



# Hazardous Materials First Responder Awareness



Presented by  
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**California Specialized Training Institute (CSTI)**  
**First Responder Awareness Training (FRA)**



University of California at Los Angeles - UCLA  
Labor Occupational Safety and Health - LOSH  
HAZWOPER Project



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**Course Goal:** Identify at least three ways to prepare for and/or prevent hazardous materials (Haz Mat) incidents.

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- Describe the goal of the course.
- Identify at least three government agencies that regulate worker health and safety.

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Objectives – Participants will be able to:

- Describe the role of a First Responder.
- Identify who to notify in case of an emergency.

## Chapter 3: Identifying Hazards

Objectives - Participants will be able to:

- Use various sources to recognize hazardous materials. For example: placards and shipping papers.
- Identify the nine DOT hazard classes.
- Recognize hazards associated with containers.



# Chapter 1



## Introduction

### **Objectives – Participants will be able to:**

- Describe the goal of the course.
- Identify at least three government agencies that regulate worker health and safety.



## **A. Introduction to the Course**

### **A1. Course Goal**

Identify at least three ways to prepare for and/or prevent Haz Mat incidents.

First Responder, Awareness Level (FRA):

First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

1. An understanding of what hazardous substances are, and the risks associated with them in an incident.
2. An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
3. The ability to recognize the presence of hazardous substances in an emergency.
4. The ability to identify the hazardous substance, if possible.
5. An understanding of the role of the first responder awareness individual in the employer's emergency response plan (including site security and control), and the U.S. Department of Transportation's Emergency Response Guidebook.
6. The ability to realize the need for additional resources, and to make appropriate notifications to the communications center.



## **A2. Course Sponsors**

- University of California, Los Angeles  
Labor Occupational Safety and Health Program

UCLA-LOSH: [www.losch.ucla.edu](http://www.losch.ucla.edu)

The goal of the UCLA-LOSH is to improve workplace health and safety conditions through education, research and technical assistance. UCLA-LOSH develops programs for workers, unions, community-based organizations, and employers with an emphasis on labor-management programs and on reaching underserved workers.

UCLA-LOSH is the lead agency of a five-university consortium, the Western Region Universities Consortium (WRUC). WRUC provides Health and Safety Training, Hazardous Materials Emergency Response Training, and Hazardous Waste Training to workers in the western region including California, Oregon, Washington, Arizona, Hawaii, Alaska, the U.S. affiliated islands, and along the U.S. - Mexico border.

## **B. What is a hazardous material (Haz Mat)?**

Definition of a hazardous material in the transportation industry:

Any substance or material, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce.

The term, also called dangerous goods, includes hazardous substances, hazardous wastes, marine pollutants, and elevated temperature materials as defined in this section, 49 Code of Federal Regulations (CFR) 171.8 (Dept. of Transportation)



**See List of Acronyms in appendix**

## C. Government Agencies

The following overview describes key responsibilities of government agencies that have a role in health and safety. Some agencies regulate worker health and safety, some enforce environmental regulations, and others enforce transportation regulations.

For more information, see the websites listed below or contact a representative of the organizations that are sponsoring this course.

### C1. Worker Health and Safety Regulatory Agencies

OSHA: [www.osha.gov](http://www.osha.gov)

The Occupational Safety and Health Administration (OSHA) was created in 1970 to protect the safety and health of workers. OSHA develops and enforces workplace health and safety regulations and provides outreach and training. The regulations require employers to provide a workplace free of health and safety hazards. OSHA has jurisdiction over federal employees and over private sector workers in states that do not have their own state OSHA, and monitors states that choose to have their own OSHA (e.g. California; see Cal/OSHA below).

OSHA regulations are located in Title 29 of the CFR. OSHA 29 CFR 1910.120 (q) contains the emergency response requirements of the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulation. It requires employers to provide training for workers who clean up hazardous waste, who handle hazardous materials, and who respond to emergencies.

Cal/OSHA: [www.dir.ca.gov](http://www.dir.ca.gov)

The California Occupational Safety and Health Administration (Cal/OSHA) is California's state OSHA. It has three main divisions which, together, protect the health and safety of workers in California, develop and enforce regulations, and provide information and assistance such as consultations.

- The Standards Board Division - Establishes health and safety standards (also known as regulations) to protect workers from hazards on the job. For example: Cal/OSHA has regulations to protect against exposure to chemicals, fire and explosion hazards, noise, hot outdoor environments, and unsafe equipment. Regulations are in Title 8 of the California Code of Regulations (CCR).

- The Compliance Division – Enforces regulations by citing and fining employers who are in violation. Employers have the right to appeal the citations.
- The Consultation Division – Provides technical assistance and educational material to employers in order to help them comply with Cal/OSHA regulations. Workers and unions can also obtain information and handouts.

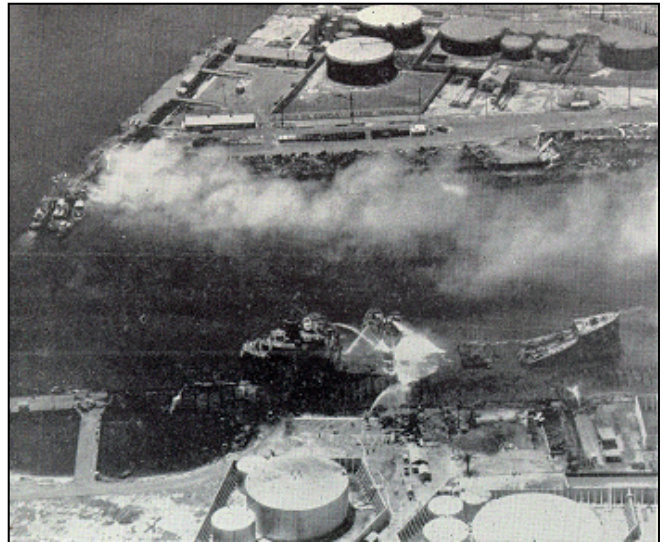
Cal/OSHA General Industry Safety Order (GISO) 5192 is the California equivalent of federal OSHA's HAZWOPER regulation (see above).

## C2. Environmental Regulatory Agencies

EPA: [www.epa.gov](http://www.epa.gov)

The Environmental Protection Agency (EPA) was established in 1970 to protect human health and the environment. The EPA and its regional offices:

- Implement and enforce federal environmental laws such as the Clean Air Act, Clean Water Act, and Superfund.
- Conduct research and risk assessments on environmental chemicals.
- Develop regulations for hazardous substance use, transport, storage, and disposal, as well as for industrial pollution control.
- Initiate and manage hazardous waste cleanup and certify state Treatment, Storage and Disposal Facility (TSDF) permitting programs.



EPA regulations are in Title 40 of the CFR.

