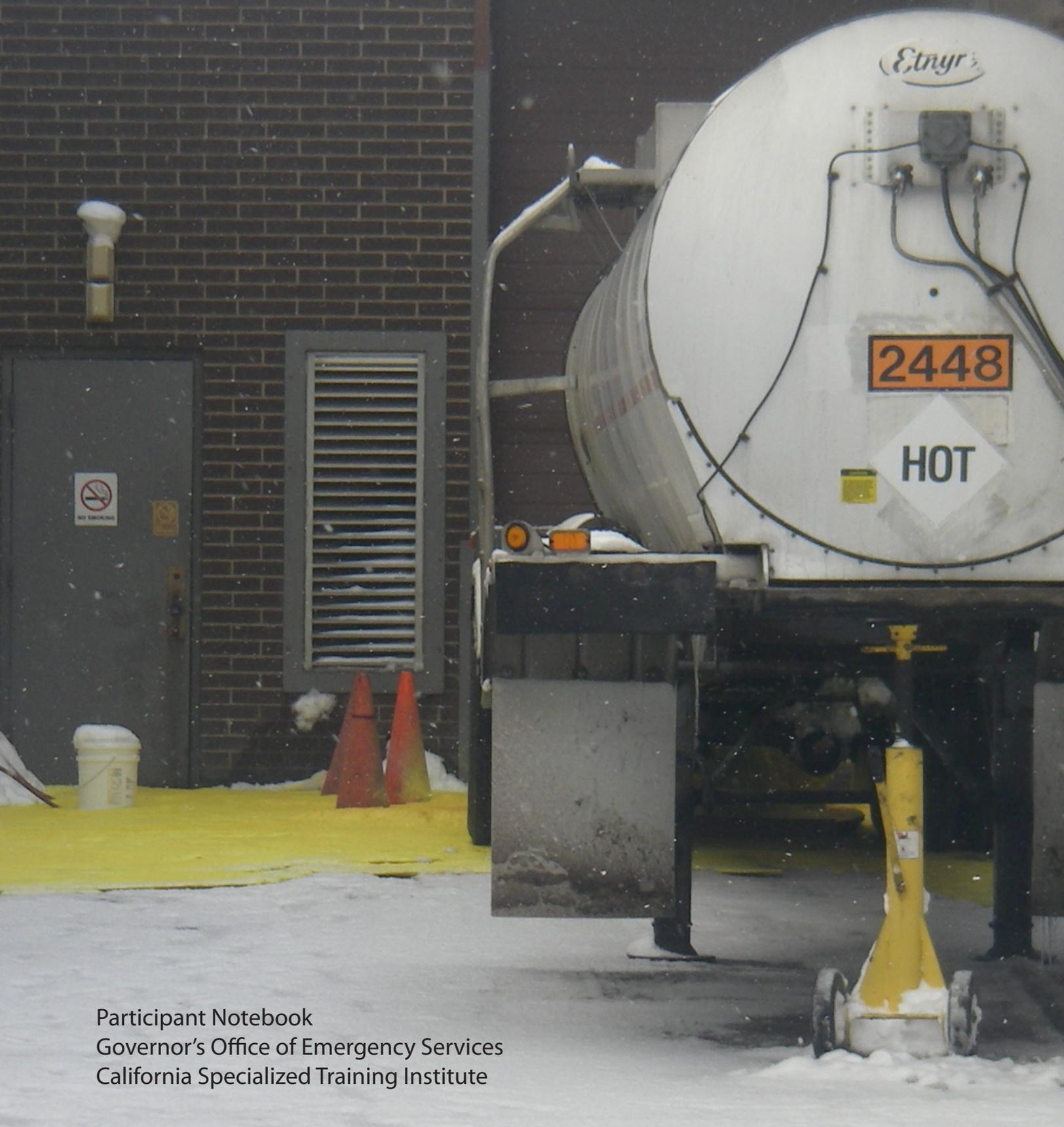


# Hazardous Materials *First Responder Awareness*







## *Hazardous Materials First Responder "Awareness"*

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## Chapter A

### *Welcome and Course Overview*

#### Main Points

- Introductions and Welcome
- Course Overview
- Key Administrative Announcements
- Need for First Responder Training
- “SAFE” Acronym Theme
- Class Groups and Teams

## Chapter Outline

### **1. Introductions and Welcome.**

- a. Course Manager welcome.
- b. Faculty and staff introductions.
- c. Class participant introductions.

### **2. Course Overview.**

- a. Course purpose and goal.
- b. Class schedule.

### **3. Key Administrative Announcements.**

- a. Break and lunch info. (Start on time, finish on time.)
- b. Restroom location(s).
- c. Policy on smoking or eating in classroom.
- d. Emergency telephone number.
- e. Class evaluation sheet.
- f. Certification requirements.

## Course Goal.

*Purpose/Goal:* To train first responders to recognize a hazardous materials incident and implement actions to protect themselves and the public from harm.

## Course Requirements.

*Hours:* 4 Minimum – 8 Recommended

*Exercise:* Participate in an exercise requiring participants to demonstrate safe and proper First Responder Awareness actions; *and*

Demonstrate the proper use of USDOT Emergency Response Guidebook (ERG); *and*

*Exam:* Complete a state certified written examination.

*Performance* Full class attendance at minimum hours, participate in an exercise, *and*

Minimum 70% score on exam required for certification.

#### **4. Need for First Responder Training.**

- a. Primary need: Overall safe and competent response, within the “*Awareness*” level (S.I.N.).
- b. To give responders the ability to:
  - 1) Recognize potential or actual Hazmat incidents.
  - 2) Conduct basic initial identification and assessment.
  - 3) Safely isolate the scene and deny entry.
  - 4) Initiate notifications.
  - 5) Contribute to effective and efficient response.

#### **5. “SAFE” Acronym Theme.**

- a. Safety first, last and always.
- b. Analyze all information per *your* needs.
- c. Focus on First Responder Awareness safety and competence.
- d. Enthusiastic involvement by all.

#### **6. Class Groups and Teams.**

## Chapter B

### *Introduction to Hazardous Materials at the First Responder Awareness Level*

#### Main Points

- The Hazmat Problem
- OSHA Hazwoper Regulation
- OSHA Hazwoper Levels
- Hazmat Definitions, Terms and Acronyms
- DOT Hazmat Classes and Examples.
- Multiple Hazards
- Hazmat Commons and Typicals
- Hazmat Tactical Operations Acronym

# Chapter Outline

## 1. The Hazmat Problem.

- a. Hazardous Materials are made, transported, stored and used in every state, city and town.
  - 1) Standard of living requires Hazmat use and transport.
  - 2) Millions of chemicals in existence, thousands classified as hazardous and hundreds as extremely hazardous.
- b. Major elements of the Hazmat problem include:
  - 1) Volume of hazardous materials.
  - 2) Variety of hazardous materials.
  - 3) Widespread presence of hazardous material, and
  - 4) The human factor.
- c. Because of these elements, “Events” (accidents, emergencies and incidents) *will* happen.
- d. Hazmat Events can have negative outcomes on Life/Health, Environment, and Property — In that order!
- e. Government or industry can not eliminate events, but can:
  - 1) Prepare for events.
  - 2) More effectively and efficiently respond to events.
  - 3) Training helps us do all of the above!
- f. Hazmat events are different from other emergencies:
  - 1) Many hazmats can injure or kill before you see or smell them.
  - 2) Some hazmat events can get suddenly worse (e.g. BLEVEs).
  - 3) Must respond *safely, slowly and methodically*.

## Hazardous Materials Events

- California*
- Over 1,300 transportation-related accidents involving hazardous materials each year.
  - Over 150 chemical manufacturers.
  - Over 144,000 business selling or using chemicals.
  - Over 7000 hazmat/oil spills each year.
  - Over 1,000,000 tons of petroleum products, hazardous materials and hazardous waste shipped each year.

### Fundamental difference in a Hazmat response:

We must respond:

- Safely*
- Slowly*
- Methodically*



Hazmat events cannot be eliminated—***interaction of Hazmats and human beings will create Hazmat events!***

## 2. OSHA Hazwoper Regulation.

- a. **Hazardous Waste Operations and Emergency Response** (Hazwoper). 29 CFR 1910.120(q) (federal regulation) and Title 8 CCR 5192(q) (California regulation).
  - 1) Regulates three activities:
    - a) Hazardous waste site cleanup.
    - b) Operation of treatment, storage and disposal facilities.
    - c) Emergency response to hazmat releases.
  - 2) Requires employers to:
    - a) Plan for response and cleanup.
    - b) Train employees for assigned roles.
    - c) Follow basic response requirements.
- b. Focus of this course is on emergency response.
- c. Hazwoper specifies training for various levels of responders.

## 3. OSHA Hazwoper Levels.

- a. The first people there (i.e. First Responders) are the first line of defense to protect Life, Environment & Property.
- b. Primary First Responder role is to *safely and competently respond within appropriate level, resources and capabilities*.
- c. First Responder at the “Awareness” Level:
  - 1) Definition: One likely to witness/discover a Hazmat release and can initiate notifying authorities and take *no further actions*. [29 CFR 1910.120(q)(6)(i) & 8 CCR 5192(q)(6)(A)]

## OSHA Policy for FRA Training

- General* “Fire fighters and police officers who are expected to be engaged in responding to emergencies involving hazardous substances are subject to the HAZWOPER training requirement.”
- Fire* “Fire fighters expected to respond to releases of hazardous substances must be trained to at least the **first responder operations** level, since they will respond to releases, or potential releases, of hazardous substances for the purpose of protecting nearby persons, property, or the environment.”
- Police* “Generally, police officers should be trained to the **first responder awareness** level, since they are likely to witness or discover a release of a hazardous substance.”
- Vehicle Operators* “The operators of vehicles involved in an emergency response would need to be trained at least to the [FRA] level to recognize an emergency situation, understand their role in an emergency response, and call predesignated authorities for the containment and control of the release.” (e.g. towtrucks)
- Incident Release* “If the employer expects employees to handle incidental releases of hazardous substances...The employer must provide the appropriate training...in compliance with 29 CFR 1910.120(q)(6)(i) first responder awareness level training...”
- Source:* OSHA CPL 02-02-073, Paragraph XI.G.2

### 3. OSHA Hazwoper Levels. (*continued*)

- d. First Responder at the “Operations” Level:
  - 1) Definition: One who responds to a hazmat release to protect nearby persons, environment or property (trained to act in a *defensive* fashion without trying to actually stop the release). [29 CFR 1910.120(q)(6)(ii) & 8 CCR 5192(q)(6)(B)]
  
- e. First Responders at *both* levels have limits:
  - 1) Equipment: Lack adequate protective equipment.
  - 2) Training: Not trained/equipped to **stop** the release.
  
- f. Other Responders levels:
  - 1) Technicians — “...individuals who respond to releases or potential releases of hazardous substances for the purpose of stopping the release. They assume a more aggressive role than a first responder...”
  - 2) Specialists — “...respond with and provide support to [hazmat] technicians...require a more directed or specific knowledge of the various substances...also act as the site liaison with federal, state, local and other government authorities...”
  - 3) Incident Commander (IC) — “will assume control of the incident scene...” (Overall *management* of the incident.)
  - 4) Skilled Support Personnel—“ Personnel...skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work... are not required to meet the training required in this paragraph...”
  - 5) Specialist employees—“Employees who...work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident...”
  
- g. Know your level, role/responsibility **and** limits!

## First Responder Awareness vs. Operations

Awareness	Operations
Likely to witness or discover a release. Initiate an emergency response. Notify the authorities of the release.	Likely to witness or discover a release. Initiate an emergency response. Notify the authorities of the release. Respond to release in defensive fashion. Protect persons, property & environment. Contain the release from a safe distance.

## First Responder vs. Technician/Specialist

First Responder	Tech/Spec
Part of <i>initial</i> response. Respond to release in <i>defensive</i> fashion. Contain the release from a safe distance.	Implement emergency response plan. Assume a more aggressive role. Control or stop the release.

#### 4. Hazmat Definitions, Terms and Acronyms.

- a. No one universal term or definition.
  - 1) In the workplace: **hazardous chemical** (OSHA).
  - 2) When transported: **hazardous material** (DOT).
  - 3) If it's otherwise regulated: **hazardous substance** (EPA).
  - 4) When you can't use it anymore: **hazardous waste** (EPA).
  - 5) See facing page for definitions.
  
- b. Other hazmat terms.
  - 1) **Extremely hazardous substance** (EPA): Stricter reporting requirements than other hazmats.
  - 2) **Highly hazardous chemical** (OSHA): Regulated by Process Safety Management regulations.
  - 3) **Toxic chemical** (EPA): Annual reporting required for releases.
  
- c. Different laws, different definitions.
  - 1) Laws/regs passed at different times for different purposes.
  - 2) Some (definitions and laws) may overlap.
  - 3) For FRAs, "hazardous" means what it says.
  
- d. Hazmat terms and acronyms.
  - 1) There are a lot.
  - 2) Some may be confusing.
  - 3) Don't be afraid to ask (See Annex).
  
- e. Classification of hazardous materials.
  - 1) UN and USDOT classification system.
  - 2) Uses 9 hazard classes.
  - 3) Used worldwide (and in this course!).

## What are hazardous materials?

*Definitions:*        **There is no one definition!** Here are the important ones.

*OSHA*                **Hazardous Chemical:** Any substance to which exposure “results or may result in adverse affects on the health or safety of employees:” or “any chemical which is a physical hazard or a health hazard.” 29 CFR 1910.1200(c)

*EPA*                 **Hazardous Substance:** “Any substance designated pursuant to section 311(b)(2)(A) of the CWA [Clean Water Act]; any element, compound, mixture, solution or substance designated pursuant to section 102 of CERCLA; any hazardous waste having the characteristics identified under or listed pursuant to section 301 of the Solid Waste Disposal Act... any toxic pollutant listed under section 307(a) of the CWA; any hazardous air pollutant listed under section 112 of the clean Air Act; and any imminently hazardous chemical substance or mixture with respect to which the EPA Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act.” 40 CFR 300.5

*DOT*                **Hazardous Material:** “...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 includes hazardous substances, hazardous wastes, marine pollutants, and elevated temperature materials as defined in this section...” 49 CFR 171.8

## 5. DOT Hazmat Classes and Examples.

- a. USDOT Hazmat classes and divisions.
  - 1) Explosives (Class 1) — Trinitrotoluene (TNT).
    - 1.1 Mass explosion hazard.
    - 1.2 Projection hazard.
    - 1.3 Predominately a fire hazard.
    - 1.4 No significant blast hazard.
    - 1.5 Very insensitive explosives or blasting agents.
    - 1.6 Extremely insensitive detonating substances.
  - 2) Gases (Flammable or Poisonous) (Class 2) — Ammonia.
    - 2.1 Flammable gas.
    - 2.2 Non-flammable compressed gas.
    - 2.3 Poisonous gas.
  - 3) Flammable and Combustible Liquids (Class 3) — Gasoline.
  - 4) Flammable Solids (Class 4) — Naphthalene.
    - 4.1 Flammable solid.
    - 4.2 Spontaneously combustible.
    - 4.3 Dangerous when wet.
  - 5) Oxidizers and Organic Peroxides (Class 5) — Calcium Nitrate.
    - 5.1 Oxidizer.
    - 5.2 Organic peroxide.
  - 6) Poisonous and Infectious Materials (Class 6) — Acrolein.
    - 6.1 Poisonous.
    - 6.2 Infectious substance (etiologic agent).
  - 7) Radioactive Materials (Class 7) — Uranium Hexafluoride.
  - 8) Corrosive Materials (Class 8) — Sulfuric Acid.
  - 9) Misc. Hazardous Materials (Class 9) — Asbestos.

## Definitions of DOT Hazard Classes.

- 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 LC50 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 microcuries 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. Does not meet the definition of any other class.

