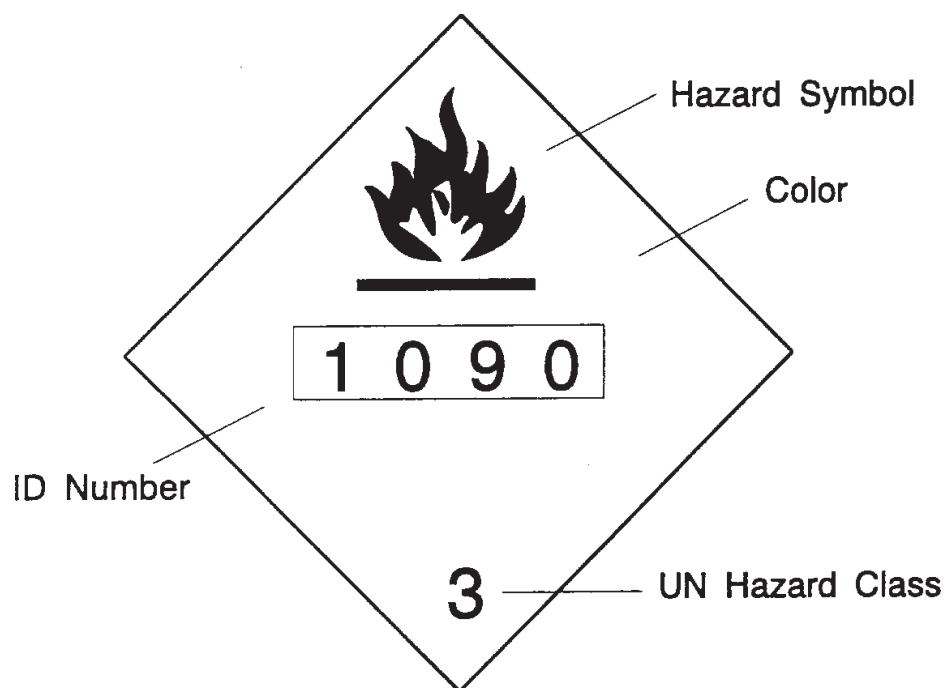
 *The White, Yellow, and Blue sections help you identify the chemical. The Orange and Green guides recommend actions to take. The information in the Orange and Green sections is only good for the first 30 minutes of an emergency.*



## Fact Sheet #2

# How to Read DOT Placards

Department of Transportation (DOT) placards and labels on trucks, trains, and ships can give you quick information on the hazards of what's inside. The DOT system uses 4 clues to alert you to hazards: colors, symbols, class numbers (at the bottom of the diamond), and 4-digit ID numbers. DOT placards and labels look the same, except that placards are bigger. Placards are placed on the outside of trucks, while labels go on smaller containers, such as 55-gallon drums.



## Clues to Help You Size Up the Situation

DOT placards and labels were designed to help emergency responders identify hazards when a truck crashes or a train derails and spills its load. They are meant to be used with the North American Emergency Response Guidebook.

Looking for clues such as labels is one of the first steps in emergency response. You should never handle a haz mat emergency until you








## Fact Sheet #2, continued

know something about the materials involved. Other clues that help you identify a material include:

- ◆ type of container (size, shape, and what it's made of)
- ◆ and location.

### First, Look for the Color and Symbol

In an emergency, you may only see the color of the placard. Even this little bit of information can tell you about the dangers. Here is what the colors and symbols mean:

Color	Hazard Type	Symbol	What Could Happen
Orange	Explosion		Could explode if touched or dropped
Red	Flammable		Could catch on fire, container could explode
White	Poison		Gases could kill quickly
Green	Compressed gas		Container could explode or become a missile
Black & white	Corrosive		Could burn skin, lungs, eyes; could burn metal; could start explosive fire.
Yellow	Oxidizer or radioactive		Could start violent fire or reaction. Could give off radiation.
White and Yellow	Radioactive		Could give off radiation.