Cal/EPA: [www.calepa.ca.gov](http://www.calepa.ca.gov)

The California Environmental Protection Agency (Cal/EPA) was created in 1991 and has similar responsibilities to federal EPA. It is an umbrella agency for several California programs that enforce federal and state environmental laws.

DTSC: [www.dtsc.ca.gov](http://www.dtsc.ca.gov)

The Department of Toxic Substances Control (DTSC) is a department within Cal/EPA responsible for research and hazardous waste site cleanup.

### **C3. Transportation Regulatory Agencies**

DOT: [www.dot.gov](http://www.dot.gov)

The Department of Transportation (DOT) was established in 1966 to ensure a safe and efficient transportation system. The DOT:

- Regulates the movement of hazardous materials by air, highway, rail or water.
- Restores highways and railroads after hazardous materials spills and/or releases.
- Governs hazardous material signs, labeling, placarding, documentation, hauling equipment and licensing of haulers.



DOT requirements for transportation of hazardous materials are in 49 CFR 172.704. For more information visit [www.hazmat.dot.gov](http://www.hazmat.dot.gov)

## **C4. Non-Regulatory Government Agencies**

NIEHS: [www.niehs.nih.gov](http://www.niehs.nih.gov)

The National Institute of Environmental Health Sciences (NIEHS) is a federal agency that conducts research on environmental health. They also fund training programs to ensure that workers involved in hazardous waste cleanup, transportation, and emergency response receive training to do their work safely.

This course was made possible by funding from NIEHS to UCLA-LOSH.

NIOSH: [www.cdc.gov/niosh](http://www.cdc.gov/niosh)

The National Institute for Occupational Safety and Health (NIOSH) is a federal agency that conducts research on workplace hazards. NIOSH advises OSHA as they develop worker health and safety regulations. At the joint request of PMA and ILWU, NIOSH conducted studies in Los Angeles/Long Beach, the San Francisco Bay Area, and Seattle/Tacoma to determine the level of dock worker exposure to diesel pollutants.

NFPA: [www.nfpa.org](http://www.nfpa.org)

The mission of the international nonprofit National Fire Protection Association established in 1896, is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education.

The world's leading advocate of fire prevention and an authoritative source on public safety, NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks.

# Chapter 2



## **Emergency Procedures:**

### **Objectives – Participants will be able to:**

- Describe the role of a first responder.
- Identify who to notify in case of an emergency.





## Scene Management, Site Control, and Safety

When managing a spill, there are three goals to be considered:

1. People                      Life Safety is foremost. All actions must consider Life Safety.
  2. Environment            Protection of the environment from current and new spills.
  3. Property                  Protection of property and business recovery.
- Scene Management helps to protect people, environment and property. Hazardous Waste Clean-up Operations and Emergency Response Operations are required to have a command system in place to bring about these goals.
  - Site Control will be established for emergency response and clean-up operations. 8 CCR 5192(b) requires employers to develop and implement a written health and safety program for employees involved in hazardous waste operations. The program must be designed to identify, evaluate, and control health and safety hazards. It must also provide for emergency response during hazardous waste operations. This is similar to the Injury and Illness Prevention Program (IIPP) found in 8 CCR 3204. To the extent that the IIPP covers the 8 CCR 5192(b) requirements, duplication is not necessary (for example, standard operating procedures created for the IIPP can be universally applied).

### **NO ACTION can be a valid course of action**

## Definition of First Responder and “SIN”

1. Definition of First Responder Awareness and Operations levels:
  - a) **First Responder Awareness:** One who is likely to witness or discover a Haz Mat release and can initiate a response by notifying authorities.  
*No further action is taken.* 29 CFR 1910.120(q)(6)(i),  
Title 8 CCR 5192(q)(6)(A).
  - b) **First Responder Operations:** One who responds to Haz Mat releases for the purpose of protecting nearby persons, environment or property.  
*Operations personnel are trained in a defensive fashion without trying to stop the release.* 29 CFR 1910.120(q)(6)(ii), Title 8 CCR 5192(q)(6)(B).

2. Definition of SIN:

- a) **SAFETY**
- b) **ISOLATION**
- c) **NOTIFICATIONS**

First: Set a Thought

***Safety***



Second: Set a Priority

***Isolate and  
Deny Entry***



Third: Set an Alert

***Notifications***



## A. Set a Thought — SAFETY.

### Do the Right Thing: Stop and Think Before You Act

Your first instinct in an emergency is probably to jump in and help, particularly if a co-worker is in trouble. In a hazardous materials emergency, trying to save someone's life could cost you your own. You could do more harm than good. Workers who respond to hazardous materials emergencies need special training—up to 40 hours and special equipment.

1. The first operational *thought* for everyone = **Safety!**
  - a) Safety starts with the first responder on-scene!
  - b) Responders must have a “Positive Safety Attitude.”
2. Three techniques to ensure safety and a positive safety attitude:
  - a) Safe Approach
  - b) Safe Assessment
  - c) Key Safety Guides for all responders to follow
3. Approach Haz Mat from a safe *direction* (Upwind, Upgrade & Upstream), and a safe *distance* (ERG).
  - a) Do not get close enough for positive identification.
4. Conduct a safe assessment/size-up:
  - a) Remember to keep vehicles headed away from incident.
  - b) Slow vehicle down, shut off air/ventilation, and observe area.
  - c) Use binoculars to identify/assess incident.

See Do's and Don'ts checklist in appendix



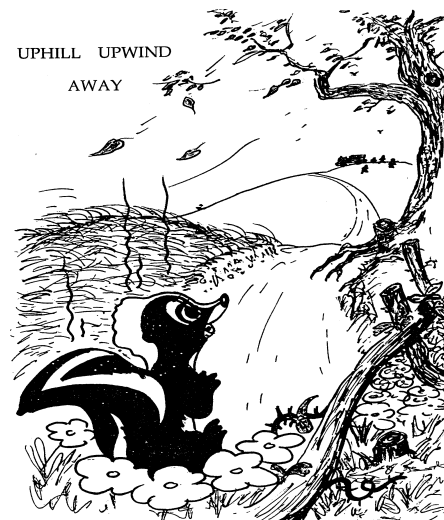
5. Desired First Responder initial actions:

- a) **S**afe approach at a safe distance
- b) **I**solate and deny entry
- c) **N**otify response personnel, agencies.

6. Ten key safety guides on-scene:

- 1. Treat materials as hazardous until proven otherwise. Be cautious.
- 2. Approach upwind, upgrade, and upstream.
- 3. Keep a safe distance until the Identification and Hazard Assessment (IDHA) is complete and the risk is confirmed.
- 4. Isolate and deny entry.
- 5. Establish and observe safety perimeters and control zones.
- 6. Do not rush to victims.
- 7. Do not touch, taste, or breathe unknown released material.  
(Do not assume a vapor is harmless just because you can't smell it.)
- 8. Do not eat, drink, or smoke in incident area.
- 9. Eliminate all ignition sources near incident area, including flares.
- 10. Do not worry about looking foolish. Your health and the health of others are at stake. Think safety!