## 6. Multiple Hazards.

- a. DOT regulations are performance standards—a material is “hazardous” because it meets the DOT definition. Not all materials neatly fall into those definitions. It’s possible for a substance to meet the definition of more than one hazard class.
- b. Substances that meet the definition of more than one hazard class are classified according to the highest applicable hazard class (49 CFR 173.2a) and are placarded accordingly.
- c. Shipping papers and placards may not indicate all subsidiary or multiple hazards. A material may not be classified as “hazardous” by these regulations but still, under certain circumstances, be hazardous (e.g. ammonia and flammability).
- d. *Responders should always think of multiple hazards regardless of how a substance is placarded or labeled!*

## 7. Hazmat Commons and Typical.

- a. Commons:
  - 1) Common release: Petroleum products (diesel or gasoline).
  - 2) Common release locations: Fixed facilities (in over 25% of the incidents the surrounding area was *residential*).
  - 3) Common release factor: Equipment failure.
- b. Typical:
  - 1) Typical responder exposure: *Inhalation*.
  - 2) Typical number of response agencies: *Four*.
  - 3) Typical first responder: *You!*

## Multiple Hazards.

49 CFR 171.8 A material may meet the defining criteria for more than one hazard class but is assigned to only one hazard class.

49 CFR 172.505 Hazardous materials that possess secondary hazards *may* exhibit subsidiary placards.

### Examples

<b>Material</b>	<b>Primary Hazard</b>	<b>Subsidiary Hazard(s)</b>
<i>Acrolein</i> .....	Poisonous .....	Flammable
<i>Bromine</i> .....	Corrosive .....	Poisonous
<i>Chlorine</i> .....	Poisonous .....	Corrosive
<i>Denatured Alcohol</i> .....	Flammable.....	Poisonous
<i>Hydrazine, anhydrous</i> .....	Corrosive .....	Flammable, Poisonous
<i>Hydrofluoric Acid</i> .....	Corrosive .....	Poisonous
<i>Methanol</i> .....	Flammable.....	Poisonous
<i>Nitric Acid, red fuming</i> .....	Corrosive .....	Oxidizer, Poisonous
<i>Phosphorous, white</i> .....	Spontaneously Combustible....	Poisonous
<i>Sulfur Dioxide</i> .....	Poisonous .....	Corrosive
<i>Uranium Hexafluoride</i> .....	Radioactive.....	Corrosive

## Commons and Typicals

The most commonly released hazardous substance in my location is:

\_\_\_\_\_

The most commonly shipped or manufactured hazardous substance in my location is:

\_\_\_\_\_

The most common release location where I live/work is:

\_\_\_\_\_

## 8. Hazmat Tactical Operations Acronym.

- a. Safety.
- b. Isolate and deny entry.
- c. Notifications.
- d. Command.
- e. Identification and hazard assessment.
- f. Action planning.
- g. Protective equipment.
- h. Countermeasures.
- i. Protective actions.
- j. Decontamination.
- k. Disposal.
- l. Documentation.
- m. Use it or, *develop your own acronym/checklist/memory jogger!*

## Hazmat Tactical Operations/Priorities Acronym.

<b>S</b>	<i>Safety</i>
<b>I</b>	<i>Isolate and Deny Entry</i>
<b>N</b>	<i>Notifications</i>
<b>C</b>	<i>Command/Management</i>
<b>I</b>	<i>Identification and Hazard Assessment</i>
<b>A</b>	<i>Action Planning</i>
<b>P</b>	<i>Protective Equipment</i>
<b>C</b>	<i>Containment and Control</i>
<b>P</b>	<i>Protective Actions</i>
<b>D</b>	<i>Decontamination and Cleanup</i>
<b>D</b>	<i>Disposal</i>
<b>D</b>	<i>Documentation</i>

## First Responder Awareness.

### 29 CFR 1910.120(q)(6)(i), Title 8 CCR 5192(q)(6)(A)

<i>General</i>	“(6) Training. ... based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders...shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with the following paragraphs:”
<i>FRA</i>	“(i) First responder awareness level. ...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 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:”
<i>Competencies</i>	“(A) An understanding of what hazardous substances are, and the risks associated with them in an incident. (B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present. (C) The ability to recognize the presence of hazardous substances... (D) The ability to identify the hazardous substances, if possible. (E) 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 [ERG]. (F) The ability to realize the need for additional resources, and to make appropriate notifications...”
<i>Minimum hours</i>	None specified.

## First Responder Operations.

### 29 CFR 1910.120(q)(6)(ii), Title 8 CCR 5192(q)(6)(B)

*FRO* “(ii) First responder operations level. ...individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:”

*Competencies* “(A) Knowledge of the basic hazard and risk assessment techniques.  
(B) Know how to select and use proper personal protective equipment provided to the first responder operational level.  
(C) An understanding of basic hazardous materials terms.  
(D) Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.  
(E) Know how to implement basic decontamination procedures.  
(F) An understanding of the relevant standard operating procedures and termination procedures.”

*Minimum hours* 8 hours.

## DOT Classifications of Hazardous Materials

Class #	Division #	Name of Class or Division	49 CFR §
1	1.1	Explosives (with mass explosion hazard)	173.50
1	1.2	Explosives (with projection hazard)	173.50
1	1.3	Explosives (with predominately a fire hazard)	173.50
1	1.4	Explosives (with no significant blast hazard)	173.50
1	1.5	Very insensitive explosives; blasting agents	173.50
1	1.6	Extremely insensitive detonating substances	173.50
2	2.1	Flammable gas	173.115
2	2.2	Non-flammable compressed gas	173.115
2	2.3	Poisonous gas	173.115
3		Flammable and combustible liquid	173.120
4	4.1	Flammable solid	173.124
4	4.2	Spontaneously combustible material	173.124
4	4.3	Dangerous when wet material	173.124
5	5.1	Oxidizer	173.128
5	5.2	Organic peroxide	173.128
6	6.1	Poisonous materials	173.132
6	6.2	Infectious substance (Etiologic agent)	173.134
7		Radioactive material	173.403
8		Corrosive material	173.136
9		Miscellaneous hazardous material	173.140
None		Other regulated material: ORM-D	173.144

## Definitions of DOT Hazard Classes

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 microcuries 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>

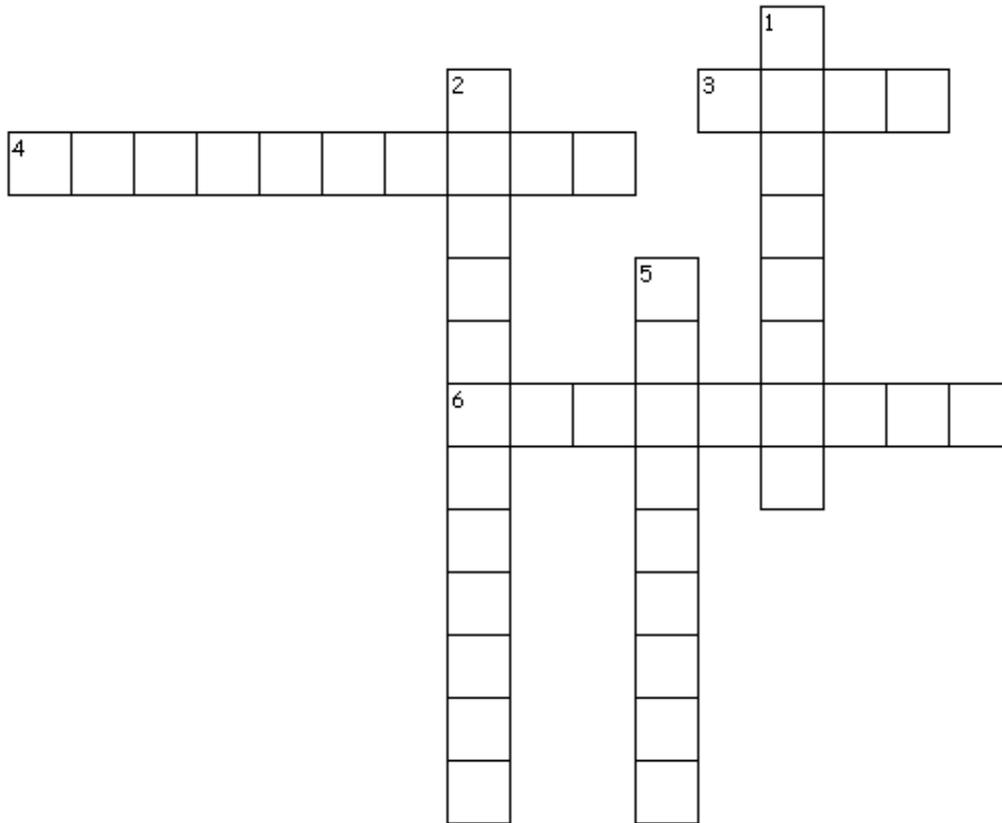
## Acronyms and Abbreviations

AB	Assembly Bill
ACGIH	American Conference of Governmental Industrial Hygienists
AFFF	Aqueous Film Forming Foam
AIHA	American Industrial Hygiene Association
ALARA	As Low as Reasonably Achievable
ANSI	American National Standards Institute
APR	Air Purifying Respirator
ATSDR	Agency for Toxic Substances and Disease Registry
AQMD	Air Quality Management District
BLEVE	Boiling Liquid Expanding Vapor Explosion
CAA	Clean Air Act (1980)
CAC	California Administrative Code
CAER	Community Awareness/Emergency Response Program
CAL-OSHA	California Occupational Safety and Health Administration
CAMEO	Computer-Aided Management of Emergency Operations
CAS	Chemical Abstracts Service
CCR	California Code of Regulations
CDF	California Department of Forestry
CEEL	Community Emergency Exposure Level
CEO	Chief Executive Officer
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (1981)
CFIRS	California Fire Information Response System
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CGC	California Government Code
CHEMTREC	Chemical Transportation Emergency Center
CHLOREP	Chlorine Emergency Program
CHP	California Highway Patrol
CHRIS	Chemical Hazards Response Information System
CIH	Certified Industrial Hygienist
CMA	Chemical Manufacturer's Association
CP	Command Post
CPC	Chemical Protective Clothing
CRWQCB	California Regional Water Quality Control Board
CUPA	Certified Unified Program Agency
CVC	California Vehicle Code
CWA	Clean Water Act (1972) = FWPCA
DFW	California Department of Fish and Wildlife
DOT	Department of Transportation
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
FAA	Federal Aviation Administration
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
FWPCA	Federal Water Pollution Control Act (1972) = CWA
HAZ CAT	Hazard Categorization
HAZMAT	Hazardous Material
HEPA	High Efficiency Particulate Air filter
HHS	U. S. Department of Health and Human Services
HMTA	Hazardous Materials Transportation Act
IC	Incident Commander
ICS	Incident Command System
ICP	Incident Command Post
IDHA	Identification and Hazard Assessment
IDLH	Immediately Dangerous to Life or Health
IMO	International Maritime Organization
LC <sub>LO</sub>	Lethal Concentration, low
LC <sub>50</sub>	Lethal Concentration, 50%
LD <sub>50</sub>	Lethal Dosage, 50%
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Committee
MSHA	Mine Safety and Health Administration
NBC	Nuclear, Biological & Chemical
NCP	National Contingency Plan
NCRIC	National Chemical Response and Information Center
NEPA	National Environmental Policy Act (1970)
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
NPR	Notice of Proposed Rulemaking
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 Spill Prevention and Response (DF&W)
PCB	Polychlorinated Biphenyls
PEAC	Palmtop Emergency Action for Chemicals
PEL	Permissible Exposure Limit
PIO	Public Information Officer
PPB	Parts Per Billion
PPE	Personal Protective Equipment
PPM	Parts Per Million
RCRA	Resource Conservation and Recovery Act (1976)
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

SDS	Safety Data Sheet
SDWA	Safe Drinking Water Act (1974)
SEMS	Standardized Emergency Management System
SERC	State Emergency Response Commission
SINCIAPCPDDD	Safety, Isolation & Deny Entry, Notifications, Command/Management, Identification & Hazard Assessment, Action Planning, Protective Equipment, Containment & Control, Protective Actions, Decontamination & Cleanup, Disposal, and Documentation
SLC	State Lands Commission
STEL	Short Term Exposure Limit
SWRCB	State Water Resources Control Board
TLV	Threshold Limit Value
TOMES	Toxicology, Occupational Medicine & Environmental Series Database
TSCA	Toxic Substances Control Act (1976)
TSCD	Toxic Substances Control Division
TSDF	Treatment, Storage and Disposal Facility
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriter's Laboratories
USA	Underground Services Alert
USCG	U. S. Coast Guard
USDOT	U. S. Department of Transportation
USEPA	U. S. Environmental Protection Agency (EPA)
USGS	U. S. Geological Survey
USFWS	U. S. Fish and Wildlife Service
USNRC	U. S. Nuclear Regulatory Commission
UV	Ultraviolet radiation
WMD	Weapons of Mass Destruction
VOC	Volatile Organic Compound
Z list	The OSHA table of Permissible Exposure Limits, so named because the tables are identified as Z-1, Z-2, and Z-3, and because they are found in "Subpart Z - Toxic and Hazardous Substances" of the OSHA regulations. This subpart contains 29 CFR 1910.1000 through 29 CFR 1910.1500.

# Module Review – Crossword Puzzle



**Across**

- 3. # of DOT Hazard Classes
- 4. Person who stops the release
- 6. Level that Witnesses or Discovers Release

**Down**

- 1. # of Chemicals Existing
- 2. Tactical Acronym
- 5. Hazard Class Eight



## Chapter C

### *Hazardous Materials Recognition and Safety*

#### Main Points

- Recognizing Hazmat Incidents
- Hazmat Recognition Clues
- Hazmat Outward Warning Signs
- Hazmat Locations and Occupancies
- Hazmat Containers and Packages
- US DOT Placards and Labels
- Special Markings
- Global Harmonization System (GHS)
- Shipping Papers and SDSs
- First Operational Thought

## Chapter Outline

### 1. Recognizing Hazmat Incidents.

- a. *Any responder* can encounter hazardous materials. According to an ongoing federal government study (ATSDR HSEES 2009), of the injuries to responders in Hazmat incidents:
  - 1) 31% are law enforcement personnel.
  - 2) 58% are firefighters (career and volunteer).
  - 3) 11% are other responders (includes in-house response teams).
  
- b. If you don't know it's there you can't protect yourself.
  - 1) Recognition leads to safety,
  - 2) Safety leads to lives preserved!
  
- c. ***Initial reports may not indicate the presence of hazardous materials! May be reported as:***
  - 1) Traffic accident,
  - 2) Medical aid,
  - 3) Fire,
  - 4) Person down.
  - 5) Or, \_\_\_\_\_

## Hazmat Recognition.

Hazmat events may first be reported as:

*Traffic accident,*



*Medical aid call,*



*Fire,*



*Investigation, etc.*

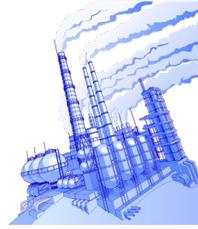


## 2. Basic Hazmat Recognition Clues.

- a. Occupancy/Location (e.g. Plating shop or refinery).
  - 1) Occupancy/Location: who's there and what they are making, selling, storing, transporting, etc.
  - 2) Hazmats manufactured/stored/used/transported anywhere but be aware of common locations.
- b. Container Shapes (e.g. compressed gas cylinder).
- c. Markings & Colors (e.g. package label).
- d. Placards & Labels (e.g. orange placard = Explosive).
- e. Shipping Papers and SDS (e.g. Consist for railroad incident).
- f. Senses (e.g. Sight, hearing and smell - *last resort*).
- g. Other Clues (e.g. Responsible party, witness, business plan, etc.).
- h. "Clues" are *clues*, not absolutes! They are...
  - 1) A warning,
  - 2) A note of caution,
  - 3) An indication of things to come,
  - 4) *But not always all the answers you need.*

## Basic Hazmat Recognition Clues:

*Occupancy/Location*



*Container Shapes*



*Markings & Colors*



*Placards & Labels*



*Shipping Papers & SDS*



*Senses*



### 3. Hazmat Outward Warning Signs.

a. General examples:

- 1) People running from, or collapsed in the area,
- 2) Evidence of leak (fire, smoke, visible vapors, unusual colors/odors, sheen on water),

*“Clouds are bad. Clouds with color are worse.”*

Michael Callan, *Street Smart Hazmat Response*

- 3) Activated pressure relief valve.
- 4) Evidence of recent fumigation (e.g tented building).
- 5) Dead animals/insects or discolored vegetation.
- 6) People in the area reporting symptoms of exposure.
- 7) Damaged/deteriorated container.
- 8) Discolored containers, valves, piping or containment.
- 9) Something just doesn't look right...

b. Industrial facilities examples:

- 1) Alarm from installed monitoring system.
- 2) Activation of emergency decon shower.
- 3) Change in paint color on piping or storage system.
- 4) Signs warning of unspecified hazards.
- 5) Presence of unknown liquid within containment system.
- 6) Something just doesn't look right...

c. Remember: *If you see any warning sign then assume hazardous materials are there* and look for other clues or warning signs until you confirm the absence of hazardous materials!