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## ***Fact Sheet #2, continued***

### **Next, Look for the 4-Digit Identification Number**

Placards should have a 4-digit identification number in the middle.

- ◆ Use this 4- digit number to look up the chemical in the yellow section of the North American *Emergency Response Guidebook*. This will tell you the name of the product.
- ◆ The 4-digit number must also appear on the shipping papers and the waste manifest.

**Fact Sheet #3**

# The Bottom Number Gets You In the Ball Park

**O**n the bottom of DOT placards and labels is a **1-digit number** called the **United Nations (UN) Hazard Class**. This number tells you what kind of material is inside the container (such as a gas, liquid or solid) and the general type of hazard. Each class has different divisions, too. Sometimes a Class or Division number may replace the symbol on the placard or the written hazard class description on the shipping paper.

## 9 UN Hazard Classes: International System

### Class 1 Explosives

- |              |  |
|--------------|--|
| Division 1.1 | Explosives with a mass explosion hazard      |
| Division 1.2 | Explosives with a projection hazard          |
| Division 1.3 | Explosives with predominantly a fire hazard  |
| Division 1.4 | Explosives with no significant blast hazard  |
| Division 1.5 | Very insensitive explosives; blasting agents |
| Division 1.6 | Extremely insensitive detonating substances  |



### Class 2 Gases

- |              |  |
|--------------|--|
| Division 2.1 | Flammable gas                              |
| Division 2.2 | Nonflammable, non-poisonous compressed gas |
| Division 2.3 | Gas poisonous by inhalation                |
| Division 2.4 | Corrosive gas (Canadian)                   |

### Class 3 Flammable Liquids and Combustible liquids

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## **Fact Sheet #3, continued**

### **Class 4 Flammable solids; Spontaneously combustible materials; and Dangerous when wet material**

Division 4.1 Flammable solids

Division 4.2 Spontaneously combustible materials — these will catch on fire when exposed to air, no spark is needed

Division 4.3 Materials that are dangerous when wet

### **Class 5 Oxidizers and Organic peroxides**

Division 5.1 Oxidizers

Division 5.2 Organic peroxides

### **Class 6 Toxic Materials and Infectious Substances**

Division 6.1 Toxic materials

Division 6.2 Infectious substances

### **Class 7 Radioactive Materials**

### **Class 8 Corrosive Materials**

### **Class 9 Miscellaneous Dangerous Goods**

Division 9.1 Miscellaneous dangerous goods (Canada)

Division 9.2 Environmentally hazardous substances (Canada)

Division 9.3 Dangerous wastes (Canada)

*Source: U.S. Department of Transportation, Office of Hazardous Materials Training and Initiative, 1996 North American Emergency Response Guidebook, Washington, D.C., p. 11.*

## Fact Sheet # 4

# Drawbacks of DOT Placards

**T**he DOT placards are useful tools especially in an emergency. But, the DOT system has some problems that you should know about.

## Drawbacks of Placards and Labels

- **They only tell you about 1 hazard.** Many chemicals have more than one hazard. They can be toxic, corrosive, and flammable. For instance, chlorine is labeled as a poisonous gas, but chlorine also makes other materials burn easily. It is very dangerous in a fire or around flammable materials.
- **They don't tell you about the cancer risk of a chemical or other long term health effects.** For example, the label on a drum of benzene tells you that it will catch on fire easily, but it does NOT tell you that benzene can cause leukemia.
- **The "Dangerous" placard can be used for many different chemicals, or for different chemicals carried in the same truck.**
- **Incorrect placards:** A study found that more than 25% of placards on transportation loads were either wrong or missing.