See Emergency Planning Checklist in appendix



## B. Set a Priority — ISOLATION.

1. The first operational *priority* = Isolate and deny entry!
  - a) Responders can safely attempt to isolate and deny entry by establishing Perimeters via ERG.
  - b) Limit contamination spread and allow for safe working area.

### Perimeters and Zones

First Operational Thought: **Safety**

First Operational Priority: **Isolate & Deny Entry**

#### Perimeter Control Objectives:

- 1) Control “**Entry Points**” (secure doors, stairways, gates, and intersections).
- 2) Control “**Perimeter**” between all Entry Points.
- 3) Control “**Access**” inside Perimeter (including responders).

#### Perimeter Control Tactics:

- 1) Determine size and extent of perimeter (per ERG)
- 2) Identify all entry points
- 3) Control all entry points
- 4) Identify and establish boundaries for Perimeter
- 5) Un-staffed barricades are usually ineffective
- 6) Be aware of ignition sources from vehicles
- 7) Use existing barriers
- 8) Watch out for wind shifts!

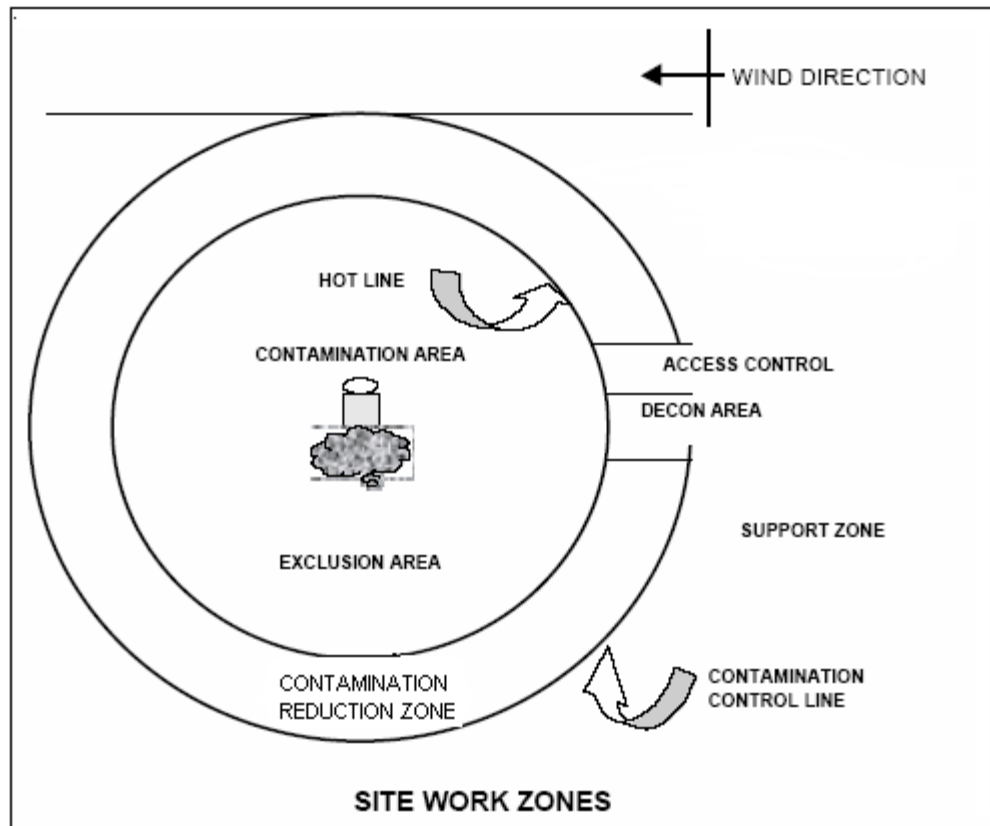


## Set a Priority — ISOLATION (*continued*)

### Examples

*ALSO CALLED:*

<b>Exclusion Zone</b>	Hot Zone	Red Zone	Inner Perimeter
<b>Contamination Reduction Zone</b>	Warm Zone	Yellow Zone	Secondary Perimeter
<b>Support Zone</b>	Cold Zone	Green Zone	Outer Perimeter

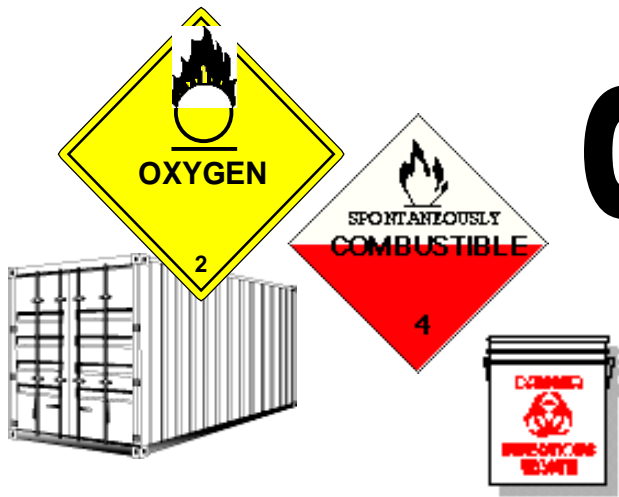


## **C. Set an Alert — NOTIFY**

Communicate with your internal emergency contacts to advise emergency personnel of the event.

General information needed to begin a response should include:

- Location
- Nature of problem
- Potential hazards
- Conditions on-scene :
  - Wind direction
  - What you see
  - What you need
  - What you are doing (have done)



# Chapter 3

## Identifying Hazards

### Objectives – Participants will be able to:

- Use various sources to recognize hazardous materials. For example: placards and shipping papers.
- Identify the nine DOT hazard classes.
- Recognize hazards associated with containers.





## A. Importance of Recognizing Haz Mat Incidents

1. *Any responder* can encounter hazardous materials. According to an ongoing federal government study (ATSDR 1997), of the responders injured in Haz Mat incidents:
  - 18% are law enforcement personnel.
  - 30% are firefighters (paid and volunteer).
  - 17% are medical personnel (EMS and hospital).
  - 35% are other responders (includes in-house response teams).
2. If you don't know it's there, you can't protect yourself.
  - Recognition leads to safety.
  - Safety leads to lives preserved!

## B. Haz Mat Outward Warning Signs

1. People running from or collapsed in the area.
2. Evidence of leak (e.g. fire, smoke, vapors, and unusual colors/odors).
3. Loud roar or increased pitch of an operating relief valve.

Remember: *Assume Haz Mat* and look for clues or warning signs until you confirm the absence of hazardous materials!