## Excerpts from Recognition Case Studies

“On June 13, 1992, the two boys, who had been playing in the company’s trash dumpster, were overcome by — and later died as a result of inhaling — fumes from toluene...”

“...a department store employee...was ordered to dispose of some outdated Ortho products in a waste oil drum in the back of the store. The employee was caught in the act by the Fire Lt. after Fire/EMS was called to an adjacent store by a sick clerk complaining of a strong offensive odor.”

“My partner and I responded to a burglary in progress at a house that was being tented for termites. ...A few minutes later here comes Dumbcrook out from underneath the tent. We move in on him and the chase was on. We finally catch up to him, and the fight is on. We get him into custody and see this guy isn’t doing too well so we call the paramedics (No, not from being taken into custody...). As the paramedics arrive we start to have difficulty breathing.”

“Our engine company (3 man fire engine) arrived on scene at the local high school for an apparent poisoning. The male student ingested Lannate pesticide (quarter pound mixed in water). The student was unconscious with vital signs dropping rapidly. The powder was airborne and floating freely with movement of the patient and wind. The captain started to cough and nearly vomited.”

“I treated a 28 year old for trouble breathing after she was trying to clean her house. She was using a ‘flea’ powder to help control fleas in her home from the family dog... As it turned out, her husband got an industrial strength pesticide...”

#### **4. Hazmat Locations and Occupancies.**

- a. Obvious locations.
  - 1) Petroleum refinery (flammable liquids).
  - 2) Welding supply business (compressed gases).
  - 3) Garden supply business (pesticides).
  - 4) Auto parts store (flammable liquids).
- b. Not so obvious locations.
  - 1) Swimming pool supply business (acids and chlorine).
  - 2) Hardware store (flammable liquids).
  - 3) Refrigerated warehouse (anhydrous ammonia).
  - 4) Soft drink distributor (compressed gases).

#### **5. Hazmat Containers and Packages.**

- a. Physical properties of cargo often determine shape of container and material it's made of.
- b. Shape of container/package and material it's made of can provide clues about the contents. They are made the way they are for a reason.
- c. DOT specification containers for motor vehicle transportation.
  - 1) DOT 406/MC 306.
  - 2) DOT 407/MC 307.
  - 3) DOT 412/MC 312.
  - 4) MC 331.
  - 5) MC 338.

(Note: See facing page for information about cargos each type carries. See the pages in the last part of this chapter or the DOT ERG for diagrams of each trailer.)

## DOT Specification Vehicles

- 406/306      Elliptical cross section. Usually carries petroleum products such as gasoline and diesel fuel. Usually made of aluminum (it will melt if the cargo catches fire so the tank won't explode). 49 CFR 178.346.
- 407/307      Horseshoe-shaped cross section due to external insulation around the circular tank. Outer covering is usually aluminum. Designed to hold liquids with low vapor pressures. 49 CFR 178.347
- 412/312      Circular cross section with external "ribs" for added strength. Usually carries corrosives but may be used to carry petroleum products. 49 CFR 178.348.
- 331            Circular cross section with spherical ends. Designed to carry compressed gases. Usually made of steel. 49 CFR 178.337.
- 338            Cylindrical shape. Covered with external insulation. Designed to carry cryogenic materials (i.e. liquefied gases).

## 5. Hazmat Containers and Packages. *(continued)*

- d. Radiological containers.
  - 1) Excepted. (Designed to survive normal conditions of transport.)
  - 2) Industrial. (Designed to survive normal conditions of transport and at least the Drop test and Stacking test for Type A containers.)
  - 3) Type A. (Designed to survive normal transportation, handling, and minor accidents.)
  - 4) Type B. (Designed to survive severe accidents.)
  - 5) Type C. (Designed to contain high-activity materials transported in aircraft. Not allowed for domestic shipments.)
  
- e. Other types of containers.
  - 1) Carboys. (Rigid container often made of plastic or glass. Used to hold liquids. Often used in laboratories. 5-15 gallons capacity.)
  - 2) Dewar flasks. (Glass or metal bottle, with a double-layer construction; two thin-walled bottles nested one inside the other and sealed together at the neck. The narrow space between is evacuated almost entirely of air. Commonly used to carry cryogenic gases such as liquid nitrogen.)
  - 3) Intermediate bulk containers. (Container used to transport and store fluids and bulk materials. Usually cube-shaped with rigid frame. Designed to be stackable and moveable with a forklift. Flexible IBCs commonly called totes.)
  - 4) Marine portable tanks. (Tank designed to be carried on a vessel without being permanently attached to the vessel. Capacity is 110 gallons or more. Usually carry liquids.)
  - 5) Compressed gas cylinders. (Used to store gases above atmospheric pressure. Store a variety of DOT hazard classes. If used in transportation they must comply with DOT regulations. *No standard for color-coding. Can't rely on color of cylinder to identify contents.*)

## Radiological Material Containers

- Excepted*      Designed to survive normal conditions of transport. Used for transportation of materials that are either Low Specific Activity (LSA) or Surface Contaminated Objects (SCO) and that are limited quantity shipments, instruments or articles, articles manufactured from natural or depleted uranium or natural thorium; empty packagings are also excepted.
- Industrial*      Designed to survive normal conditions of transport and at least the DROP test and stacking test for Type A packagings. Industrial packagings (IP) are used for transportation of materials with very small amounts of radioactivity that are either Low Specific Activity (LSA) or Surface Contaminated Objects (SCO).
- Type “A”*      Container used to transport low-level radioactive material. Used to transport limited quantities of radioactive material that would not result in significant health effects if they were released. They are often steel drums, thick plastic containers or steel boxes.
- Type “B”*      Large, heavy metal cask used to transport large quantities of radioactive material with a high level of activity. A Type B package may be a metal drum or a huge, massive shielded transport container. Must meet severe accident performance standards that are considerably more rigorous than those required for Type A packages.
- Type “C”*      Used for high-activity packages transported by aircraft. Meets same performance standards as Type B packages as well as a puncture/tearing test; an enhanced thermal and drop test, and a 200 meter water immersion test.

*Details found in 49 CFR 173 and 10 CFR 71.*

## 5. Hazmat Containers and Packages. *(cont.)*

- f. Above-ground storage tanks.
  - 1) Cryogenic liquid tank.
    - a) Used to store liquefied gases.
    - b) Thick external insulation gives them a distinctive appearance.
    - c) Internal pressure can be over 300 psi.
  - 2) Non-pressure tank. (May have some internal pressure due to evaporation of product.)
    - a) Horizontal. (Usually have flat ends.)
    - b) Vertical. (Will have either open or covered roofs. Open-top tanks normally have floating roofs as do many covered tanks.)
  - 3) Pressure tank.
    - a) High pressure: May be “bullet” shaped or spherical.
    - b) Low pressure: Vertical dome roof tanks. (Usually have less than 15 psi internal pressure.)
    - c) Often painted white or silver to reflect solar heat.
  - 4) Above-ground storage tanks will normally have easily recognizable secondary containment. (e.g. Dikes, containment curbs, and pits.)

*Note: Above-ground tanks may be partially or, in some circumstances, almost completely covered with earth, sand, gravel, asphalt, or other material.*

## Above-Ground Storage Tanks

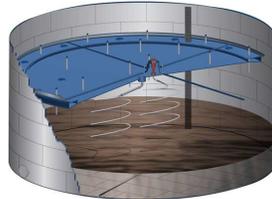
*Cone Roof Tank*



*Cryogenic Tank*



*Floating Roof Tank*



*Horizontal Pressurized Tank*



*Spherical Pressurized Tank*



## 5. Hazmat Containers and Packages. *(cont.)*

- g. Railcars.
  - 1) Cryogenic liquid car.
    - a) Used to transport liquefied gases.
    - b) Fittings are on end of car rather than on top.
  - 2) General service car (low or non-pressure). (May have some internal pressure due to evaporation of product.)
    - a) Car shape similar to pressure car. (Rounded ends.)
    - b) Tank fittings on top of car.
    - c) Fittings normally lack protective housing.
    - d) May have multiple cargo compartments.
  - 3) Pressure car.
    - a) Car shape similar to non-pressure car. (Rounded ends.)
    - b) Tank fittings on top of car.
    - c) Fittings normally in protective housing.
    - d) May be thermally protected (insulation, jacket and/or white paint).
    - e) Non-compartmentalized.
  - 4) Container-stack car.
    - a) Carries standard intermodal containers.
    - b) Containers often stacked two high.
    - c) Carries all standard sized containers.
    - d) Containers can carry a wide variety of hazmats.
    - e) Also called “container on flatcar” or COFC.

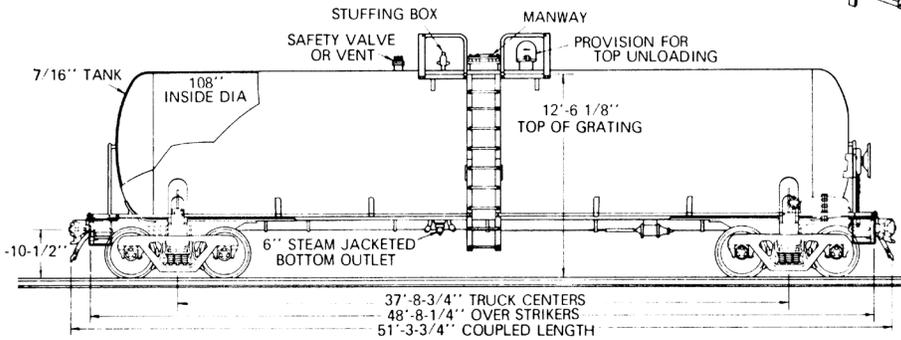
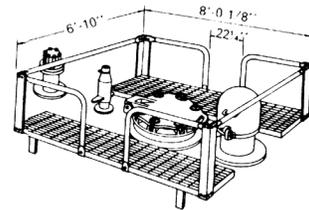
# Rail Tank Car Recognition

Rail tank cars may have visual clues that will help you distinguish between pressure and non-pressure tank cars. Non-pressure tank cars may have visible fittings and/or one or more expansion domes. Pressure tanks cars typically have all fittings out of sight under a single protective housing on top of the tank (although some non-pressure tank cars may also have this protective housing).

## Non-Pressure Car

20,000 GALLON CAPACITY - NON INSULATED  
 DOT - 111A100W1  
 FOR GENERAL SERVICE COMMODITIES  
 4" SLOPE TO STRAIGHT CENTER SECTION.

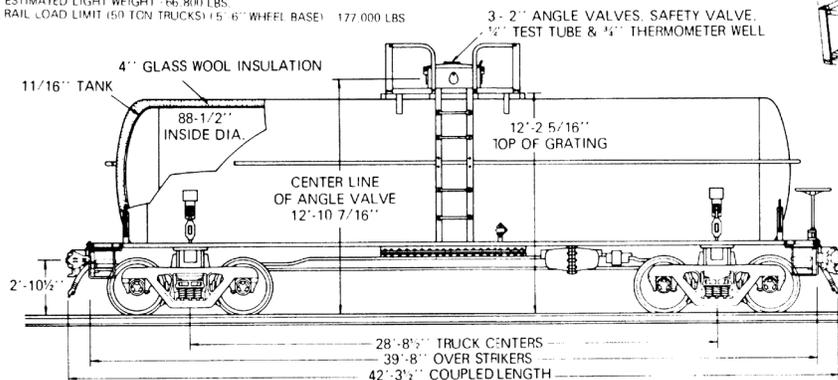
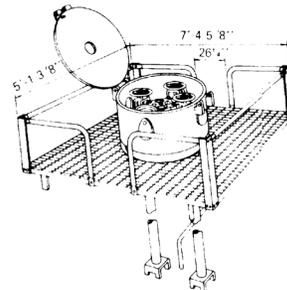
NOMINAL CAPACITY @ 2% OUTGAGE - 20,000 GALS.  
 ESTIMATED LT. WT. (NON COILED) - 57,800 LBS.  
 RAIL LOAD LIMIT (100 TON TRUCKS) - 263,000 LBS.



## Pressure Car

11,000 GALLON CAPACITY - INSULATED  
 DOT - 105A300W  
 FOR LIQUEFIED PETROLEUM GAS & ANHYDROUS AMMONIA SERVICE

NOMINAL CAPACITY @ 95.2% FILLING DENSITY - 11,000 GALS  
 ESTIMATED LIGHT WEIGHT - 66,800 LBS.  
 RAIL LOAD LIMIT (50 TON TRUCKS) (5' 6" WHEEL BASE) - 177,000 LBS.

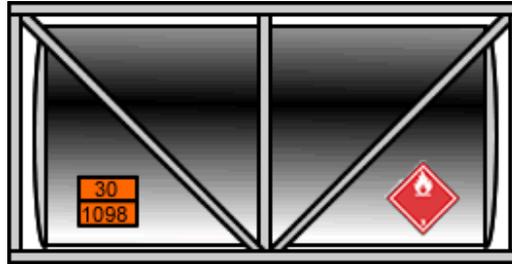


## 5. Hazmat Containers and Packages. *(cont.)*

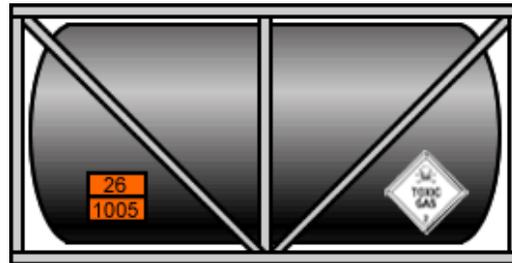
- h. Intermodal containers.
  - 1) Called “intermodal” because they can be transported on multiple modes of transportation.
  - 2) Non-pressure. (Variety of shapes, types and sizes. General types: Box containers, Closed top, open top and refrigerated.)
  - 3) Low pressure.
    - a) IM-101. (Can have working pressure up to 100 psi. Can carry solids and low vapor pressure liquids from a variety of hazard classes as well as non-hazardous cargoes.)
    - b) IM-102. (Can have working pressure up to 25 psi. Can carry solids and low vapor pressure liquids from a variety of hazard classes as well as non-hazardous cargoes.)
  - 4) Specialized.
    - a) IMO Type 7. (Cryogenic liquid tank.)
    - b) Tube modules. (Multiple high pressure cylinders. 3000-5000 psi. Carries gases such as oxygen, nitrogen, helium, and hydrogen,)
    - c) DOT Specification 51/IMO Type 5 (Pressurized tank, 100-500 psi. Carries LPG, anhydrous ammonia and other high vapor pressure liquids.)
  - 5) Sizes. (Most are 20 or 40 feet long, 8 feet wide and 8.5 feet high. Many are 53 feet long.)
- i. Others.
  - 1) Bags. (Made from variety of materials.)
  - 2) Drums. (Made from metal, plastic or fiberboard.)
  - 3) Dry bulk railcar/trailer. (Carries pellets, powders or pills (small dry spheres. Can carry oxidizers or corrosives.)
  - 4) Bottles. (Are often enclosed in boxes.)