## Some hazards don't even have to be placarded:

- **Loads of 1000 pounds or less of most dangerous chemicals.** Only a few chemicals, such as very dangerous explosives (1.1, 1.2, and 1.3) have to be placarded no matter what quantity is transported.
- **Hazardous chemicals not regulated by DOT**

*Source: Driver's Guide to Hazardous Materials, J. Currie, American Trucking Assn., 1992.*

**Fact Sheet # 5**

# Use the Yellow Pages to Name the Chemical

The number on a placard is the number you look up in the yellow section of the NA Emergency Response Guidebook. The yellow section tells you the name of the material and which emergency response guide to read in the orange section.

**Number from placard****Yellow section**

<u>ID No.</u>	<u>Guide No.</u>	Name of Material
1164	130	DIMETHYL SULFIDE
1164	130	DIMETHYL SUPHIDE
1165	127	DIOXANE
1166	127	DIOXOLANE
1167	131P	DIVINYL ETHER, inhibited
1168	127	DRIERS, paint or varnish, liquid, n.o.s.
1169	127	EXTRACTS, aromatic, liquid
1170	127	ETHANOL
1170	127	ETHANOL, solution
1170	127	ETHYL ALCOHOL
1170	127	ETHYL ALCOHOL, and solutions
1171	127	ETHYLENE GLYCOL MONOETHYL ETHER

This tells you that the truck with this placard is **carrying ethanol or ethyl alcohol**. This is the kind of alcohol in beer, wine, and hard liquor.

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## **Fact Sheet #5, continued**

The yellow pages also point you to guide number 127. The advice in the guides on the orange pages is very general. Don't take any of these steps unless you have the right protective equipment and training. Remember, as an Operations-level responder, your role is to contain the spill from a safe distance.

*Note: The letter "P" following the guide number means this material can be a polymerization hazard. Here, you can see that divinyl ether, ID number 1167, can polymerize. These chemicals can give off lots of heat or even explode when they are reacting to form long polymer chains.*



## Fact Sheet #6

# Get to the Orange!

The orange pages of the Emergency Response Guidebook have advice for firefighters who are also trained to respond to haz mat emergencies. They give an idea of the dangers and the first steps to take in case of a fire, spill, leak, or when first-aid is needed.

### Each Orange Guide has three parts:

- **Potential Hazards** are grouped under “health hazards” and “fire or explosion hazards.” The greatest danger is listed first.
- **The Public Safety** section covers evacuation and protective clothing. Look at this section for more about safety hazards at emergencies involving this type of chemical.
- **The Emergency Response Action** section tells what to do in case of fire, spills or leaks, and what first aid to give to victims.

The information in the Guides is very general. For instance, the guide will not tell you what kind of chemical suit to wear. You need to check with other resources to find more information. Remember, the guides are only good for the first 30 minutes after an emergency.

The ER Guidebook assumes that the people carrying out the Emergency Response actions have had the proper training and are using the right equipment. **This is not you.**

Even if the Guidebook says so, **DO NOT**:

- ④ Try to stop the spill if you have to get close to it.
- ④ Try to put out a fire.
- ④ Try to rescue someone from a spill.

## Fact Sheet #6, continued

### Here are some of the things you can **DO**:

- ② Tell the incident commander what placards or labels you have seen in a spill.
- ② Build a dike or a ditch to keep the spill from going down a drain or into a stream.
- ② Keep people and traffic away from the spill area.
- ② Work on the decon line if you are needed.