## C. Haz Mat Recognition Clues

1. Occupancy/Location
  - Maintenance buildings
  - Vessels
  - Equipment
2. Container Shapes
3. Markings & Colors (e.g. package/label markings or colors)
4. Placards & Labels (e.g. orange placard = explosive)
5. Shipping Papers and Material Safety Data Sheet (MSDS) (e.g. consist for railroad incident)
6. Senses (e.g. sight, hearing and smell - *last resort*)
7. "Clues" are *clues*, not absolutes!

## D. Special Markings

### 1. NFPA 704

National Fire Protection Association (NFPA) designed a warning system known as NFPA 704 Labeling System to identify chemical hazards at fixed facilities. Four diamonds within a diamond indicate the risk in an emergency situation and identify hazards by colors and numbers.

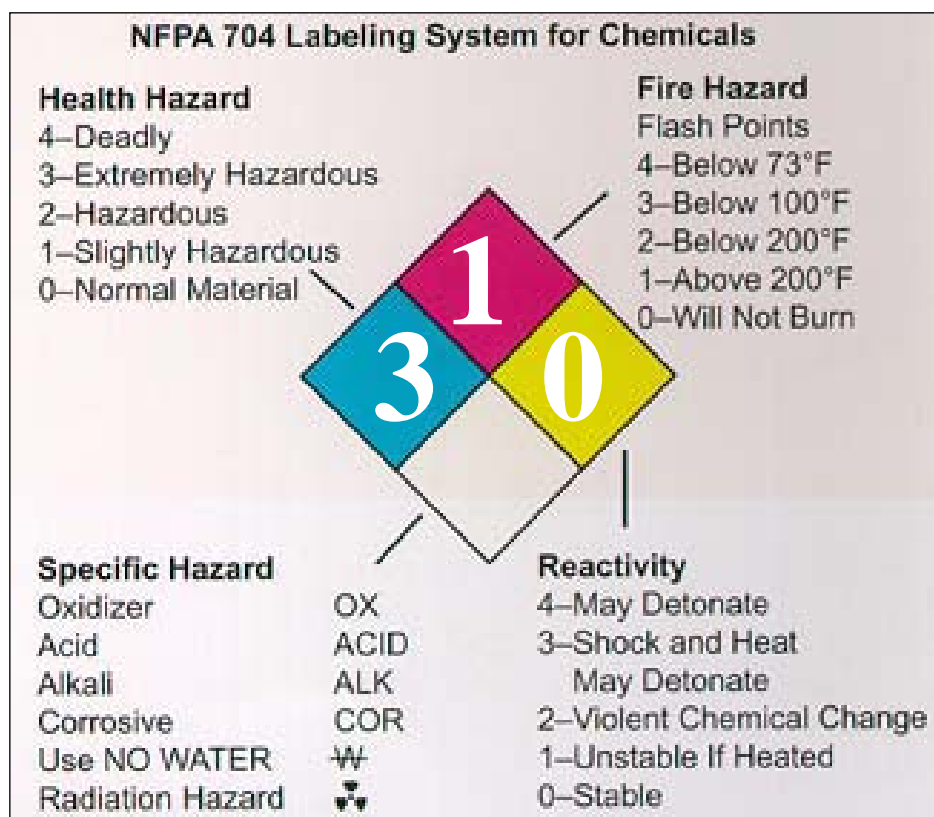
#### a) Colors

- Blue - Health
- Red - Fire
- Yellow - Reactivity or stability
- White - Special hazards

#### b) Numbers

Number rating from 0 to 4 with 4 being the highest hazard.

***Designed for fire fighters to identify chemical hazards during a fire.***



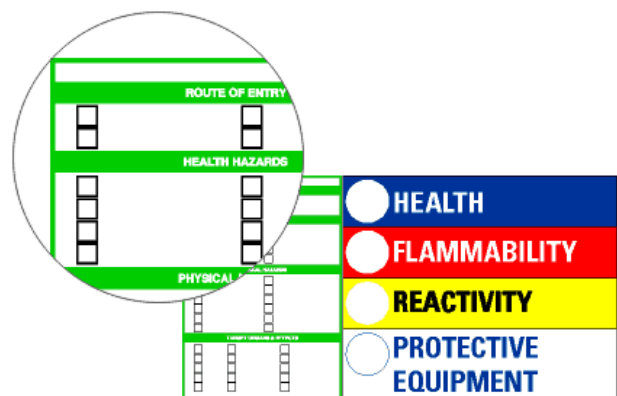
## 2. Hazard Communication Markings

### Hazardous Materials Identification System® (HMIS®)

**History** More than ten years ago, the National Paints and Coatings Association (NPCA) developed a voluntary method of hazard communication compliance called the Hazardous Materials Identification System® (HMIS), and made it available to the coatings industry as a hazard communication compliance tool. In 1996, NPCA modified and reissued HMIS®.

**System** The system uses color-coded labels with numbers and symbols to present acute and chronic health, flammability, and reactivity hazard warnings, as well as to designate appropriate personal protective equipment (PPE). The color scheme and hazard ranking is similar to NFPA 704, but don't confuse it with NFPA 704.







CHEMICAL NAME	
HEALTH	<input type="text"/>
FLAMMABILITY	<input type="text"/>
PHYSICAL HAZARD	<input type="text"/>
PERSONAL PROTECTION	