## Intermodal Containers

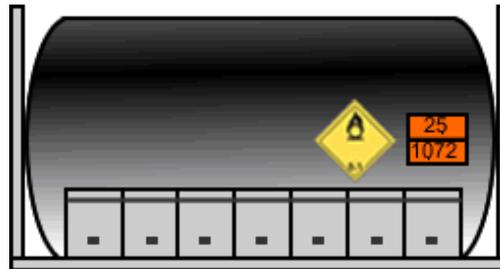
*IM-101/102*



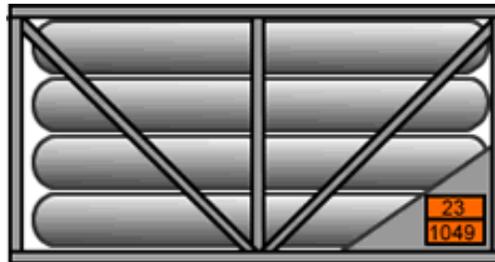
*DOT Spec 51*



*IMO Type 7*



*Tube Module*



## 6. USDOT Hazmat Placards and Labels.

- a. Purpose of system.
  - 1) Provide initial warning information in the event of an incident involving a shipment of hazardous materials.
  - 2) Warn responders, handlers, and bystanders that hazards are present and reduce the chance of someone inadvertently entering a hazmat incident site.
- b. General marking requirements for transport vehicles or freight containers.
  - 1) Must be marked with the identification number and the applicable placard (ID number may be on an orange panel or on the placard).
  - 2) Markings must be on each side and each end.
- c. Placards.
  - 1) Displayed on a shipping vehicle (e.g. trailer, railcar, shipping container, bulk package, etc.).
  - 2) Diamond shaped, at least 10.8 inches on each side.
  - 3) Background color, symbol and digit at the bottom of the placard correspond to the hazard class.
- d. Labels.
  - 1) Displayed on “packages or containment devices” (e.g. bag, drum, box, bottle, compressed gas cylinder, etc.).
  - 2) Diamond shaped, at least 3.9 inches on each side.
  - 3) Background color, symbol and digit at the bottom of the label correspond to the hazard class.

## Placarding Requirements (49 CFR 172.504)

### *Display*

Must placard each bulk packaging, freight container, unit load device, transport vehicle or rail car on each side and each end. Required on two opposite sides of portable tanks (less than 1000 gallons capacity).



### *“Dangerous”*

May use a “Dangerous” placard 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, that require different placards specified in Table 2. However, 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.

### *Exception*

Regulations allow some shipments of hazardous materials (e.g. consumer commodities in small packages) of less than 1,001 lbs aggregate gross weight to be shipped without *any* placards.

### *Subsidiary Hazards*

The regulations *require* some hazardous materials to include placards for subsidiary hazards and *allows* the use of multiple 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.

## 6. USDOT Hazmat Placards and Labels. (cont.)

### e. Hazmat Placard colors/symbols and examples:

- 1) Explosives — Trinitrotoluene.
  - a) Division 1.1-1.3 (Orange/Bursting Ball)
  - b) Division 1.4-1.6 (Orange/Division Number)
- 2) Gases.
  - a) Division 2.1 (Red/ Flame) — Propane.
  - b) Division 2.2 (Green/Cylinder) — Carbon Dioxide.
  - c) Division 2.3 (White/ Skull & Crossbones) — Chlorine.
- 3) Flammable Liquids (Red/Flame) — Gasoline.
- 4) Flammable Solids.
  - a) Division 4.1 (Red & White Stripes/Flame) — Fusee.
  - b) Division 4.2 (White over Red/Flame) — White Phosphorus.
  - c) Division 4.3 (Blue/Flame) — Calcium Carbide.
- 5) Oxidizers.
  - a) Division 5.1 (Yellow/Flaming “O”) — Hydrogen Peroxide.
  - b) Division 5.2 (Red over Yellow/Flame) — MEKP.
- 6) Poisons/Toxics.
  - a) Division 6.1 (White/Skull & Crossbones)— Arsenic.
  - b) Division 6.2 (No Placard) — Infectious Substances.
- 7) Radioactives (Yellow over White/Trefoil) — Thorium.
- 8) Corrosives (White over Black/Test Tube) — Sulfuric Acid.
- 9) Miscellaneous Hazardous Materials (White & black vertical stripes over solid white/no symbol): Asbestos.

### f. Specialized placards.

- 1) “Dangerous” placard.
  - a) Used for mixed loads of Table 2 commodities.
- 2) “Oxygen” placard.
- 3) “Inhalation Hazard” placard.
  - a) Used for both Hazard Classes 2 and 6.

## 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.

## DOT Placarding Tables (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.

## 6. USDOT Hazmat Placards and Labels. (*cont.*)

- g. Placard limits.
  - 1) Multiple and subsidiary hazards.
  - 2) “Dangerous” placard meaning (Table 1 & 2 commodities).
  - 3) Compliance and enforcement.
- h. When placards are required.
  - 1) Bulk shipments.
  - 2) Table 1 commodities (in any amount).
  - 3) Table 2 commodities (more than 1001 lbs aggregate gross weight loaded at one facility).
- i. Placards versus labels.
  - 1) Placards – affixed to shipping containers. (Railcar, trailer, intermodal container, etc.)
  - 2) Labels – affixed to shipping packages. (drum, bag, box, etc.)
- j. Other transportation-related markings.
  - 1) Orange panel and hazard codes.
  - 2) Stenciled railcars.
  - 3) Package labels (e.g. orientation arrows).
  - 4) Pipeline markers.
  - 5) Fumigant.
  - 6) Hot.
  - 7) Marine Pollutant.
  - 8) Orientation markings.
  - 9) ORM-D marking.
- k. Purpose of transportation markings.

“Placard and labels are a method of communication for **you!**”

*John Falat, CHP*

## Placarding Requirements (49 CFR 172)

<i>Other Hazards</i>	“Hazardous materials that possess secondary hazards <b>may</b> exhibit subsidiary placards...” (A commodity may have other hazards that aren’t always indicated by placards.)
<i>Dangerous</i>	A freight container, unit load device, transport vehicle, or rail car...with two or more categories of hazardous materials that require different placards specified in Table 2 <b>may</b> be placarded with a DANGEROUS placard <b>instead of</b> the separate placarding...
<i>Requirement</i>	A transport vehicle or freight container that contains less than 454 kg (1001 pounds) aggregate gross weight of hazardous materials covered by Table 2 does <b>not</b> have to display a placard.
<i>ID Numbers</i>	Identification (UN) numbers may be displayed on either a rectangular shaped orange panel or on a plain white placard.



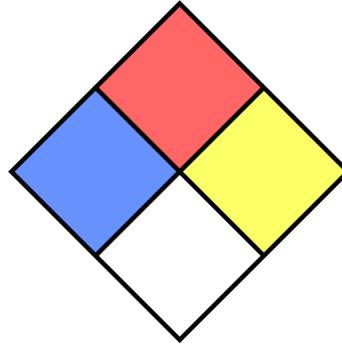
<i>Fumigant</i>	Shows when a trailer, railcar or shipping container has been or is being fumigated.
<i>Hot</i>	Means what it says. Used to warn responders of elevated-temperature cargoes. (e.g. molten sulfur)
<i>Marine Pollutant</i>	Materials toxic to or that can bioaccumulate in aquatic organisms.
<i>Orientation</i>	Shows required orientation of a package when the inner packaging contains hazardous liquids.
<i>ORM-D</i>	Affixed to packages containing materials, such as consumer commodities, that present a limited hazard.

## 7. Special Markings.

- a. NFPA 704.
  - 1) Scope, applicability, purpose, locations and limitations.
    - a) Scope: Addresses health, flammability, instability and related hazards presented by short-term exposure.
    - b) Applicability: Applies to industrial, commercial and institutional facilities (required by California Fire Code).
    - c) Purpose: Provide basic information to emergency responders.
    - d) Location(s): Stationary containers, above-ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled. Local fire marshal may specify other required locations.
    - e) Limitations: Doesn't indicate quantity or specific location(s) of material(s). Doesn't identify material(s).
  - 2) Required marking.
    - a) Diamond-shaped.
    - b) Quadrants color-coded by hazard.
    - c) Numerical rating of hazard (0-4).
  - 3) More details in subsequent chapter.
- b. Hazard/Product-specific markings.
  - 1) Biohazard. Indicates presence of material or microorganism(s) that pose a threat to the health of living organisms. Required by OSHA on containers of regulated waste, refrigerators and freezers containing blood or other potentially infectious material.
  - 2) PCBs. EPA regulations require label with white or orange background warning of presence of PCBs.

# Special Markings

*NFPA 704*



*Biohazard markings*



*PCB label*

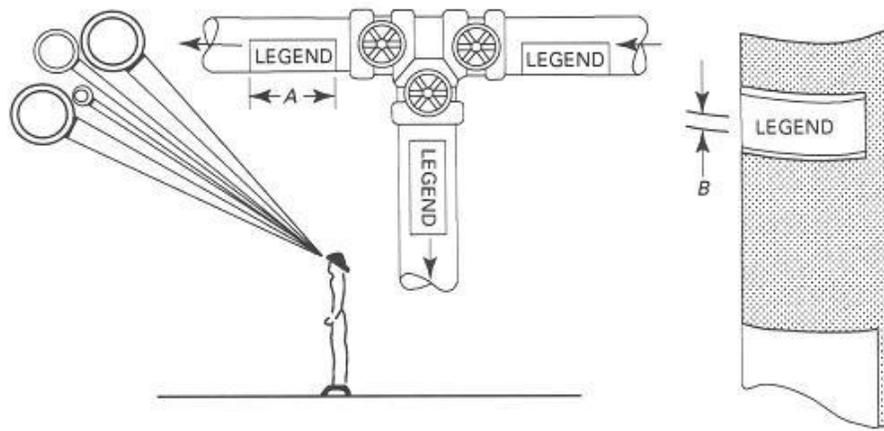


## 7. Special Markings (*contd.*).

- c. Location-specific markings.
    - 1) Industrial pipe markings (ANSI/ASME A13.1).
      - a) Purpose. Inform workers (and responders) of the contents of pipes and give additional detail if special hazards (such as extreme temperatures or pressures) exist.
      - b) Colors indicate type of hazard. (See facing page.)
      - c) Identification markings show contents of pipe and may indicate direction of flow. (See facing page.)
    - 2) Military markings.
      - a) Fire/Ordnance Hazards.
      - b) Chemical Hazards.
  - d. Transportation mode-specific markings.
    - 1) Pipeline markers (USDOT).
    - 2) Railcar stenciling.
  - e. Hazard communication markings.
    - 1) HMIS®
    - 2) WHMIS
    - 3) ISO-3864
    - 4) GHS
  - f. Pesticide and consumer product labels.
    - 1) Labels: state active ingredient.
    - 2) Signal Words: Poison (pesticides only) Danger, Warning or Caution.
    - 3) Some pesticides require signage at area of application warning of the presence of the pesticide.
- Note: For detailed information on these marking systems see, the pages at the end of this chapter.*

# Industrial Pipe Markings

Fig. 1 Location of Identification Markers



Designation of Colors	Background Color	Letter Color
Fire Quenching Fluids	Red	White
Toxic & Corrosive Fluids	Orange	Black
Flammable fluids	Yellow	Black
Combustible Fluids	Brown	White
Water	Green	White
Compressed Air	Blue	White

## 8. Global Harmonization System (GHS).

- a. International system for classifying, marking and communicating hazards of materials that meet the GHS definition of hazardous.
- b. Communicates hazards via:
  - 1) Label elements.
    - a) Signal words.
    - b) Hazard statements.
    - c) Precautionary statement and Pictograms.
  - 2) Safety Data Sheets (more on this later).
- c. Signal words (Indicate severity of hazard).
  - 1) Danger. (More severe hazards.)
  - 2) Warning. (Less severe hazards.)
- d. Hazard statements.
  - 1) Standardized phrases.
  - 2) Assigned to a hazard class & category.
  - 3) Describes nature of hazard. (e.g. “Fatal If Swallowed”)
- e. Pictograms. (Uses graphic elements to convey specific hazards.)
  - 1) Hazard symbol.
  - 2) Other graphic elements (border and background).

# GHS Label

<b>PRODUCT IDENTIFIER</b> (CAS #67-63-0) <b>ISOPROPYL ALCOHOL</b>		<b>REFERENCE</b> PT375111
<b>WARNING !</b> Flammable solid. May ignite in moist air. Reacts violently with water. Corrosive material. Causes burns to the skin and eyes. May cause severe burns of mouth and throat. May be fatal if swallowed. May cause lung injury - effects may be delayed. May cause sensitization by skin contact.		
<b>PRECAUTION:</b> Keep away from heat, sparks and flame. Avoid contact with water. Keep away from incompatibles. Use with adequate ventilation. Keep container tightly closed. Handle in accordance with good industrial hygiene and safety practices. Do not swallow. Do not breathe dust. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Wear protective goggles, full face shield, impervious boots, gloves and apron.		
<b>REFER TO SAFETY DATA SHEET</b>		<b>FIRST AID:</b> If inhaled, remove from contaminated atmosphere. For skin contact, flush with water for at least 15 minutes, while removing contaminated clothing. Launder clothing before reuse. For eye contact, flush with running water for at least 20 minutes. If ingested, do not induce vomiting. Have victim rinse mouth with water, then let victim drink water or milk. Never give anything by mouth if victim is unconscious. For all cases, obtain medical attention immediately.
<b>PERSONAL PROTECTIVE EQUIPMENT</b> 	<b>SHIPPING DESCRIPTION</b> <b>ISOPROPYL ALCOHOL</b> UN 1092	

\* Describes recommended measures to minimize or prevent adverse effects of exposure and/or improper storage. GHS standardizes and specifies pictograms, signal words and hazard statements.

## 9. Shipping Papers and SDSs.

- a. Preferred Haz Mat identification source.
- b. Types and location of shipping papers:
  - 1) Truck: Bill of Lading (In cab near driver seat or with driver),
  - 2) Air: Air Bill (With pilot in cockpit),
  - 3) Rail: Waybill and Consist (With conductor),
  - 4) Vessel: Dangerous Cargo Manifest (On bridge).
- c. Shipping papers. "...each person who offers a hazardous material *for transportation* shall describe the hazardous material on the shipping paper..." (49 CFR 172.200) They include information such as: proper shipping name; hazard class or division; ID number, packing group; subsidiary hazard(s); total quantity and weight; reportable quantity, emergency phone number; etc. If non-hazardous commodities are listed on the shipping papers then the hazardous materials must be clearly indicated (e.g. listed first or in contrasting color). ***BUT shipping papers may not always be accurate, complete or in a readable state.***
- d. SDS (Safety Data Sheet). "Employers shall have a material safety data sheet *in the workplace* for each hazardous chemical which they use." [29 CFR 1910.1200(g)] It provides valuable information such as chemical name, company identification, hazard identification, response information, chemical/physical properties, etc.

## Locations of Shipping Papers

<i>General</i>	“...each person who offers a hazardous material for transportation shall describe the hazardous material on the shipping paper...”
<i>Contents</i>	<ul style="list-style-type: none"><li>• Proper shipping name.</li><li>• Hazard class or division (including any subsidiary hazards).</li><li>• Identification number (i.e. “UN number”).</li><li>• Packing group.</li><li>• Total quantity and unit of measure.</li><li>• Other information (see DOT regs).</li></ul>
<i>Aircraft</i>	“...operator shall provide the pilot-in-command...information in writing... A copy...shall be readily available...during flight.” (49 CFR 175.33)
<i>Vessels</i>	“This document [Dangerous Cargo Manifest] must be kept in a designated holder on or near the vessel’s bridge.” (49 CFR 176.30)
<i>Highway</i>	“...shipping papers shall be: Within his immediate reach when he is restrained by the lap belt... readily visible to a person entering the driver’s compartment or in a holder which is mounted to the inside of the door on the driver’s side of the vehicle...The driver shall ensure that the shipping papers are readily available to and recognizable by authorities in the event of accident or inspection.” (49 CFR 177.817)
<i>Rail</i>	“A member of the crew...must have a copy...” (49 CFR 174.24)

## 10. *First Operational Thought is Safety.*

- a. Think safety with every breath you take — or it may be your last (*Think safety first, last and always*).
- b. Should go *slow* in Hazmat event — A quick vs. go *slow* Hazmat response can kill or injure you and others.
- c. Must have “Positive” vs. “Negative” safety attitude.
- d. Negative safety attitude.
  - 1) “I’ve been handling this stuff for years...”
  - 2) “This is the way we’ve always done it. Nothing bad has happened yet.”
  - 3) Or, \_\_\_\_\_
- e. Positive safety attitudes:
  - 1) Use recognized safety procedures via vigilance and discipline,
  - 2) Develop awareness of possible secondary and tertiary hazards,
  - 3) Treat all Hazmat events with respect *and* anticipate problems,
  - 4) Cross reference 3 or more sources before action planning,
  - 5) Ensure back-up plans are in place for failure of safety devices,
  - 6) Set up and *use* decon procedures early.
- f. Maintain a “Mental Safe Approach Tactic” while on-scene!
  - 1) Always keep your distance.
  - 2) Approach Upwind, Upgrade and Upstream.
  - 3) Be a “responder” not an “indicator”.