POTENTIAL HAZARDS	EMERGENCY RESPONSE
<p><b>FIRE OR EXPLOSION</b></p> <ul style="list-style-type: none"> <li>• These substances will accelerate burning when involved in a fire.</li> <li>• Some may decompose explosively when heated or involved in a fire.</li> <li>• May explode from heat or contamination.</li> <li>• Some will react explosively with hydrocarbons (fuels).</li> <li>• May ignite combustibles (wood, paper, oil, clothing, etc.).</li> <li>• Containers may explode when heated.</li> <li>• Runoff may create fire or explosion hazard.</li> </ul> <p><b>HEALTH</b></p> <ul style="list-style-type: none"> <li>• Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns, or death.</li> <li>• Fire may produce irritating, corrosive and/or toxic gases.</li> <li>• Runoff from fire control or dilution water may cause pollution.</li> </ul>	<p><b>FIRE</b></p> <p><b>Small Fires</b></p> <ul style="list-style-type: none"> <li>• Do not use dry chemicals, CO<sub>2</sub>, Halon® or foams. Use water only.</li> </ul> <p><b>Large Fires</b></p> <ul style="list-style-type: none"> <li>• Flood fire area with water from a distance.</li> <li>• Move containers from fire area if you can do it without risk.</li> <li>• Do not move cargo or vehicle if cargo has been exposed to heat.</li> <li>• Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.</li> <li>• Cool containers with flooding quantities of water until well after fire is out.</li> <li>• ALWAYS stay away from the ends of tanks.</li> <li>• For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.</li> </ul>
<p style="text-align: center;"><b>PUBLIC SAFETY</b></p> <ul style="list-style-type: none"> <li>• <b>CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.</b></li> <li>• Isolate spill or leak area immediately for at least 10 to 25 meters (30 to 80 feet) in all directions.</li> <li>• Keep unauthorized personnel away.</li> <li>• Stay upwind.</li> <li>• Keep out of low areas.</li> <li>• Ventilate closed spaces before entering.</li> </ul>	<p><b>SPILL OR LEAK</b></p> <ul style="list-style-type: none"> <li>• Keep combustibles (wood, paper, oil, etc.) away from spilled material.</li> <li>• Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.</li> <li>• Stop leak if you can do it without risk.</li> <li>• Do not get water inside containers.</li> </ul> <p><b>Small Dry Spills</b></p> <ul style="list-style-type: none"> <li>• With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.</li> </ul> <p><b>Small Liquid Spills</b></p> <ul style="list-style-type: none"> <li>• Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.</li> </ul> <p><b>Large Spills</b></p> <ul style="list-style-type: none"> <li>• Dike far ahead of liquid spill for later disposal.</li> <li>• <b>Following product recovery, flush area with water.</b></li> </ul>
<p><b>PROTECTIVE CLOTHING</b></p> <ul style="list-style-type: none"> <li>• Wear positive pressure self-contained breathing apparatus (SCBA).</li> <li>• Structural firefighters' protective clothing will only provide limited protection.</li> </ul>	<p><b>FIRST AID</b></p> <ul style="list-style-type: none"> <li>• Move victim to fresh air. • Call emergency medical care.</li> <li>• Apply artificial respiration if victim is not breathing.</li> <li>• Administer oxygen if breathing is difficult.</li> <li>• Remove and isolate contaminated clothing and shoes.</li> <li>• In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.</li> <li>• Keep victim warm and quiet.</li> <li>• Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.</li> </ul>
<p><b>EVACUATION</b></p> <p><b>Large Spill</b></p> <ul style="list-style-type: none"> <li>• Consider initial downwind evacuation for at least 100 meters (330 feet).</li> </ul> <p><b>Fire</b></p> <ul style="list-style-type: none"> <li>• If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.</li> </ul>	