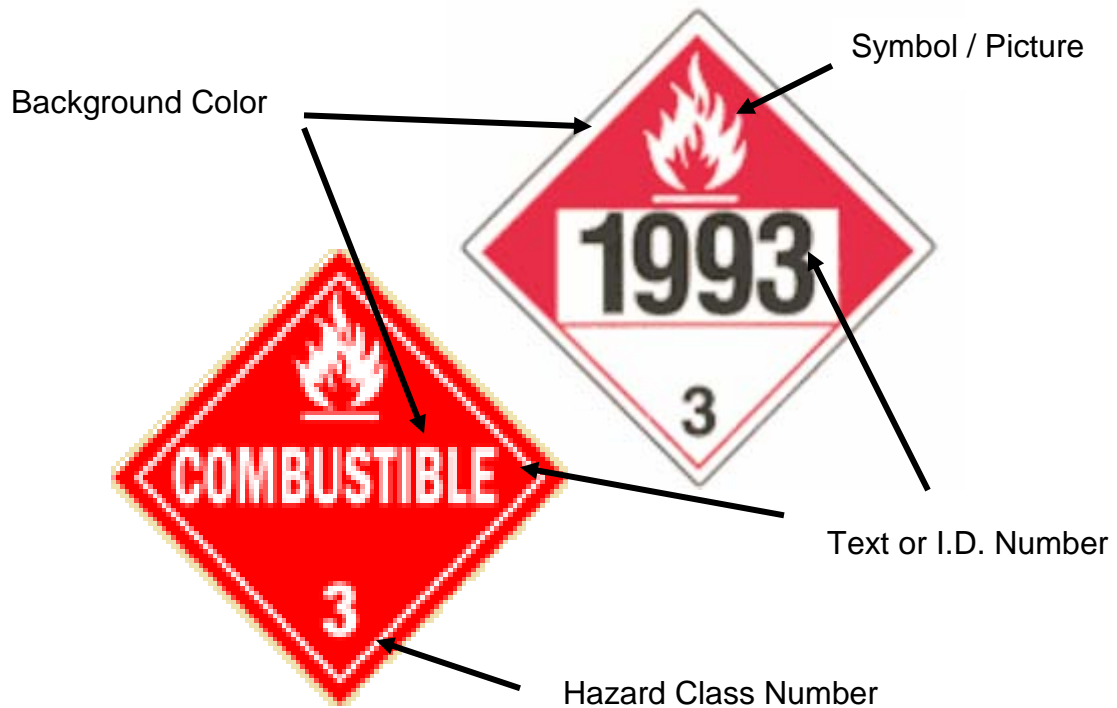
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM	
HAZARD INDEX	PERSONAL PROTECTION INDEX
<p>4 = SEVERE HAZARD</p> <p>3 = SERIOUS HAZARD</p> <p>2 = MODERATE HAZARD</p> <p>1 = SLIGHT HAZARD</p> <p>0 = MINIMAL HAZARD</p> <p>An asterisk (*) or other designation corresponds to additional information on a data sheet or separate chronic effects notification</p> <p>Additional Information</p>	<p><b>A</b> </p> <p><b>B</b> </p> <p><b>C</b> </p> <p><b>D</b> </p> <p><b>E</b> </p> <p><b>F</b> </p> <p><b>G</b> </p> <p><b>H</b> </p> <p><b>I</b> </p> <p><b>J</b> </p> <p><b>K</b> </p> <p><b>X</b> Consult your supervisor or S.O.P. for "SPECIAL" handling directions</p>
PERSONAL PROTECTION EQUIPMENT	
<p><b>A</b>  Safety Glasses</p> <p><b>n</b>  Safety Goggles</p> <p><b>o</b>  Face Shield or Full Facepiece Respirator</p> <p><b>p</b>  Gloves</p> <p><b>q</b>  Boots</p> <p><b>r</b>  Synthetic Apron</p> <p><b>s</b>  Full Suit</p> <p><b>t</b>  Full Facepiece Respirator</p> <p><b>u</b>  Hood and Boots</p> <p><b>w</b>  Chemical Resistant Gloves</p> <p><b>y</b>  Full Facepiece Respirator</p> <p><b>z</b>  Full Facepiece Respirator</p>	

### 3. Military Markings - DOD Hazard Identification System.

The Department of Defense (DOD) established a standard firefighting hazard identification system for all DOD facilities. This system classifies fires involving ammunition or explosives into four divisions according to the hazard they present to emergency responders. (Note: Use of these symbols is at the discretion of the base commander. Under some conditions, security considerations may make it undesirable to identify storage locations of munitions.)

Fire Division – Class 1	Hazard	Symbol Shape
Division 1	Mass Explosion	 Octagon
Division 2	Explosion with fragment hazard	 Cross
Division 3	Mass fire	 Inverted triangle
Division 4	Moderate fire	 Diamond
No Water		
Wear Protective Mask		

## 1. Department of Transportation (DOT) Haz Mat Placards and Labels



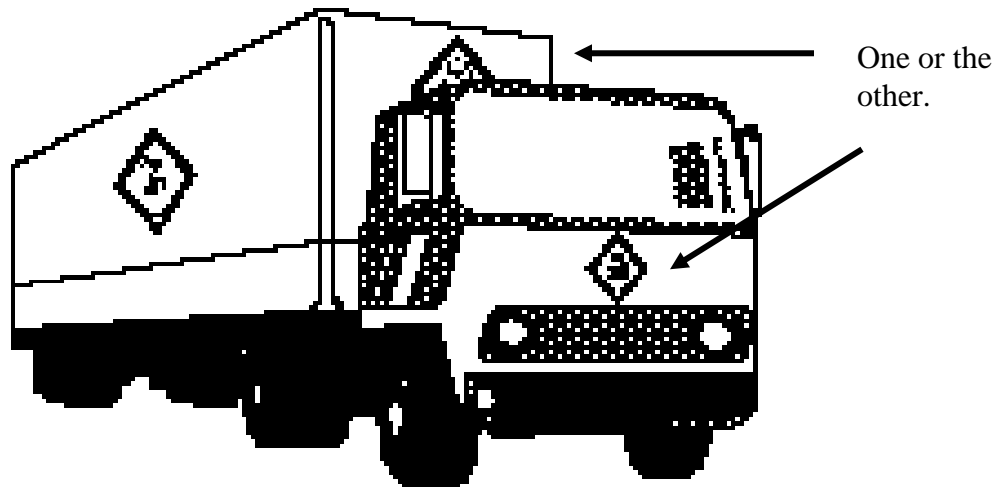
### Hazardous Materials by Class Numbers:

- Class 1 - Explosive
- Class 2 - Gases
- Class 3 - Flammable/Combustible Liquids
- Class 4 - Flammable Solids
- Class 5 - Oxidizers
- Class 6 - Toxins
- Class 7 - Radiation
- Class 8 - Corrosive
- Class 9 - Miscellaneous

The class number is the number located on the bottom corner of the label or placard.

**See Hazard classification system in appendix DOT Placarding Requirements (49 CFR 172.504)**

**Display** - Placard must be displayed on each side and each end of bulk packaging, freight container, unit load device, transport vehicle, or rail car.



**Dangerous** Placards may be used on a freight container, unit load device, transport vehicle or rail car containing two or more categories of hazardous materials with a combined weight of 1,001 pounds or more, which require different placards specified in Table 2. If they load more than 2,205 lbs of one category of a hazardous material at one loading facility then they must use the placard for that category in addition to any other required placards or the “Dangerous” placard.

One exception to regulations allows shipments of hazardous materials of less than 1,001lbs aggregate gross weight of table 2 to be shipped without *any* placards.

**Subsidiary Hazards** The regulations *require* some hazardous materials to include placards for subsidiary hazards and may require the use of additional placards for other hazardous materials that have subsidiary hazards. If the subsidiary hazard is “Dangerous When Wet” or “Poison Inhalation Hazard”, then the shipment must display placards indicating those hazards.