## Mental Safe Approach.

Respond at a Safe Distance:

*Upwind*



*Upgrade*



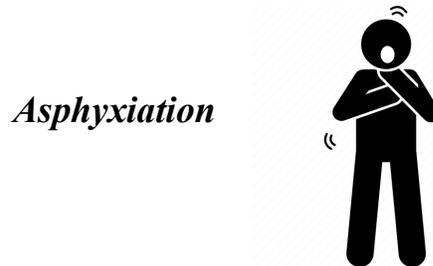
*Upstream*



**10. First Operational Thought is Safety. (continued)**

- g. Hazmat Death & Injury Due to Lack of Safety.
  - 1) Ways Hazmats can harm you—follow safety guides for *your own health and safety!*
    - a) Toxicity.
    - b) Radioactivity.
    - c) Asphyxiation.
    - d) Explosion.
    - e) Flammability.
    - f) Corrosion.
  - 2) There's a reason why they call it "hazardous" after all!
  - 3) **Remember: *First Operational Thought = Safety!***

## Six Ways Hazardous Materials Can Harm You...



## Specifications for Placards (49 CFR 172.519).

Placard with no ID number.



## Specifications for Placards (49 CFR 172.519)

Placard with ID number.



## Retention of DOT Placards and Labels—29 CFR 1910.1201 (effective October 17, 1994)

- (a) *Any employer* who receives a package of hazardous material which is required to be marked, labeled or placarded in accordance with the U. S. Department of Transportation’s Hazardous Materials Regulations (49 CFR Parts 171 through 180) *shall retain those markings, labels and placards on the package* until the packaging is sufficiently cleaned of residue and purged of vapors to remove any potential hazards.
- (b) *Any employer* who receives a freight container, rail freight car, motor vehicle, or transport vehicle that is required to be marked or placarded in accordance with the Hazardous Materials Regulations *shall retain those markings and placards on the freight container, rail freight car, motor vehicle or transport vehicle* until the hazardous materials which require the marking or placarding are sufficiently removed to prevent any potential hazards.
- (c) Markings, placards and labels shall be maintained in a manner that ensures that they are readily visible.
- (d) For non-bulk packages which will not be reshipped, the provisions of this section are met if a label or other acceptable marking is affixed in accordance with the Hazard Communication Standard (29 CFR 1910.1200).
- (e) For the purposes of this section, the term “hazardous material” and any other terms not defined in this section have the same definition as in the Hazardous Materials Regulations (49 CFR Parts 171-180).

## Specifications for Pipeline Markers (49 CFR 195.410)

- Who* Each pipeline “operator shall place and maintain line markers over each buried pipeline...”.
- Where* Markers must be located at each public road crossing, at each railroad crossing, and in sufficient number along the remainder of each buried line so that its location is accurately known. Each operator shall provide line marking at locations where the line is above ground in areas that are accessible to the public.
- What* The marker must state at least the following on a background of sharply contrasting color: The word “Warning”, “Caution”, or “Danger” followed by the words “Petroleum (or the name of the hazardous liquid transported) Pipeline”, or “Carbon Dioxide Pipeline”, all of which... must be in letters at least 1 inch high...; The name of the operator and a telephone number (including area code) where the operator can be reached at all times.
- But not here* Line markers are not required for buried pipelines located: offshore or at crossings of or under waterways and other bodies of water; in **heavily developed urban areas such as downtown business centers** where the placement of markers is impractical and would not serve the purpose for which markers are intended; and the local government maintains current substructure records.

## Biohazards Warnings. (CCR 5193)

*Labels*                      Warnings labels required on:  
Containers of regulated waste.  
Refrigerators and freezers containing blood or other potentially infectious material.  
Other containers used to store, transport or ship blood or other potentially infectious materials.  
May substitute red bag or red container for label under certain conditions. (Regulated waste must also have a label.)

*Signs*                        Work areas containing infectious materials must have a Biohazard sign posted on every entrance. Must also have the name of the infectious agent, information on special requirements for entering the area and the name and phone number of the responsible person.

*Symbol*



*Lettering*                    The symbol must have the words “BIOHAZARD” or “BIOHAZARDOUS WASTE” under the symbol.

# Hazardous Materials Identification System®

*History*

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. J. J. Keller is the exclusive provider of the components of the system ([www.jjkeller.com](http://www.jjkeller.com)).

*System*

The system uses color-coded labels with numbers and symbols to present acute and chronic health, flammability, and physical hazard warnings, as well as to designate appropriate personal protective equipment (PPE) and indicate target organs. The color scheme and hazard ranking is similar to NFPA 704. (HMIS® is intended to inform employees of hazards while NFPA 704 is intended to inform responders of hazards.)



## DOD Hazard Identification System.

*Applicability* 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 facility commander. Under some conditions security considerations may make it undesirable to identify storage locations of munitions.)

*Fire Divisions* This system uses four symbols to indicate a fire hazard. The symbols are orange and have the Fire Division number in the center.

Fire Division	Hazard	Symbol Shape
1	Mass Explosion	Octagon
2	Explosion with fragment hazard	Cross
3	Mass fire	Inverted triangle
4	Moderate fire	Diamond
5	Mass explosion (blasting agents)	Octagon
6	Nonmass explosion	Cross

*Chemical Agents* The system uses two symbols to indicate the recommended protective equipment to use when responding to a fire.



Wear full protective clothing. (Color-coded to indicate the degree of hazard.)



Wear breathing apparatus.

## “Stenciled” Railcars, 49 CFR 172.330.

### General

“A tank car containing any of the following materials must be marked on each side with the key words of the **proper shipping name** specified for the material in the Sec. 172.101 table, or with a **common name authorized** for the material in this subchapter (e.g., ‘Refrigerant Gas’):”

- Acrolein, stabilized
- Ammonia, anhydrous, liquefied
- Ammonia solutions (more than 50% ammonia)
- Bromine or Bromine solutions
- Bromine chloride
- Chloroprene, stabilized
- Dispersant gas or Refrigerant gas
- Division 2.1 materials
- Division 2.2 materials (in Class DOT 107 tank cars only)
- Division 2.3 materials
- Formic acid
- Hydrocyanic acid, aqueous solutions
- Hydrofluoric acid, solution
- Hydrogen cyanide, stabilized (less than 3% water)
- Hydrogen fluoride, anhydrous
- Hydrogen peroxide, aqueous solutions (greater than 20% hydrogen peroxide)
- Hydrogen peroxide, stabilized
- Hydrogen peroxide and peroxyacetic acid mixtures
- Nitric acid (other than red fuming)
- Phosphorus, amorphous
- Phosphorus, white dry or...under water or...in solution
- Phosphorus white, molten
- Potassium nitrate and sodium nitrate mixtures
- Potassium permanganate
- Sulfur trioxide, stabilized
- Sulfur trioxide, uninhibited

## Additional DOT Labeling Requirements.

*Marine Pollutant* “The **MARINE POLLUTANT** mark shall be placed in association with the hazard warning labels required by subpart E of this part or, in the absence of any labels, in association with the marked proper shipping name.” 49 CFR 172.322

*Biohazard* “In addition to other requirements of this subpart, after September 30, 2003, a bulk packaging containing a regulated medical waste, as defined in Sec. 173.134(a)(5) of this subchapter, must be marked with a **BIOHAZARD** marking conforming to 29 CFR 1910.1030(g)(1)(I).” 49 CFR 172.323

*Hot* “...a bulk packaging containing an elevated temperature material must be marked on two opposing sides with the word “**HOT**” in black or white Gothic lettering on a contrasting background. The marking must be displayed on the packaging itself or in black lettering on a plain white square-on-point configuration having the same outside dimensions as a placard. (See Sec. 172.302(b) for size of markings on bulk packagings.)” 49 CFR 172.325

*Orientation* “...each non-bulk combination package having inner packagings containing liquid hazardous materials must be... Legibly marked, with **package orientation markings**...with the arrows pointing in the correct upright direction. Depicting a rectangular border around the arrows is optional.” 49 CFR 172.312

## Pesticide Labels, 40 CFR 156.10.

<i>General</i>	<p>“Contents of the label. Every pesticide products shall bear a label containing the information specified by the Act and the regulations in this part. The contents of a label must show clearly and prominently the following:”</p> <p>Name, brand, or trademark of the pesticide.</p> <p>Name and address of the producer.</p> <p>Net contents.</p> <p>Product registration number.</p> <p>Producing establishment number.</p> <p>An ingredient statement. (Specifying active and inert ingredients.)</p> <p>Hazard and precautionary statements for human and domestic animal hazards and environmental hazards.</p> <p>The directions for use.</p> <p>The use classification(s).</p>
----------------	--

## Field Postings, Title 3 CCR §6776.

<i>Signs</i>	<p>“The operator of the property shall assure that signs are posted around treated fields...The signs shall contain the following:</p> <p>(1) The skull and crossbones symbol near the center of the sign; (2) The words “DANGER” and “PELIGRO” and “PESTICIDES” and “PESTICIDAS” in the upper portion of the sign; (3) The words “KEEP OUT” and “NO ENTRE” in the lower portion on the sign;”</p>
<i>Posting</i>	<p>“The signs shall...Be posted before the application begins...Remain posted and clearly legible throughout the application and the restricted entry interval...The signs shall be posted so that they are visible at all usual points of entry to the treated area...”</p>

## GHS Pictograms

	<p><b>Health Hazard</b></p> <ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Mutagenicity</li> <li>• Reproductive Toxicity</li> <li>• Respiratory Sensitizer</li> <li>• Target Organ Toxicity</li> <li>• Aspiration Toxicity</li> </ul>
	<p><b>Exclamation Point</b></p> <ul style="list-style-type: none"> <li>• Irritant (skin and eye)</li> <li>• Skin Sensitizer</li> <li>• Acute Toxicity (harmful)</li> <li>• Narcotic Effects</li> <li>• Respiratory Tract Irritant</li> <li>• Hazardous to Ozone Layer (Non Mandatory)</li> </ul>
	<p><b>Flammable</b></p> <ul style="list-style-type: none"> <li>• Flammables</li> <li>• Pyrophorics</li> <li>• Self-Heating</li> <li>• Emits Flammable Gas</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>
	<p><b>Gas Cylinder</b></p> <ul style="list-style-type: none"> <li>• Gases under Pressure</li> </ul>
	<p><b>Corrosive</b></p> <ul style="list-style-type: none"> <li>• Skin Corrosion/ burns</li> <li>• Eye Damage</li> <li>• Corrosive to Metals</li> </ul>

## GHS Pictograms

	<p><b>Explosive</b></p> <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>
	<p><b>Oxidizer</b></p> <ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>
	<p><b>Environmental Hazard</b></p> <ul style="list-style-type: none"> <li>• Aquatic Toxicity (non mandatory)</li> </ul>
	<p><b>Toxic Hazard</b></p> <ul style="list-style-type: none"> <li>• Acute Toxicity (fatal or toxic)</li> </ul>

## Module Review – Word Search

Z H U G R N H I P O L L G V R  
Z J D C X B X P K C A V Y R S  
E D I C I T S E P C B Q R E I  
R S L O A P L U I U E G C N I  
W L G J J L S G M P L U L I N  
A S K N I M O R E A B U K L R  
D K M B I L S T E N C I L E D  
Q A Y U O K Q P W C S K C P X  
S A N I N G R O M Y Y O T I B  
W A D G H W H A T P G Y G P L  
W A F J E T J E M N S B I R T  
R X R E R R W F I B Y E F N K  
M K T U T W O Z P L A C A R D  
P F C O F Y E U O N P X D Z G  
K K O E D K V B S V F M B A G

**Find the following words in the word search above.**

DANGEROUS	PLACARD
DOT	RADIOLOGICAL
LABEL	RECOGNIZE
MARKINGS	RIBS
OCCUPANCY	SAFETY
PESTICIDE	STENCILED
PIPELINE	TRUCK
	WAYBILL

## Chapter D

### *Safety, Isolation and Notifications: (S.I.N.)*

#### Main Points

- Definition of “First Responder” & “SIN”
- The First Operational Thought—Safety
- The First Operational Priority—Isolation
- The First Operational Alert—Notifications

## Chapter Outline

### 1. Definition of First Responder and “SIN”.

- a. Definition of First Responder Awareness and Operations levels:
  - 1) First Responder “Awareness”: One likely to witness or discover a hazmat release and can initiate a response by notifying authorities, *taking no further actions* (SIN only). 29 CFR 1910.120(q)(6)(i), Title 8 CCR 5192(q)(6)(A).
  - 2) First Responder “Operations”: One who responds to hazmat releases for purpose of protecting nearby persons, environment or property — *trained in a defensive fashion without trying to stop the release* (SIN + CIAPCPDDD). 29 CFR 1910.120(q)(6)(ii), Title 8 CCR 5192(q)(6)(B).
- b. Definition of “SIN”:
  - 1) Safety,
  - 2) Isolation,
  - 3) Notifications.
- c. All hazmat responders should “SIN” as the basic initial on–scene actions at all hazmat incidents.

## Response Levels and Tactical Acronym

<b>Tactic</b>	<b>FRA</b>	<b>FRO</b>	<b>IC</b>	<b>Tech/Spec</b>
Safety	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Isolation	<b>X</b>	<b>X</b>	<b>X</b>	
Notify	<b>X</b>	<b>X</b>	<b>X</b>	
Command		<b>X</b>	<b>X</b>	
IDHA		<b>X</b>	<b>X</b>	<b>X</b>
Action Plan		<b>X</b>	<b>X</b>	<b>X</b>
Protective Equip.		<b>X</b>	<b>X</b>	<b>X</b>
Countermeasures		<b>X</b>	<b>X</b>	<b>X</b>
Protective Action		<b>X</b>	<b>X</b>	<b>X</b>
Decon		<b>X</b>	<b>X</b>	<b>X</b>
Disposal		<b>X</b>	<b>X</b>	<b>X</b>
Documentation		<b>X</b>	<b>X</b>	<b>X</b>

## 2. The First Operational Thought — SAFETY.

- a. The first operational *thought* for everyone = **Safety!**
  - 1) Safety starts with the first responder on-scene!
  - 2) Responders must have a Positive Safety Attitude.
- b. Three techniques to ensure safety and a positive safety attitude:
  - 1) Safe Approach,
  - 2) Safe Assessment,
  - 3) Key Safety Guides for all responders to follow.
- c. Approach Hazmats from a safe *direction* (Upwind, Upgrade & Upstream), and a safe *distance* (per ERG).
  - 1) Remember to keep vehicles headed away from incident.
- d. Conduct a safe assessment/size-up:
  - 1) Do not get close enough for positive identification.
  - 2) Slow vehicle down, shut off air/ventilation and observe area.
  - 3) Position vehicles headed away from incident.
  - 4) Use binoculars to identify/assess incident.
- e. Desired First Responder initial actions:
  - 1) Safe approach at a safe distance,
  - 2) Isolate and deny entry,
  - 3) Make initial Notifications,
  - 4) Establish temporary command.

# S.I.N.



## 2. The First Operational Thought — SAFETY (*cont.*)

- f. Ten key safety guides on-scene:
  - 1) Be cautious; treat materials as hazardous until proven otherwise.
  - 2) Approach upwind, upgrade and upstream.
  - 3) Keep safe distance until IDHA complete and risk is confirmed.
  - 4) Isolate and deny entry (limit number of responders).
  - 5) Do not rush to victims without doing a risk assessment (Risk vs. Gain) and wearing proper protective equipment.
  - 6) Do not touch, taste or breathe unknown released material (do not assume vapor is harmless due to lack of smell).
  - 7) Do not eat, drink or smoke in incident area.
  - 8) Eliminate all ignition sources (incl. flares) near incident area.
  - 9) Establish and observe safety perimeters and control zones.
  - 10) Do not worry about looking foolish (your health and the health of others is at stake). Think safety!
  