**Fact Sheet #7**

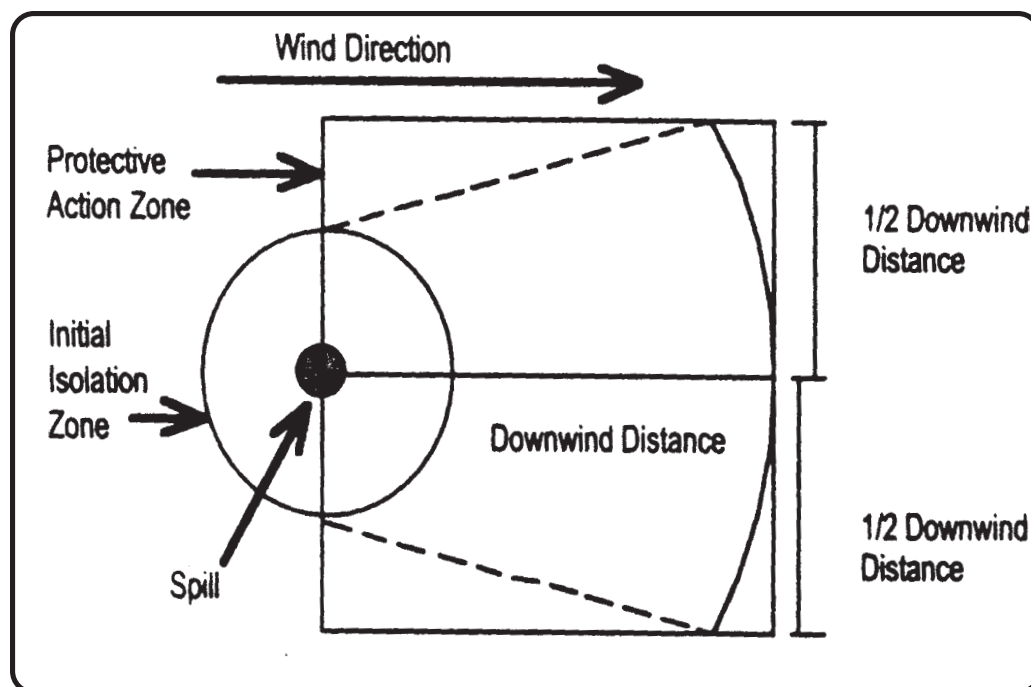
# The Green Guides: The Key to Safe Distances

**T**he green pages are the “**Table of Initial Isolation and Protective Action Distances.**” These pages list chemicals that can form vapor clouds and cause serious health effects.

The green guides give information on **isolation, evacuation and safe distances** for chemicals highlighted in the yellow and blue sections. Clearing people away from the emergency is done to **protect them from inhaling toxic amounts of a chemical** coming from a spill. The green pages do not help to protect people from the danger of fire.

The **Initial Isolation Zone** is the area surrounding the spill (in all directions). Clear all people from this area first.

The **Protective Action Zone** is an area downwind from the spill where a vapor cloud would spread. Evacuate or shelter people in this area next.



The distances in the green guides show areas affected during the first 30 minutes after a spill.

## ***Fact Sheet #7, continued***

### **Before Using the Green Guides**

Answer these four questions before you use the green guides in an emergency:

1. Is there a **fire** or the threat of a fire?

If yes, do not use the green guides. Go back to the orange guides and follow the section on fires. Look at other resource materials, too, such as the MSDS.

2. Is it a **large or small** spill?

A **small** spill generally involves 1 small container: 1 55-gallon drum, 1 small cylinder, or a small leak from a large container.

A **large** spill involves an on-going leak from a large container such as a 1-ton cylinder, or spills from many small containers.

3. Is it **day or night**?

Usually at night, a vapor cloud tends to hold together longer. High levels of the chemical can then travel farther before spreading out and mixing with air.

4. What is the **wind direction**? The area that needs the **most protection** is the area **downwind** from the spill.

*Once you have answered questions 1 - 4, you can turn to the green guides.*

## ***Fact Sheet #7, continued***

### **How To Use a Green Guide**

1. To look up a chemical in the green guide, you must use its 4-digit ID number. If you only had the chemical name, you would have to first look in the blue section to find the ID number. Let's use ammonia as an example. This is what you find if you look up ammonia in the blue section.