**See Table 1 and 2 on placarding in appendix.**

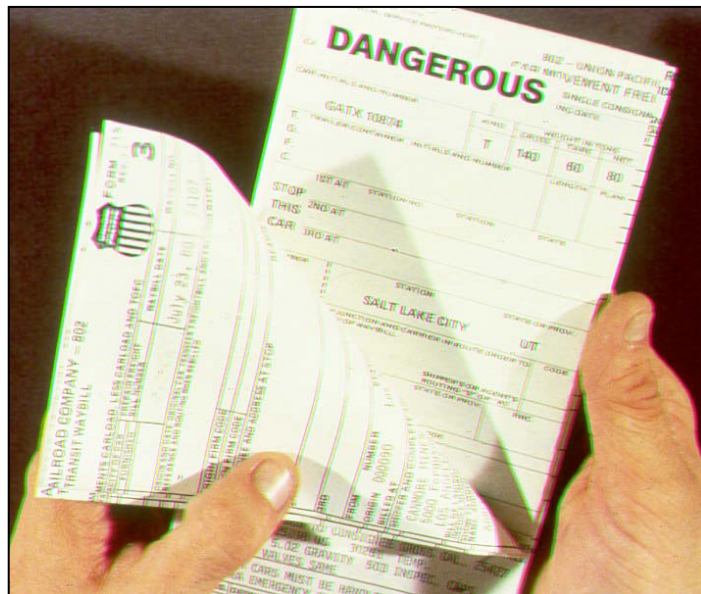




- *Waybill and Consist (With conductor or member of the crew on a train)* “A member of the crew...must have a copy...” (49 CFR 174.24) (may be computerized copy)

A **waybill** is a document issued by a carrier giving details and instructions relating to the shipment of a consignment of goods. Typically it will show the names of the consignor and consignee, the point of origin of the consignment, its destination, route, and method of shipment..

A **consist** is a list of the car and their contents and should be in order from engine to rear.



- *Dangerous Cargo Manifest (On bridge of vessel)*  
“This document [Dangerous Cargo Manifest] must be kept in a designated holder on or near the vessel’s bridge.” (49 CFR 176.30)

A **DCM** is a shipping paper that contains all of the contents being carried by the transporting vehicle or vessel.

- *Air Bill (With pilot in cockpit)*

b) **Material Safety Data Sheet (MSDS)**

“Employers shall have a MSDS *in the workplace* for each hazardous chemical they use.” [29 CFR 1910.1200(g)]

The purpose of Material Safety Data Sheets is to provide the information necessary to safely use chemicals that can cause illness, injury, or death. They are written in an order that precise information is quickly accessible to anyone who knows how to use an MSDS.

An MSDS describes what it is about a chemical that makes it dangerous, what level of personal protective equipment is needed, how to respond to spills and accidents, and how to get more information.

The following information is required by the Hazard Communication Standard:

<b>Manufacturer's Information</b>	Identity as shown on label. How to contact the manufacturer
<b>Hazardous Ingredients</b>	Names of chemicals, PELs, TLVs, and percentages of each chemical in the product
<b>Physical and Chemical Characteristics</b>	Weight, odor, color, etc
<b>Fire and Explosion data</b>	Flammability and combustibility, LEL, UEL, and flash pint
<b>Reactivity Data</b>	Reactions with other substances
<b>Health Hazard Data</b>	Effects on health including symptoms
<b>Precautions for Safe Handling</b>	Spills, leaks, and disposal
<b>Control Measures</b>	Ventilation, PPE, and work practices


Source: IUOE National Training Fund National HAZMAT Program

Some MSDSs present information more completely and are easier to understand than others. Although MSDSs are extremely useful, just making them available does not discharge the employer's responsibility to provide any information and equipment required to minimize exposure.

## Limitations of MSDSs

Some MSDSs can tell you a lot about the hazards of a chemical. They may be the only source of information about chemicals at a workplace. Yet, many MSDSs are missing valuable information. They may use a lot of technical words and can be hard to understand. Others are out of date or contain inaccurate information.

Remember, all MSDS's are not created equal. Do not rely on the MSDS sheets alone. Try using other sources of information as well.

 <b>BOC GASES</b> <b>MATERIAL SAFETY DATA SHEET</b>				
<b>PRODUCT NAME:</b> OXYGEN, REFRIGERATED LIQUID				
<b>1. Chemical Product and Company Identification</b>				
<b>BOC Gases,</b> <b>A Division of</b> <b>The BOC Group, Inc</b> <b>575 Mountain Avenue</b> <b>Murray Hill, NJ 07974</b>		<b>BOC Gases,</b> <b>A Division of</b> <b>BOC Canada Ltd.</b> <b>89 Queensway West</b> <b>Mississauga, Ontario L5B 2V2</b>		
<b>TELEPHONE NUMBER:</b> (908)464-8100 <b>24-HOUR EMERGENCY TELEPHONE NUMBER:</b> <b>CHEMTREC (800)424-9300</b>		<b>TELEPHONE NUMBER:</b> (905)273-7700 <b>24-HOUR EMERGENCY TELEPHONE NUMBER:</b> <b>(905)949-3777</b> <b>EMERGENCY RESPONSE PLAN NO:</b> 20101		
<b>PRODUCT NAME:</b> OXYGEN, REFRIGERATED LIQUID <b>CHEMICAL NAME:</b> Oxygen <b>COMMON NAMES/SYNONYMS:</b> Liquid Oxygen, LOX <b>TDG CLASSIFICATION:</b> 2.2 (5.1) <b>WHMIS CLASSIFICATION:</b> A, C				
<b>PREPARED BY:</b> Loss Control (908)464-8100/(905)273-7700 <b>PREPARATION DATE:</b> 12/21/95 <b>REVIEW DATES:</b> 12/21/95 <b>LATEST REVISION DATE:</b> 12/21/95 <b>PREVIOUS REVISION DATE:</b> None				
<b>2. Composition, Information on Ingredients</b>				
<b>INGREDIENT</b>	<b>% VOLUME</b>	<b>PEL-OSHA<sup>1</sup></b>	<b>TLV-ACGIH<sup>2</sup></b>	<b>LD<sub>50</sub> or OC<sub>50</sub> Route/Species</b>
Oxygen FORMULA: O <sub>2</sub> CAS: 7782-44-7 RTECS #: RS2060000	99.6 to 99.997	Not Available	Not Available	Not Available
<sup>1</sup> As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993) <sup>2</sup> As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents				
<b>3. Hazards Identification</b>				
<b>EMERGENCY OVERVIEW</b> Elevated oxygen levels may result in cough and other pulmonary changes. High concentrations of oxygen (greater than 75%) causes symptoms of hyperoxia which included cramps, nausea, dizziness, hypothermia, ambylopia, respiration difficulties, bradycardia, fainting spells and convulsions capable of leading to death. Nonflammable. Oxidizer, will accelerate combustion. Contact with liquid form may cause frostbite or freeze burns in exposed tissues.				

# Appendix

The information is designed to enhance knowledge and add support to field activities.