- g. OSHA regulations, 29 CFR 1910.120(q) and Title 8 CCR 5192(q), *require* IC to designate a Safety Officer/Officer.
  - 1) Safety Officer ensures safety on-scene by conducting safety related activities—*can suspend any unsafe act*.
  - 2) Site Safety Plan is a common tool to ensure safe response on-scene.
  - 3) Every hazmat response should have a Safety Officer assigned and a Site Safety Plan (preferably in writing).
  - 4) You should know who the Safety Officer is and should read (and follow!) the site safety plan.

## Safety Official

### **29 CFR 1910.120(q)(3), Title 8 CCR 5192(q)(3)**

“(vii) The individual in charge of the ICS shall designate a safety official, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of the operations for the emergency at hand.

(viii) When activities are judged by the safety official to be an IDLH and/or to involve an imminent danger condition, the safety officer shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions needed to be taken to correct these hazards at the emergency scene.”

### 3. The First Operational Priority — ISOLATION.

- a. The first operational *priority* = Isolate and deny entry!
  - 1) Responders can safely attempt to isolate and deny entry by establishing Perimeters using ERG recommendations.
  - 2) The dilemma of distance. Safety vs. isolation (distance is safety's #1 ally, while it is isolation's #1 enemy).
- b. Perimeter and Zones.
  - 1) Purpose: ensure safety and isolation, control the scene, limit contamination spread and allow for safe working areas.
  - 2) Main difference: FRAs and FROs usually set-up Perimeters, while Technicians/Specialists set-up Control Zones.
- c. Perimeter and Control Zone terminology:
  - 1) **Perimeter** (Outside security line around all Control Zones).
  - 2) **Exclusion/Hot Zone** - Area of isolation (only responders with specific task & proper level of protective clothing in this Zone).
  - 3) **Contamination Reduction/Warm Zone** - Used to control areas like Safe Refuge and Decontamination (may use a reduced protective clothing level in this Zone).
  - 4) **Support/Cold Zone** - Safe area for Command Post, Media, medical aid, etc. (No protective clothing or SCBA required).
  - 5) Exclusion Zone, Contamination Reduction Zone and Support Zone are all within the Perimeter.
  - 6) *A FRA should only be in the Support Zone.*

## Perimeters and Zones

### First Operational Priority — *Isolate & Deny Entry...*

- Perimeter* Security line surrounding control zones to isolate and deny entry to any unnecessary people, usually established by law enforcement.
- Zone* Zones to ensure safety, limit spread of the hazard, control hazard area, conduct decon and support emergency operations *as established by Haz Mat Group*.
- Examples* **Exclusion Zone:** Also called Hot Zone, Red Zone, Inner Perimeter.  
**Contamination Reduction Zone:** Also called Warm Zone, Yellow Zone, Secondary Perimeter.  
**Support Zone:** Also called Cold Zone, Green Zone, Outer Perimeter.
- (Control Zone terms from *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH Publication 85-115, October 1985.)



### 3. The First Operational Priority — ISOLATION (*cont.*)

d. Perimeter Control Objectives:

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

e. Perimeter Control Tactics:

- 1) Determine size and extent of perimeter (using ERG).
  - a) Current and expected weather.
  - b) Type of terrain.
  - c) Potential size of release.
  - d) Condition of container (i.e. extent and type of damage).
- 2) Identify all entry points.
- 3) Control all entry points.
- 4) Identify and establish boundaries for Perimeter.
  - a) Unstaffed barricades often ineffective.
  - b) Be aware of ignition sources from vehicles.
  - c) Use existing barriers.
- 5) Control access to the perimeter.
  - a) Deny entry to all unauthorized personnel.
  - b) Stage all responders without an immediate mission.
  - c) Establish emergency exit procedures for all responders.
  - d) Hazmat Group will establish Control Zones.
  - e) ***Watch out for wind shifts!***

## Isolation and Deny Entry Objectives

### ***Entry Points***

#### ***Control Entry Points***

- Visually determine isolation distance for Perimeter.  
(ERG may often recommend downwind perimeter up to 2-3 times larger distance than crosswind perimeter.)
- Identify closest entry/control points for Perimeter. (e.g. doorways, intersections, gates, etc.) Others: \_\_\_\_\_
- Start with most obvious and most commonly used Perimeter entry point. (FEMA studies have shown people will evacuate through exits they are accustomed to using.)
- Make early request for sufficient units to secure entry points. (Use Law Enforcement or Auxiliary/Reserve Units. Give incident location and safe routes for ingress.)
- Use all available methods of restricting access (e.g. vehicles, barricades, cones, etc.) Others: \_\_\_\_\_
- Identify staging areas for responders.

### ***Hazard***

#### ***Control Area Around Hazard***

- Secure the area around the hazard area.
- Use tape, natural barriers, patrols, etc.
- Remember, it's easier to make a perimeter smaller than bigger after you establish it. Don't be afraid to start big.

### ***Perimeter***

#### ***Control Access Inside Perimeters.***

- Keep public and nonessential responders out.
- Maintain patrol of Perimeter area.
- Provide security for Support Zone work areas.
- Provide traffic control as necessary.
- Maintain communications with security group at all times!
- Have an emergency escape route and watch the wind!!

#### 4. The First Operational Alert — NOTIFICATIONS.

- a. Three types of Notifications to alert others of a hazmat event:
  - 1) Mandatory Notifications,
  - 2) Resource requests,
  - 3) Report of Conditions.
  
- b. Responsible Party must notify authorities of a hazmat release or potential release. *Legal penalties possible for non-notification.*
  - 1) Responders should make same notifications as back-up.
  - 2) Mandatory notifications:
    - a) Local dispatch (Local 911),
    - b) CUPA/Local Administering Agency (#: \_\_\_\_\_),
    - c) State Warning Center (800-852-7550),
    - d) National Response Center (800-424-8802).
  - 3) Other notifications per specific incident:
    - a) Pesticide spill – County Agriculture,
    - b) Spill in state waters – OES (who must notify RWQCB, OSPR & State Lands Commission),
    - c) Spill on state highway/freeway (incl. county roads) – CHP,
    - d) Radiological release – DHS (Radiological Branch),
    - e) Release impacting state wildlife – Dept. of Fish & Wildlife,
    - f) Acutely hazardous material within 1/2 mile of school – School District Superintendent. Note: Responders must make this notification.
    - g) Oil spills (if responsible party has not done so).
    - h) Prop 65 Haz Mats – Board of Supervisors & Health Officer. (For “designated employees” only. If you’re not sure if you’re a designated employee then you’re not one.)
    - i) Workplace injury/fatality – CalOSHA.

Note: Responders must make notifications for f-i.

## Legal Requirements for Notifications

<i>NRC</i>	“Notice of an oil discharge or release of a hazardous substance in an amount equal to or <b>greater than the reportable quantity</b> must be made immediately...to the NRC duty...” 40 CFR 300.125(c).
<i>CUPA/AA</i>	“(a) ... provide an immediate, verbal report of <b>any release or threatened release</b> of a hazardous material to the Administering Agency and the [OES]...(d) The [AA] may designate a call to the 911 ... as meeting the requirement to call the [AA].” Title 19 CCR 2703.
<i>OES</i>	“... immediately report any release or threatened release of a hazardous material to the administering agency and the [OES].” §25507, California Health & Safety Code.
<i>Transportation</i>	“...each carrier who transports hazardous materials (including hazardous wastes) shall give notice in accordance with paragraph (b) of this section after each incident...” 49 CFR 171.15 (federal regulation) Title 13 CCR 1166 (equivalent California regulation).
<i>Schools</i>	“...emergency response personnel, responding to the reported release or threatened release of a hazardous material...shall immediately advise the superintendent of the school district having jurisdiction, if the location of the release or threatened release is within one-half mile of a school.” §25510.3 Health & Safety Code.
<i>Oil</i>	“Any local or state agency responding to a spill of oil shall notify the Office of Emergency Services, if notification...has not occurred.” §8670.26 California Government Code.
<i>Injury/Fatality</i>	Emergency responders must notify CalOSHA when they are “... called to an accident...in which a serious injury, or illness, or death occurs...” Title 8 CCR §342(b)

#### 4. The First Operational Alert — NOTIFICATIONS (*cont.*)

- 4) General information needed for mandatory notifications:
  - a) Name/Agency of person reporting,
  - b) Location of hazmat release,
  - c) Hazmat involved,
  - d) Nature of problem,
  - e) Quantity released,
  - f) Potential hazards.
- 5) Key point of notification for state agencies is State Warning Center.
  - a) State Warning Center will provide control number (important for mutual aid and funding).
  - 6) Notification checklist may help.
- c. Resource Request Notification.
  - 1) Types of resources to request:
    - a) Agencies/Personnel (Law, Fire, EMS, Health, etc.),
    - b) Materials/Equipment (Hazmat Team),
    - c) Facilities (ICP, EOC, evacuee shelters, etc.),
  - 2) Off-site resources (CHEMTREC, CHLOREP, USA and Poison Control Centers). Other: \_\_\_\_\_
  - 3) Key question: How do I get help? Who do I call?

## Private Sector Assistance

- CHEMTREC* Provides technical emergency response information concerning the product(s) involved. Information is obtained from several sources, including the manufacturer's product-specific Safety Data Sheet or a product specialist from the manufacturer.
- CHEMTEL* Provides immediate guidance regarding the incident. Should additional support be required, ChemTel will dispatch Hazmat Response Teams with client authorization.
- INFOTRAC* INFOTRAC operators will evaluate the chemical emergency and will then disseminate all information necessary, related to evacuation radius, fire-fighting procedures, incompatibility with other products, protective clothing requirements, and any other additional information needed. They will then notify the INFOTRAC member, advise as to the status of the emergency, and if necessary, interlink them with the emergency site location via the Command Center interlink.
- Verisk 3E* 3E's HazMat Response Team can deploy ER professionals and equipment. They can also provide immediate access to medical advice related to chemical exposures. Poison control specialists, physicians, and toxicologists provide medical advice related to chemical exposures, including skin/eye contact, inhalation and ingestion.

#### 4. The First Operational Alert — NOTIFICATIONS (*cont.*)

- 4) Know your local resources for Haz Mat and request early.
  - 5) Stage incoming resources until needed and give arriving resources a safe route of access.
  - 6) You are not alone (many Hazmat resources are available), *but* you must contact, coordinate and manage resources properly!
- d. Report of Conditions Notification.
- 1) Report of Conditions includes:
    - a) What you see in and around hazard area,
    - b) What you need,
    - c) What you are doing.
  - 2) Report of Conditions helps IC assess basic actions, identify needed resources, and begin the IDHA process.

# Hazmat Notification Guide

<u>Agency/Organization</u>	<u>Phone #</u>	<u>Time</u>	<u>Person Notified</u>
<b>Local</b>			
First Responders (Fire, PD, etc.)*	_____	_____	_____
Administering Agency*	_____	_____	_____
County OES	_____	_____	_____
County Agriculture Dept.	_____	_____	_____
County Health	_____	_____	_____
Local Hazmat Team	_____	_____	_____
Animal Control	_____	_____	_____
Other	_____	_____	_____
<b>State</b>			
OES Warning Center*	_____	_____	_____
Highway Patrol	_____	_____	_____
Fish and Wildlife	_____	_____	_____
Dept. of Toxic Substances Control	_____	_____	_____
Other	_____	_____	_____
<b>Federal</b>			
National Response Center*	_____	_____	_____
Coast Guard	_____	_____	_____
EPA Region IX	_____	_____	_____
Other	_____	_____	_____
<b>Private</b>			
CHEMTREC	_____	_____	_____
Local Cleanup Company	_____	_____	_____
Underground Services Alert	_____	_____	_____
Regional Poison Control Center	_____	_____	_____
Hospitals	_____	_____	_____
Other	_____	_____	_____
<b>Special Districts</b>			
Air Quality Mgt. District	_____	_____	_____
Regional Water Quality Cntl. Brd.	_____	_____	_____
Flood Control Districts	_____	_____	_____
School Districts	_____	_____	_____
Sewer Districts	_____	_____	_____
Other	_____	_____	_____

*\*Mandatory Notifications*

## Do This!

- DO think safety and consider it a big deal!!!
- DO report your location.
- DO stay upwind, uphill and upgrade.
- DO isolate and deny entry.
- DO establish perimeters and observe zones.
- DO notify and request assistance early.
- DO establish command & practice unity of command.
- DO complete identification and assessment.
- DO have alternative plans and consider no action.
- DO recognize your limits.
- DO forecast your intervention and expect change.
- DO weigh risk against gain (benefits).
- DO wear protective clothing.
- DO maintain control of the incident.
- DO evacuate and warn public early.
- DO decontaminate & document before demobilization.
- DO communicate & coordinate with other agencies.
- DO ensure the safety of all on-scene personnel!
- DO

---

(Fill in your recommendation)

## Don't Do This!

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

---

(Fill in your recommendation)

## California Vehicle Code and Notifications

### Public Health

*VC §2451* “The Legislature finds and declares that a statewide program for the management of hazardous substances highway spills, under the jurisdiction of the California Highway Patrol, is necessary to protect the public health and environment.”

### Hazardous Spill Notification System

*VC §2453* “The California Highway Patrol shall serve as a statewide information, assistance, and notification coordinator for all hazardous substances spill incidents occurring on highways within the State of California. The California Highway Patrol shall establish a single notification mechanism...”

### Incident Command Authority

*VC §360* “‘Highway’ is a way or place of whatever nature, publicly maintained and open to the use of the public for purposes of vehicular travel. *Highway includes street.*” (italics added)

*VC §2454* (a) The authority for incident command at the scene of an on-highway hazardous substance spill or disaster shall be vested in the **appropriate law enforcement agency having primary traffic investigative authority on the highway where the spill or disaster occurs.** Responsibility for incident command at the scene of an on-highway hazardous substance spill or disaster shall continue until all emergency operations at the scene have been completed and order has been restored.

## Module Review – Word Match

<b>Description</b>	<b>Term</b>
Can send you an SDS.	Incident Commander
A mandatory notification.	NRC
The “I” in SIN.	Exclusion
First Operational Thought.	CHEMTREC
A responder who can SIN only.	Fish and Wildlife
Notification contact for federal government	Awareness
OSHA requires this ICS position.	CHLOREP
The zone where the bad stuff is.	State Warning Center
The agency to call if a spill impacts wildlife.	Isolate
Call this organization for chlorine incidents.	Safety

*Instructions*      Match the description with the proper term. Draw a line from the description to the term associated with it.



## Chapter E

### *Basic Command and IDHA*

#### Main Points

- Basics of Incident Command
- Identification and Hazard Assessment Process
- Identification Sources
- Assessment Sources
- DOT Emergency Response Guidebook
- Container System Stress and Behavior
- IDHA Complications

# Chapter Outline

## 1. Basics of Incident Command.

- a. Role of FRA specified in emergency response plan and/or standard operating guidelines. (What does yours say?)
  - 1) Know your role in the organization.
  - 2) What position are you assigned to?
  - 3) Who do you report to?
  - 4) FRA should assume temporary/initial command until the authorized Incident Commander arrives.
- b. Purpose of ICS: Provide effective coordination among local, state, and federal responders at the scene of a hazmat response.
- c. Need for ICS.
  - 1) Need efficient tool to manage emergency response to hazmat
  - 2) Hazmat incidents often cross-jurisdictional boundaries. incidents, ICS provides tools for managing multi-jurisdictional responses to hazardous substance releases.
  - 3) OSHA regulation requires an IC and use of ICS.
- d. Benefits of ICS.
  - 1) Provides standardized organizational structure and common processes for planning and managing resources.
  - 2) Enables a coordinated response among various jurisdictions and functional agencies, both public and private.
  - 1) Provides standardized roles, responsibilities and S.O.P.s to manage and direct emergency responses.

## Requirements for using ICS.

### California Government Code Section 8607

*SEMS* “By December 1, 1993, the Office of Emergency Services...shall jointly establish by regulation a standardized emergency management system for use by all emergency response agencies... This system shall be applicable, but not limited to, those emergencies or disasters referenced in the state emergency plan. ...state agencies shall use the standardized emergency management system...to coordinate multiple jurisdiction or multiple agency emergency and disaster operations. ...each local agency...shall use the standardized emergency management system...to coordinate multiple jurisdiction or multiple agency operations.”