### **Blue Section**

<b>Name of material</b>	<b>Guide No.</b>	<b>ID No.</b>
AMMONIA, anhydrous	125	1005

## Fact Sheet #7, continued

- Then go to the green guides, and using the UN number 1005 and the specific name, look up ammonia. You will see:

### Green Section

		SMALL SPILLS (From a small package or small leak from a large package)			LARGE SPILLS (From a large package or from many small packages)		
ID No.	Name of Material	First ISOLATE in all Directions  (Ft.)	Then, PROTECT persons DOWNWIND		First, ISOLATE in all Directions  (Ft.)	Then, PROTECT persons DOWNWIND	
			Day (Mil.)	Night (Mi.)		Day (Mi.)	Night (Mi.)
1005	AMMONIA	100	0.1	0.1	200	0.3	0.7

## **Fact Sheet #7, continued**

The Green Guide tells you to do the following in case of an ammonia spill:

- For small spills (a drum or less), clear everyone within 30 meters (100 feet) in all directions. Then, protect people downwind for 0.2 km (0.1 miles) if the spill is during the day. If the spill is at night (on afternoon or midnight shift), then protect people downwind for 0.2 km (0.1 miles).
- For large spills, clear everyone within 60 meters (200 feet) of the release. Then, protect people downwind within 0.3 miles, if the spill is during the day. If the spill is at night, protect people within 0.7 miles downwind of the emergency scene.

### **Guidebook Designed for Spills Outside**

Remember that the NA *Emergency Response Guidebook* is written for emergencies along highways or railroads. These happen outside where the wind acts as ventilation to carry vapor to a large area, but also to disperse it. “Protecting” people downwind could mean evacuate. Or in some emergencies, it might be safer to keep people inside rather than evacuating them, if they close all vents letting air into the building.

## Fact Sheet #8

# Now Take It Inside

## Spills in Plants

A spill inside a plant is another story.

How far should you clear people from a release inside a facility? It depends on many factors. You have to ask yourself these questions when trying to decide on evacuation distances:

- **How big is the spill?**
- **How toxic is the chemical and how easily does it get into the air?**
- **Where is the spill?** Is it out in the open or in a confined area, like a paint mix room, where vapors can build up quickly? Clear confined spaces immediately if there is a spill of a hazardous chemical.
- **What is nearby?** Are there other chemicals that could react? Are there flames, sparks, or heat that could cause a fire? You would have to clear a larger area if so.
- **Where will the plant ventilation take the vapors or gases?**

*So, HOW FAR do you clear people away from a spill? It's a complicated question. That's why your employer has to figure it out for different chemicals in YOUR PLANT and write it in the Emergency Response Plan.*



## Summary

# DOT Placards and the Emergency Response Guidebook

- ★ **If you see a spill, don't approach!** Look for a placard or label that could help identify the chemical(s), and any other clues to help you assess the dangers of the situation. Report this information to the Incident Commander.
- ★ The NA Emergency Response Guidebook (orange book) tells emergency responders steps to take in the first few minutes of a hazardous materials incident. The information in the Guidebook is only good for the first 30 minutes after a spill, at most.
- ★ Neither the Guidebook nor the DOT placards tell you about all of the dangers. They don't tell you if the material can cause cancer or other long-term health effects. They don't tell you if the material has more than 1 hazard (it burns and is a poison). Look at the MSDS or other resources for this information.
- ★ The major advantages of the Emergency Response Guidebook are that it is easy to carry and quick to use. A major problem for UAW members is that it was **designed for spills that happen outside**, mostly on the road, **not inside industrial facilities**. Evacuation distances inside a plant will be much different, depending on ventilation and layout of the workplace.
- ★ Almost any container could hold hazardous materials. Boxes, bags, barrels, cylinders, and tractor-trailers that carry hazardous chemicals must all be labeled or placarded. The UAW recommends that pipes should be clearly labeled, too.

# Summary

continued

# DOT Placards and the Emergency Response Guidebook

- ★ The green guides in the NA Emergency Response Guidebook are not designed for emergencies inside your facility. Your employer must figure out evacuation distances for different spills in your plant and write them in your emergency response plan.