Acronyms & Abbreviations.	A.3
Recognition – Common Vehicle Shapes	A.6
“Do this list!” – What to do at a Haz Mat incident.	A.7
“Don’t do this list!” – What NOT to do at a Haz Mat Incident.	A.8
Hazard Classification System	A.9
DOT Placarding Tables 1 & 2.	A.10



## Acronyms and Abbreviations

AMS	Area Maritime Security
ACGIH	American Conference of Governmental Industrial Hygienists
AFFF	Aqueous Film Forming Foam
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
AOR	Area of Responsibility
APR	Air Purifying Respirator
ATSDR	Agency for Toxic Substances and Disease Registry
AQMD	Air Quality Management District
BLEVE	Boiling Liquid Expanding Vapor Explosion
CAC	California Administrative Code
CAER	Community Awareness/Emergency Response Program
CAL-OSHA	California Occupational Safety and Health Administration
CAS	Chemical Abstracts Service
CCR	California Code of Regulations
Ca	Carcinogen
CEEL	Community Emergency Exposure Level
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CGC	California Government Code
CHEMTREC	Chemical Transportation Emergency Center
CHLOREP	Chlorine Emergency Program
CHRIS	Chemical Hazards Response Information System
C	Ceiling
CIH	Certified Industrial Hygienist
CMA	Chemical Manufacturer's Association
COTP	Captain of the Port
CPC	Chemical Protective Clothing
CRWQCB	California Regional Water Quality Control Board
CUPA	Certified Unified Program Agency
CWA	Clean Water Act (1972)
DOE	Department of Energy
DOT	Department of Transportation
DOFF	take off (defensive off)
DON	put on (defensive on)
DTSC	Department of Toxic Substances Control
EOC	Emergency Operations Center
EOD UNIT	Explosives Ordnance Disposal Unit
EPA	Environmental Protection Agency
ERD	Emergency Response Division (EPA)
ERG	Emergency Response Guidebook
EHS	Extremely Hazardous Substance
EMS	Emergency Medical Service

EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FHSA	Federal Hazardous Substance Act (1960)
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRESCOPE	Fire Fighting Resources of California Organized for Potential Emergencies
FOSC	Federal On-Scene Coordinator
FRA	First Responder Awareness
FRO	First Responder Operations
FSO	Facility Security Officer
FWPCA	Federal Water Pollution Control Act (1972) = CWA
GISO	General Industrial Safety Orders
HAZ MAT	Hazardous Material
HAZWOPER	Hazardous Waste Operation and Emergency Response
HEPA	High Efficiency Particulate Air filter
HHS	U. S. Department of Health and Human Services
HMTA	Hazardous Materials Transportation Act
HSAS	Homeland Security Advisory System
IC	Incident Commander
ICS	Incident Command System
ICP	Incident Command Post
IDHA	Identification and Hazard Assessment
IDLH	Immediately Dangerous to Life or Health
IED	Improvised Explosive Device
JSLIST	Joint Service Light Weight Integrated Suit Technology
IMO	International Maritime Organization
LC LO	Lethal Concentration, low
LC 50	Lethal Concentration, 50%
LD 50	Lethal Dosage, 50%
LOP	Level of Protection
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Committee
mg/m <sup>3</sup>	Milligrams per cubic meter
MARSEC	Maritime Security
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
MOPP	Mission Oriented Protective Posture
NBC	Nuclear, Biological & Chemical
NCP	National Contingency Plan
NCRIC	National Chemical Response and Information Center
NEPA	National Environmental Policy Act (1970)
NIEHS	National Institute of Environmental Health Sciences
NIH	National Institutes of Health
NFPA	National Fire Protection Association
NIIMS	National Interagency Incident Management System
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NOS	Not Otherwise Specified
NRC	National Response Center

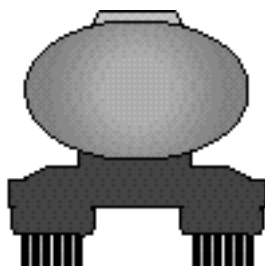
NSC	National Safety Council
NSF	National Strike Force
OES	Office of Emergency Services (State or County)
OPA '90	Oil Pollution Act of 1990
ORM	Other Regulated Material
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
OSPR	Office of Oil Spill Prevention and Response
PEL	Permissible Exposure Limit
PIO	Public Information Officer
PPB	Parts Per Billion
PPE	Personal Protective Equipment
PPM	Parts Per Million
PAPR	Powered Air Purifying Respirator
pH	power of Hydrogen
RCRA	Resource Conservation and Recovery Act (1976)
REL	Recommended Exposure Limits (NIOSH)
RQ	Reportable Quantity
RTECS	Registry of Toxic Effects of Chemical Substances
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCBA	Self-Contained Breathing Apparatus
SDWA	Safe Drinking Water Act (1974)
SEMS	Standardized Emergency Management System
STCC	Standard Transportation Commodity Code
SERC	State Emergency Response Commission
STEL	Short Term Exposure Limit
SWRCB	State Water Resources Control Board
TLV	Threshold Limit Value
TLV-STLV	Short Term Limit Value
TSCA	Toxic Substances Control Act (1976)
TSCD	Toxic Substances Control Division
TSDf	Treatment, Storage and Disposal Facility
TWA	Time Weighted Average
UL	Underwriter's Laboratories
USCG	U. S. Coast Guard
USDOT	U. S. Department of Transportation
USEPA	U. S. Environmental Protection Agency (EPA)
USFWS	U. S. Fish and Wildlife Service
USNRC	U. S. Nuclear Regulatory Commission
WMD	Weapons of Mass Destruction
VOC	Volatile Organic Compound
VSP	Vessel Security Plan



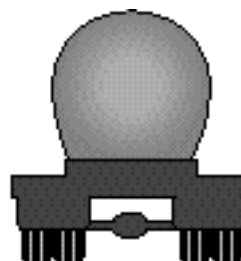
# Recognition—Common Vehicle Shapes

## Shapes of truck containers

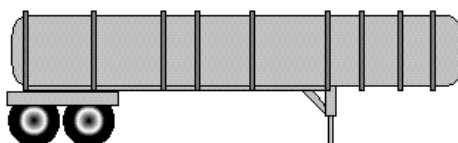
**MC 306/DOT 406**  
**Low pressure**



**MC 307/DOT 407**  
**Low pressure/vacuum**



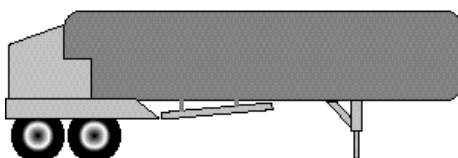
**MC 312/DOT 412**  
**Low pressure/vacuum**



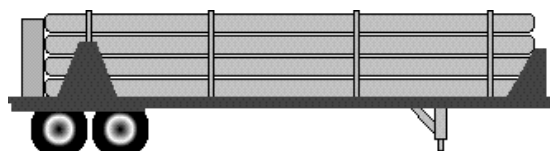
**MC 331**  
**Pressure**



**MC 338**  
**Low pressure/cryogenic**  
**Pressure when heated**



**MC 331 ("tube trailer")**  
**Pressure**



## Do This List!

What to **do** at a hazardous materials incident.