### 29 CFR 1910.120(q)(3)(i)

*Fed OSHA* “The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.”

### Title 8 CCR Section 5192(q)(3)(A)

*State OSHA* “The senior emergency response official who has ultimate site control responsibility shall confirm that the Incident Command System (ICS) is in place and the position of Incident Commander (IC) instituted. All emergency responders and their communications shall be coordinated and controlled through the ICS.”

## 2. Identification and Hazard Assessment Process.

- a. The most critical aspects of a hazardous materials response is “Identification and Hazard Assessment” (IDHA).
  - 1) All further decisions flow from this.
  - 2) OSHA regs require the IC to do IDHA (“identify... all hazardous substances or conditions present...”)
  - 3) Can’t protect yourself from a problem if you can’t identify *and* assess the problem!
  
- b. Hazard assessment starts immediately.
  - 1) Starts with initial discovery/notification.
  - 2) Use recognition clues and common sense.
  - 3) Caution: Initial reports may not be accurate or complete.
  
- c. The basic FRA IDHA process:
  - 1) Identify material(s) involved.
  - 2) Consult ERG and/or SDS.
  - 3) Do what it says and follow your employer’s policies.
  
- d. Basic IDHA questions.
  - 1) Will something bad happen *right now*?
    - a) Is it on fire?
    - b) Can it explode or burn?
    - c) Is it a gas or vapor that can come after me?
  - 2) If something bad happens, will it hurt *me*?
    - a) Is it toxic?
    - b) Is it flammable?
    - c) Is it corrosive?
    - d) Is it radioactive?

## Will it Burn or Blow Up *Right Now*?

“Explosive” placard visible?



Gas cylinder under stress?



Polymerization hazard?

**“POL” “130P”**

Visible gas or vapor?



Bottom line:

***Will this happen?***



### 3. Identification Sources.

- a. Safety Data Sheet.\*
  - 1) Required by OSHA Hazard Communication Regulation.
  - 2) Purpose: Inform employees of “hazardous chemicals” present.
  - 3) Methods of transmitting information.
    - a) Comprehensive hazard communication programs.
    - b) Container labeling and other forms of warning.
    - c) Safety data sheets and.
    - d) Employee training.
  - 4) SDS a major source of hazard information.
  - 5) SDS can provide information on:
    - a) Physical properties.
    - b) Hazards of material.
    - c) Signs and symptoms of exposure.
    - d) Exposure levels.
    - e) PPE recommended.
    - f) Manufacturer contact information.
    - g) See facing page for sections of SDS.
  - 6) Who can provide an SDS.
    - a) Workplace involved in incident.
    - b) Manufacturer and/or distributor of product.
    - c) CHEMTREC.

- \* OSHA Hazard Communication regulation will only allow Safety Data Sheets after 2015. All MSDSs must be converted to new SDS format by 2015. You may still find some that haven’t been converted.

## Sections of Safety Data Sheets (SDS).

*Format* As of 6/1/2015 all Safety Data Sheets must be in a uniform format. They will contain the following information:

Section	Description
1	Identification of the substance/mixture and the company/undertaking
2	Hazards identification (assessment)
3	Composition/information on ingredients
4	First aid measures
5	Fire fighting measures
6	Accidental release measures
7	Handling and storage
8	Exposure controls/personal protection
9	Physical and chemical properties
10	Stability and reactivity
11	Toxicological information
12	Ecological information
13	Disposal considerations
14	Transport information
15	Regulatory information
16	Other information

### 3. Identification Sources. *(continued)*

- b. DOT placards, labels and markings.
  - 1) Stenciled railcars.
  - 2) ID # on placards and orange panels.
  - 3) Hazard identification code on orange placard.
  - 4) DOT Radioactive labels.
    - a) White-I (lowest level of radiation)
    - b) Yellow-II
    - c) Yellow-III (highest level of radiation)
- c. Shipping papers have following hazard ID info:
  - 1) Proper shipping name. (Hazmat(s) listed first, shown in a contrasting color or marked with an “X” in the “HM” column.)
  - 2) Hazard class.
  - 3) Identification (UN) number.
  - 4) Packing Group. (Indicates degree of hazard and the degree of protective packaging required.)
    - a) Packing Group I. (Great danger.)
    - b) Packing Group II. (Moderate danger.)
    - c) Packing Group III. (Minor danger.)
- d. Pipeline markers have following hazard ID info:
  - 1) Level of hazard (“Warning,” “Caution,” or “Danger”).
  - 2) Name of product.

## DOT Hazard ID Sources.

### Orange Panels



Hazard Identification Code

DOT/UN Identification Number

### Radioactive Labels



### Pipeline Markers



#### 4. Assessment Sources.

- a. NFPA 704 warning system.
  - 1) Colored quadrants identify type of hazard.
    - a) Health (Blue).
    - b) Flammability (Red).
    - c) Instability (Yellow).
    - d) Special Hazards (No special color, usually white).
  - 2) Numerical rating scale shows degree of severity. “0” = minimal hazard. “4” = severe hazard.
  - 3) See detailed information at the end of this module.
- b. Pesticide and/or consumer product labeling must include:
  - 1) Common or usual name or the chemical name. (Consumer products.) Ingredient statement (pesticides).
  - 2) Signal words. (Consumer products & pesticides.)
    - a) “Poison” — substances that are highly toxic.
    - b) “Danger”— substances which are extremely flammable, corrosive, or highly toxic.
    - c) “Warning”—moderate hazard.
    - d) “Caution”—lowest hazard.
  - 3) Statement of the principal hazard or hazards, such as “Flammable”, “Combustible”, “Vapor Harmful”, “Causes Burns”, “Absorbed Through Skin”, or similar wording describing the hazard. (Consumer products.)
  - 4) Precautionary statements for human hazards. (Pesticides.)  
*(Detailed info at the end of this chapter.)*

# Pesticide Label. (40 CFR 156)

**12. Precautionary statements**  
**13. Hazards to humans and domestic animals**  
**10. Statement of practical treatment**  
**11. Note to physician**  
**9. Signal word**  
**16. Directions for use**  
**1. Product name**  
**8. Keep out of reach of children**  
**3. Ingredient statement**  
**2. Type of pesticide**

**EZD-Pest Insecticide and Fungicide**  
**SHAKE WELL BEFORE USING**

**STATEMENT OF PRACTICAL TREATMENT**— If in eyes, flush with plenty of water. Call a physician. If on face, flush with plenty of soap and water. Get medical attention if irritation persists. If swallowed, drink promptly a large quantity of milk, egg whites, or other liquids, or if these are not available, drink large quantities of water. Avoid alcohol. If inhaled, remove victim to fresh air, first breathing pure artificial respiration, preferably from a tank. Get medical attention. **NOTE TO PHYSICIAN**— Conazole is a moderate to severe cholinesterase inhibitor. Atropine, neostigmine. Emergency medical information call 1-800-732-0293.

**PRECAUTIONARY STATEMENTS—HAZARDS TO HUMANS AND DOMESTIC ANIMALS**— **DANGER**— Causes irreversible eye damage. Harmful if swallowed or inhaled. May cause allergic skin reactions. Do not get in eyes. Wear goggles or face shield when handling. Avoid contact with skin and clothing. Wear chemical resistant gloves. Remove long pants and long sleeved shirt and apply with the wind in your back. Wash nondegradable gloves thoroughly with soap and water before removing. Clothing worn while handling this product must be laundered separately from other clothing before reusing.

**ENVIRONMENTAL HAZARDS**— This pesticide is toxic to fish, aquatic invertebrates, and aquatic life stages of amphibians. Do not apply directly to water. Do not use in or near flowing or stagnant water. Do not apply near the application site. Do not cause equipment or deposits of equipment washwaters in a manner that will contaminate water resources. This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

**PHYSICAL OR CHEMICAL HAZARDS**— Do not use or store near heat or open flame. Do not store below 32°F.

**ROSES, EVERGREENS AND FLOWERS**  
**Insects:** Aphids, apple maggot, bagworms, black outworm, bud moth, cherry fruit fly and worms, codling moth, plum curculio, fire beetles, fruit tree leaf miner, gypsy moth, Japanese beetle, leaf hoppers, lesser peach tree borer, mealy bugs, minute jellies, European red, saw spotted and Wilmeth, oriental fruit moth, pear slug, psylla, red banded leaf miner, sawe Phoebe, Pflanz, San-Jose, spruce bug, tent caterpillars, unsuppressed fallow leaf miner, and yellow neck caterpillar.  
**Diseases:** Blister net, black spot, black rot, blossom blight, Botrytis/Phytophthora rot, botrytis blossom and rot, brown rot, corymbium blight, downy mildew, fly speck, frog eye, leaf spot, scab, and sooty blotch.

**MIX (4 TABLESPOONS PER GALLON OF WATER)**  
 Begin applications when pests or disease symptoms first appear or conditions favor their development and repeat at weekly intervals or as necessary to maintain control. Remember, it is easier to prevent damage than to cure it. Therefore, a preventive spray schedule is recommended. Do not use if rain is expected shortly after application. Select still periods for application (early morning or evening) to reduce wash by slow spray and slow back application. Spray in early morning or in the evening to avoid direct sunlight. Do not spray through any type of irrigation equipment.

**STORAGE AND DISPOSAL**  
**STORAGE**— Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Avoid contamination of food and feedstuffs. Store in a cool, dry place, preferably in its labeled storage area.  
**DISPOSAL**— PRODUCT—Empty container should be rinsed and discarded in trash. **CONTAINER**—Do not reuse empty bag, filter thoroughly before discarding in trash.

**NOTICE:** Buyer assumes all responsibility for safety and use not in accordance with directions.

**EZD-Pest Insecticide and Fungicide is a complete concentrate containing fungicide, acaricide, miticide, scabicide and spider-killer. Easy to use, mixes with water instantly, no plugging nozzles; no messy powders to handle, measure or mix; no pre-mixing or straining necessary. Designed especially for home garden to protect roses, evergreens and flowers from the ravages of listed insects and diseases.**

**SHAKE PRODUCT THOROUGHLY BEFORE USING.** Contains microscopic particles which settle upon standing and require mixing by agitation. Choose a cool, calm period, preferably early morning or evening. Shake sprayer occasionally or agitate to keep spray particles in suspension during application.

**EZD-Pest**  
**Insecticide and Fungicide**  
**Controls Diseases and Insects on Flowers and Ornamentals**

**ACTIVE INGREDIENTS**  
 Captan ..... 11.70%  
 Related Derivatives ..... 24%  
 Malathion (90-dimethyl dithiophosphate of diethyl mercaptosuccinate) ..... 6.00%  
 Methoxychlor, 1,1,1-trichloro-2,2-bis (p-methoxyphenyl) ethane ..... 12.00%  
 Carbaryl (1-naphthyl-N-methylcarbamate) ..... 0.30%  
**NET INGREDIENTS** ..... 93.70%  
 Contains Potassium Dichloride  
 \*N-(6-chloromethyl)-4-cyclohexene-1,2-dithiolan-2-ylidene  
 \*Equivalent to 10.56% 2,2-bis (p-methoxyphenyl)-1,1,1-trichloroethane and 1.44% of other isomers and related compounds.

**EZD Company**  
 Fargo, ND 58102  
 Made in U.S.A.  
 EPA Reg. No. 999-2500-AA  
 EPA Est. 999-ND-1

**NET CONTENTS 1/2 GAL**

**Keep out of reach of children**  
**DANGER**  
 See back panel for additional precautionary statements

**15. Physical or chemical hazards**  
**14. Environmental hazards**  
**17. Storage and disposal**  
**4. Net contents**  
**6. EPA registration number**  
**7. EPA establishment number**  
**5. Name and address**  
**9. Signal word**

#### 4. Assessment Sources. *(continued)*

- c. CHEMTREC – Chemical Transportation Emergency Center.
  - 1) 24 hour technical information center.
  - 2) Can provide SDS from member companies. Has over 4 million safety data sheets available.
  - 3) Has database of medical experts and toxicologists who can provide advice and emergency medical treatment assistance to on-scene medical professionals treating victim.
  - 4) Can put responders in touch with product specialist(s) from the manufacturer or shipper.
  
- d. Other hazard assessment sources.
  - 1) NIOSH Pocket Guide to Chemical Hazards.
    - a) Source of information on several hundred chemicals/classes for workers, employers, and occupational health professionals.
    - b) Presents key information and data in abbreviated or tabular form for chemicals or substance groupings (e.g. cyanides, fluorides, manganese compounds) found in the work environment.
    - c) Designed to provide chemical-specific data to supplement general industrial hygiene knowledge.
  - 2) Poison Control System. (See facing page.)
  - 3) Infotrac™, ChemTel™ and 3E Company™.
    - a) 24 hour technical information centers.
    - b) Can provide SDSs from member companies.
    - c) Can dispatch member company response teams.

## Off-Site Information Resources

### Chemical Transportation Emergency Center (CHEMTREC)

CHEMTREC serves as a round-the-clock resource for obtaining immediate emergency response information for accidental chemical releases. CHEMTREC is linked to the largest network of chemical and hazardous material experts in the world including chemicals and response specialists, response specialists within the carrier community, public emergency services, and private contractors. Their electronic library has over 4 million SDS on file.

Shippers of hazardous materials use CHEMTREC to comply with U.S. DOT emergency notification regulation. This regulation requires hazmat shippers to provide a 24-hour emergency telephone number on shipping documents that can be called in the event of an emergency involving the hazardous material that was shipped. (49 CFR §172.604). Phone: 800-262-8200 24 hours a day. [www.chemtrec.com](http://www.chemtrec.com)

### California Poison Control System

The California Poison Control System (CPCS) is the statewide provider of immediate free and expert treatment advice. They provide assistance in case of exposure to poisonous, hazardous or toxic substances. Pharmacists, physicians, nurses, and poison information providers staff all answering sites. Phone: 1-800-222-1222. [www.calpoison.org](http://www.calpoison.org)

## 5. DOT Emergency Response Guidebook (ERG).

- a. ERG purpose: *Basic* safety tool for *basic* identification, *basic* assessment and *initial* response (recognized good practice/standard for FRAs to follow).
  - 1) Use current version for transportation-related Hazmat incidents!
  - 2) Use current SDS (if available) for other incidents.
- b. ERG page border colors and basic organization:
  - 1) **White** - Basic information and instructions.
    - a) Table of Placards (pages 8-9).
    - b) Rail Car Identification Chart (pages 10-12).
    - c) Road Trailer Identification Chart (pages 13-15).
    - d) Intermodal Container Hazard ID Numbers (pages 18-21).
    - e) Pipeline Information (pages 22-27).
  - 2) **Yellow** – ID number index (materials listed by ID number).
  - 3) **Blue** - Material name index (materials listed alphabetically).
  - 4) **Orange** – Numbered guide pages.
  - 5) **Green** - Initial Isolation & Protective Action Distances.
    - a) Table 1, Toxic Inhalation Hazards (pages 290-333)).
    - b) Table 2, Water-Reactive Materials (pages 334-339).
    - c) Table 3, Six Common TIH Gases (pages 340-343).
  - 6) **White** - Basic information and instructions (continued).
    - a) BLEVE Safety Precautions (pages 357-359).
    - b) Glossary (pages 369-379).

# Emergency Response Guidebook Exercise.

## White Pages (Pages 8-15)

Identify the material(s) and find the proper Guide page for this material.

Recognition Clue	Guide #	Major Hazard
Blue Placard	_____	_____
Green Placard	_____	_____
Box Car	_____	_____
Intermodal Container	_____	_____

## Hazard Identification Numbers (Pages 18-21)

Find the hazards associated with the following numbers.