<b>DO</b>	think safety and consider it a big deal!!!
<b>DO</b>	stay upwind, uphill and away.
<b>DO</b>	isolate and deny entry.
<b>DO</b>	establish perimeters and observe zones.
<b>DO</b>	notify and request assistance early.
<b>DO</b>	establish command.
<b>DO</b>	have alternative plans and consider no action.
<b>DO</b>	recognize your limits.
<b>DO</b>	forecast your intervention and expect change.
<b>DO</b>	weigh risk against gain (benefits).
<b>DO</b>	maintain control of the incident.
<b>DO</b>	evacuate and warn public early.
<b>DO</b>	communicate & coordinate with other agencies.
<b>DO</b>	ensure the safety of all on-scene personnel!
<b>Terminal Specific Do's</b> <i>(fill in your needs)</i>	
<b>DO</b>	
<b>DO</b>	
<b>DO</b>	

# Don't Do This!

What **not** to do at a hazardous materials incident.

<b>DON'T</b>	be overly aggressive.
<b>DON'T</b>	have a negative safety attitude.
<b>DON'T</b>	get coaxed into a bad situation.
<b>DON'T</b>	touch, breathe or swallow it.
<b>DON'T</b>	act without a plan.
<b>DON'T</b>	lose sight of your mission.
<b>DON'T</b>	act on emotion.
<b>DON'T</b>	confuse rescue with evacuation.
<b>DON'T</b>	believe everything you're told.
<b>DON'T</b>	intervene unless sure of positive outcome.
<b>DON'T</b>	drive through spills or clouds.
<b>DON'T</b>	pick up or move containers needlessly.
<b>DON'T</b>	key in on only one hazard.
<b>DON'T</b>	become a victim.
<b>DON'T</b>	let small amounts fool you.
<b>DON'T</b>	use flares.
<b>DON'T</b>	be lulled into a false sense of security.
<b>DON'T</b>	fail to competently respond to the event!
<b>Terminal Specific Don'ts</b> <i>(fill in your needs)</i>	
<b>DON'T</b>	
<b>DON'T</b>	

## Hazard Classification System.

Class 1	Any substance, article or device designed to function by explosion (extremely rapid release of gas and heat).
Class 2	Flammable gas: Ignitable at low concentrations (<13%).
	Compressed gas: Shipped at >41 psia.
	Poisonous gas: Toxic to humans or hazardous to health (or LC <sub>50</sub> of not more than 5000 ml/m <sup>3</sup> for laboratory animals). (i.e. Toxic in low concentrations.)
Class 3	Flammable Liquid: Flash point <141°F.
	Combustible Liquid: Flash point >141°F. (100°-200°F for domestic shipments.)
Class 4	Explosives shipped with sufficient wetting agent to suppress explosive properties.
	Substance that can ignite if in contact with air <5 minutes.
	Substance that gives off flammable or toxic vapors or is spontaneously flammable upon contact with water.
Class 5	A material that can cause or enhance the combustion of other materials (usually by giving up oxygen.)
Class 6	Toxic to humans, hazardous to human health or presumed toxic to humans based upon tests on laboratory animals.
Class 7	Substance with specific activity > 0.002 micro-curies per gram.
Class 8	Substance that causes visible destruction or irreversible alterations in human skin tissue or a liquid that has a severe corrosion rate on steel or aluminum.
Class 9	Material with anesthetic, noxious or similar property that could cause extreme annoyance or discomfort to flight crew and prevent performance of assigned duties. <i>Does not meet the definition of any other class.</i>

## DOT Placarding Tables

**Table 1**

Category	Placard Name	49 CFR §
1.1	EXPLOSIVES 1.1	172.522
1.2	EXPLOSIVES 1.2	172.522
1.3	EXPLOSIVES 1.3	172.522
2.3	POISON GAS	172.540
4.3	DANGEROUS WHEN WET	172.548
5.2*	ORGANIC PEROXIDE	172.552
6.1 <sup>a</sup>	POISON INHALATION HAZARD	172.555
7#	RADIOACTIVE	172.556

\*Type B, liquid or solid, temperature controlled.

<sup>a</sup>Packing Group I (Zone A and B, inhalation hazard).

#Radioactive Yellow III label only.

**Table 2**

Category	Placard Name	49 CFR §
1.4	EXPLOSIVES 1.4	172.523
1.5	EXPLOSIVES 1.5	172.524
1.6	EXPLOSIVES 1.6	172.525
2.1	FLAMMABLE GAS	172.532
2.2	NON-FLAMMABLE GAS	172.528
3	FLAMMABLE	172.542
Comb. Liq.	COMBUSTIBLE	172.544
4.1	FLAMMABLE SOLID	172.546
4.2	SPONTANEOUSLY COMBUSTIBLE	172.547
5.1	OXIDIZER	172.550
5.2	ORGANIC PEROXIDE	172.552
6.1 <sup>a</sup>	POISON	172.554
6.1#	KEEP AWAY FROM FOOD	172.553
6.2	(none)	
8	CORROSIVE	172.558
9	CLASS 9	172.560
ORM-D	(none)	

<sup>a</sup>Packing Group I or II (other than Packing Group I inhalation hazard).

#Packing Group III.



Since 1978, the LOSH Program has partnered with unions, employers, labor-management groups, governmental agencies, and health professionals to provide an array of health and safety education and training programs and publications that promote workplace health and safety. Most training and publications are available in English and Spanish.

## **FOUR ways to Register:**

**1) On-line Registration**

**<http://www.losch.ucla.edu>**

**2) By Phone:**

**(310) 794-5964**

**3) By Mail:**

**UCLA-LOSH**

**Hazardous Waste Course Coordinator**

**Box 951478**

**Los Angeles, CA 90095-1478**

**4) By FAX to: (310) 794-6403**

**Hazardous Waste Course Coordinator**

### **COURSE INFORMATION**

- **40 - HR. HAZARDOUS WASTE GENERAL SITE WORKER**
- **SITE WORKER and EMERGENCY RESPONSE REFRESHER**
- **FIRST RESPONDER (AWARENESS & OPERATIONS LEVEL)**
- **HAZARDOUS MATERIALS INDUSTRY TECHNICIAN**
- **HAZARD COMMUNICATION**
- **INCIDENT COMMANDER**
- **SITE SUPERVISOR**
- **CONFINED SPACE**