Number	Hazard(s)
55	_____ _____
X80	_____ _____
382	_____ _____
63	_____ _____

## 5. DOT Emergency Response Guidebook (ERG). *(cont.)*

- c. ERG is a good user-friendly basic guide *but is limited*:
  - 1) Classifies by major hazard class or general chemical family.
  - 2) *Guides are general guidance with specific recommendations for some hazards.*
    - a) General: Guide 111.
    - b) Specific: “P” – Polymerization hazard.
    - c) List of Dangerous Water–Reactive Materials.
  - 3) Isolation and evacuation distances in back of book are guides.
  - 4) Use table of placards only if materials cannot be identified.
  - 5) Intended for use in transportation-related incidents.
  - 6) Intended only for use in “initial response phase” of incident.
- d. Responders should have ready access to an ERG and other guides, and *must know how to efficiently and effectively use it.*

## Emergency Response Guidebook Exercise.

### ID Number

Use the ERG to identify the material associated with this ID number and find the proper Guide page for this material.

ID #	Name	Guide #	Major Hazard(s)
3065	_____	_____	_____
1365	_____	_____	_____
3171	_____	_____	_____
1356	_____	_____	_____

### Material Name

What is the protective action distance for a large spill that occurs at night (light winds, no fire)? Identify any special hazards.

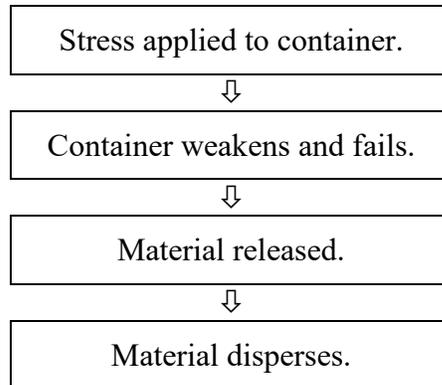
Name	Distance/Special Hazards
Ammonia, Anhydrous	_____
Butyl Acrylate	_____
Nitric Acid, Red Fuming	_____
Acetic Anhydride	_____
Aluminum Phosphide Pesticide	_____
Sarin	_____

## 6. Container System Stress and Behavior.

- a. Hazmats are released when their containment system fails.
  - 1) Container failure can be minor (e.g. leaking can of paint thinner) or catastrophic (e.g. BLEVE).
  - 2) Nature of failure determines immediate potential harm.
    - a) Kingman BLEVE versus Tokyo Sarin release.
- b. Hazmat release process.
  - 1) Stress on container.
  - 2) Container weakens and fails.
  - 3) Material released.
  - 4) Material disperses.
  - 5) ***Hazard to you depends on what step the process is on when you arrive!***
- c. Types of container stress. (Can occur individually, in combination or in sequence.)
  - 1) Thermal (hot or cold).
  - 2) Mechanical.
  - 3) Chemical.
- d. Evaluating container stress. (If something bad *might* happen, how much time do I have before it *does* happen?)
  - 1) What type of stress is the container subjected to?
  - 2) What will the container likely do? (BLEVE?)
  - 3) When will it likely do it?
- e. Action planning for FRAs.
  - 1) Pay attention to container stresses.
  - 2) Follow ERG recommendations.

## Evaluating Container Stress

*Steps* Container failure process.



*Hierarchy* Evaluating risk from container stresses.

<b>Situation</b>	<b>Risk to Responders</b>
Damaged pressurized container with flame impingement, Pressure relief valve is operating.	Immediately Dangerous
Pressurized container with flame impingement.	Immediately Dangerous
Damaged pressurized container.	Dangerous
Pressurized containers that have been otherwise stressed.	Cause for Concern
Any container exposed to temperature extremes (hot <i>or</i> cold).	Cause for Concern
Any container exposed to any other form of stress.	Cause for Concern

## 6. Container System Stress and Behavior. *(continued)*

- f. Types of container failure.
  - 1) Catastrophic. (Total loss of container integrity.)
  - 2) Fracture. (Crack, tear or split seam.)
  - 3) Puncture. (Hole in container caused by mechanical stress.)
  - 4) Degradation. (Corrosion from excessive rust or exposure to corrosive substances.)
  
- g. Types of product dispersion.
  - 1) Instantaneous release.
    - a) Gases and liquids will spread rapidly in all directions.
    - b) Flammable gases and liquids may ignite immediately.
  - 2) Rapid release.
    - a) Gases will spread rapidly downwind.
    - b) Liquids will spread rapidly downgrade.
    - b) Flammable gases and liquids may ignite quickly.
  - 3) Slow release.
    - a) Gases will spread slowly downwind.
    - b) Liquids will spread slowly downgrade.
    - b) Flammable gases and liquids may ignite.
  
- h. Boiling-Liquid Expanding Vapor Explosion (BLEVE).
  - 1) Cause: Thermal stress on pressure vessel.
    - a) Thermal stress weakens container.
    - b) Container breaches.
    - c) Product released nearly instantaneously.
  - 2) Hazards: Flying debris from ruptured container. Large fireball when expanding vapor ignites.
  - 3) Timeframe: Can occur in *less than* 10 minutes.

## Special Hazard—BLEVE.

- Basics* Thermal stress on a container can cause an extremely hazardous event known as a Boiling Liquid Expanding Vapor Explosion (BLEVE). This occurs when a liquid or liquefied gas within a container is heated to a temperature well above its boiling point at atmospheric temperature. The increase in pressure causes the container to rupture catastrophically. When the container breaches the pressure in the container drops suddenly. The sudden drop in pressure inside the container causes the volatile liquid to expand rapidly generating a large amount of vapor. This sometimes happens with tremendous force. A BLEVE can occur when fire impinges on the container at a point or points above the liquid level of the contents of the container. This flame impingement causes the metal to weaken and fail from the internal pressure.
- Hazards* BLEVE hazards can include fireballs, blast effects, projectiles and possible toxic clouds or vapor cloud explosions. BLEVEs of large containers can cause large pieces of debris to travel nearly one mile. These events have caused deaths hundreds of feet away from the source of the explosion. If the liquid in the container is flammable, the rapid expansion of the vapor can cause a fireball that may be hundreds of feet in diameter. *A BLEVE is one of the most dangerous events an emergency responder can face.*
- Cause* A BLEVE can occur in a vessel that stores a substance that is usually a gas at atmospheric pressure but is a liquid when pressurized (for example, liquefied petroleum gas). The substance is usually stored partly in liquid form, with a gaseous vapor above the liquid filling the remainder of the container.
- ERG*** See pages 357-359.

## 6. Container System Stress and Behavior. *(continued)*

- i. Rating risks.
  - 1) Low, Moderate, High or Unacceptable.
  - 2) Related to amount of material involved, physical state of material, container stress, properties of material and potential exposures (i.e. people, environment and/or property).
  - 3) Low risks.
    - a) Small quantities.
    - b) Inert solid materials.
    - c) Undamaged container.
  - 4) Moderate risks.
    - a) Smaller quantities.
    - b) Low vapor-pressure liquid materials.
    - c) Undamaged or slightly damaged container.
  - 5) High risks.
    - a) Larger quantities or multiple containers.
    - b) Moderate vapor-pressure liquid materials or gases.
    - c) Slightly or moderately damaged container.
  - 6) Unacceptable risks.
    - a) Larger quantities and/or gas cylinders involved.
    - b) High vapor-pressure liquids, gases, explosives and/or reactive materials.
    - c) Visibly stressed container and/or flame impingement on a gas cylinder.
    - d) An unacceptable risk where I work is:  

---

## Unacceptable Risks.

Large quantity of gas cylinders



Explosive/reactive materials



Polymerization hazard

**“POL” “130P”**

Visibly stressed containers



## 7. IDHA Complications.

- a. Many variables will affect hazard assessment and may significantly influence the behavior of the material.
  - 1) Location will determine how material will disperse and what it will affect.
    - a) Liquids and most vapors usually go downhill.
    - b) Buildings can trap contaminants and cause unpredictable shifts in wind direction and speed.
  - 2) Time/date will affect evaporation rate and potential for flammability or reactivity (liquids evaporate faster on hot days/during the day, slower on cold days/at night).
  - 3) Weather will affect how material will disperse and where it will go (and where it will end up).
    - a) Gases and vapors usually travel downwind.
    - b) Vapor clouds may take longer to disperse in cold temperatures.
  - 4) Nature of materials (Bad stuff? How bad?).
  - 5) Type of release. (Slow leak, large leak or instantaneous release.)
  - 6) Size of problem (Bad stuff? How much?).
  - 7) Type, condition, nature and behavior of container.
  - 8) Reactivity and combustion.
    - a) Chemicals can react with each other or burn and produce toxic substances.
    - b) This may be difficult or impossible to predict. (Table 2 of ERG green section can help.)
- b. The same material with different variables may significantly change the incident and the way you respond to it.
- c. You may not find the answer in a book—use your head!

## IDHA Complications.

- Wind* Very low wind speeds can make it difficult to predict where and how far a vapor or gas will spread. Generally, wind direction is least predictable and most variable when wind speed is low.
- Stability* Atmospheric stability determines how quickly a vapor or gas cloud will disperse. Under the most stable atmospheric conditions (usually at night), there is usually very little wind and almost no mixing of the pollutant cloud with the surrounding air. Gas concentrations within the cloud can remain high far from the source. The cloud spreads slowly, and high gas concentrations may build up in valleys or depressions and remain for long periods of time, even at distances far from the release point.
- Terrain* The wind typically shifts speed and direction as it flows up or down slopes, between hills or down into valleys, turning where terrain features turn. In urban areas, wind flowing around large buildings forms eddies and changes direction and speed, significantly altering a cloud's shape and movement. Through streets bordered by large buildings can generate a "street canyon" wind pattern that constrains and funnels a dispersing cloud.
- Fires/Reactions* The smoke from a fire, because it has been heated, rises before it moves downwind carrying contaminants with it. In addition, many chemicals react with dry or humid air, water, other chemicals, or even themselves. Because of these chemical reactions, the chemical that disperses downwind might be very different from the chemical that originally escaped from containment. In some cases, this difference may be substantial enough to make computer dispersion predictions inaccurate.

## NFPA 704 Warning System

- Background* The Standard System for the identification of the fire hazards of materials was first adopted by the NFPA in 1961. The purpose of the standard is to safeguard the lives of those individuals who may be concerned with fires or emergencies occurring in an industrial plant or storage location where the hazards of materials on-site may not be readily apparent.
- Applicability* Applies to facilities that manufacture, store or use hazardous materials.
- Purpose* Provides a simple system of readily recognizable and easily understood markings which will give, at a glance, the general idea of the inherent hazards of any hazardous material.
- Components* Identifies the hazards of a material in terms of three principal categories: Health, Flammability and Reactivity.
- Indicates order of severity numerically by five divisions ranging from four (4), indicating a severe hazard, to zero (0), indicating no special hazard.
- Presents information by a standard pattern of diamond shapes and colors. Health (blue), left; Flammability (red), top; top; Instability (yellow), right. Note: Yellow was changed from “Reactivity” to “Instability” in 1996.
- The bottom space indicates unusual hazards such as reactivity with water, oxidizing properties or radioactivity.

## Health Hazard – Blue

Signal	Type of Possible Injury
4	Materials which on very short exposure could cause death or major residual injury even though prompt medical treatment were given.
3	Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment were given.
2	Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.
1	Materials which on exposure would cause irritation but only minor residual injury even if no treatment is given.
0	Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material.

## Flammability – Red

Signal	Type of Possible Injury
4	Materials which will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or which are readily dispersed in air and which will burn readily.
3	Liquids or solids that can be ignited under almost all ambient temperature conditions.
2	Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
1	Materials that must be preheated before ignition can occur.
0	Materials that will not burn.

### Instability – Yellow

Signal	Type of Possible Injury
4	Materials which are readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
3	Materials which are capable of detonation or explosive reaction but require a strong initiating source or which must be heated under confinement before initiating or which react explosively with water.
2	Materials which are normally unstable and readily undergo violent chemical change but do not detonate. Also, materials which may react violently with water or which may form potentially explosive mixtures with water.
1	Materials which are normally stable but which can become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently.
0	Materials which are normally stable, even under fire exposure conditions, and which are not reactive with water.

### Special Hazards – White

Signal	Type of Possible Injury
<b>POL</b>	Polymerization hazard.
<b>COR</b>	Corrosive hazard.
<b>W</b>	Use no water.
<b>OX</b>	Oxidization hazard.
	Radiation hazard.

## Pesticide Label Info.

- Availability*      **“A copy of the registered labeling that allows the manner in which the pesticide is being used shall be available at each use site.”** (Title 3 CCR §6602)
- Placement*      “The label shall appear on the pesticide or the immediate container thereof. If the immediate container is enclosed within a wrapper or outside container through which the label cannot be clearly read by a person with normal vision, the label must also appear on such outside wrapper or container if it is a part of the retail package.”  
(Title 3 CCR §6237)
- Statements*      “Warning or caution statements...must appear on the label in a place sufficiently prominent to warn the user, and must state clearly and in nontechnical language the particular hazard involved in the use of the pesticide, e.g., ingestion, skin absorption, inhalation, flammability or explosion, and the precautions to be taken to avoid accident, injury, or damage.”
- (a) The label of every pesticide shall bear warnings or cautions which are necessary for the protection of the public, including the statement, “Keep out of reach of children,” and a signal word such as “Danger,” “Warning,” or “Caution” as the director may prescribe, on the front panel or that part of the label displayed...
- (b) The label of every pesticide which is highly toxic to man shall bear the word “Danger” along with the word “Poison” in red on contrasting background in immediate proximity to the skull and crossbones, and an antidote statement including directions to call a physician immediately on the front panel or that part of the label displayed...”(Title 3 CCR §6242)

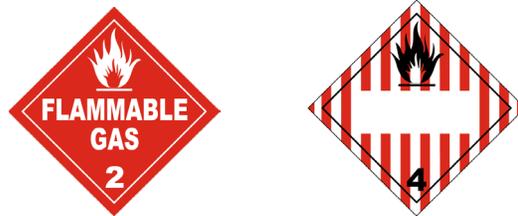
## Module Review – DOT ERG Exercise

Problem #1 The placard on the side of a tank car looks like this:



What Guide # would you choose?

Problem #2 The placards on the side of a tank car look like this:



What Guide # would you choose:

Problem #3 You arrive at the scene of an overturned truck. The placards on the side of the truck look like this:



What Guide # would you choose?

## Chapter F

### *Putting it all Together and Graduation*

#### Main Points

- Course Purpose & Content
- How This Fits Together
- Know Your Limitations
- Course Evaluation
- Concluding Remarks

## Chapter Outline

### 1. Course Purpose and Key Course Content.

- a. Course Purpose: Be a safe & competent responder within your appropriate level, resources and capabilities!
- b. Key course content: Review performance objectives.
- c. Know “Dos” for FRAs.
- d. Review final exam (as needed).

### 2. How This All Fits Together.

- a. First Responder “Awareness”: **S.I.N.**
- b. **F**aithfully **R**espond to any Hazmat event **S**afely, **C**ompetently and **E**ffectively. (FARSCE — the final acronym in this class!)

### 3. Know Your Limitations.

- a. You are at the First Responder Awareness level:
  - 1) Know your real resources and capabilities.
- b. You are not a Technician or Specialist:
  - 1) “A little bit of knowledge can be more dangerous than none.”

## First Responder Course Key Points.

- DO Recognize your level and role in a Hazmat response.
- DO Understand the capabilities and limits of responders.
- DO Make proper notifications and requests for aid.
- DO Understand Hazmat is a multi-agency response.
- DO Understand need to coordinate with those agencies.
- DO Appreciate need for pre-event & event planning.
- DO Recognize that toxicology is deadly important.
- DO Demand response is safe via isolation & perimeters.
- DO Assume command, set unified CP & use ICS.
- DO A complete identification and hazard assessment.
- DO Ensure proper safety equipment for responders.
- DO Try for safe containment and protective actions.
- DO Proper decon, clean-up and disposal.
- DO Maintain good documentation and reporting.
- DO Know the hazmat laws and points of liability.
- DO Recognize the need for investigations during response.
- DO Strive for increased competence and safety.
- DO Use the tools of training, exercising and critiques.
- DO Be careful and competent out there!

#### **4. Complete Verbal and Written Class Evaluation.**

- a. Please candidly identify what was positive about class, and more importantly, what we can do to better meet your training needs.
- b. We want your constructive comments.

#### **5. Concluding Remarks.**

- a. Make a positive difference in responding to Hazmat events!
- b. Be part of the solution — Not part of the problem!
- c. And don't forget: *Let's be careful and competent out there!!!*

# Congratulations!

