

ANALYZING THE INCIDENT

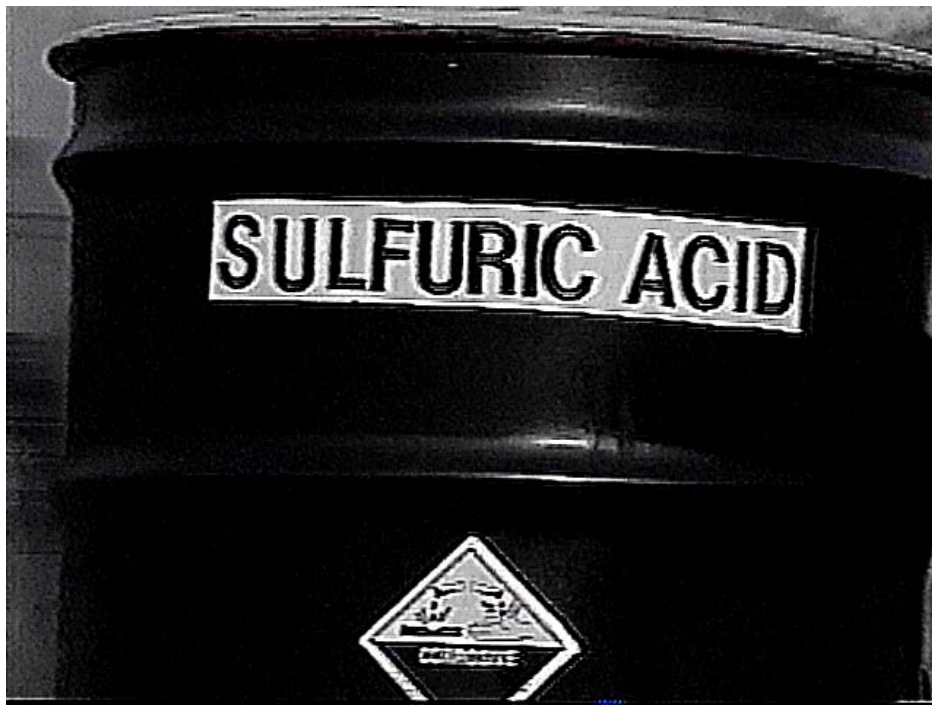
MODULE I

INTRODUCTION (4.1.1)

Emergency responders at the awareness level shall be trained to meet all competencies of NFPA 472 Chapter 4. In addition, awareness level responders shall receive training to meet applicable United States Department of Transportation (DOT), Environmental Protection Agency (EPA), and Occupational Safety and Health Administration (OSHA) requirements.

DEFINITION

First responders at the awareness level are persons who, in the normal course of their duties, could be the first on scene of an emergency involving hazardous material. They are expected to recognize the presence of hazardous materials, protect themselves, call for trained personnel, and secure the area.



GOAL (4.1.2)

The goal of the competencies at the awareness level shall be to provide first responders with the knowledge and skills necessary to perform the following tasks safely. Therefore, when first on the scene of an emergency involving hazardous material, the first responder at the awareness level shall be able to:

(a) **Analyze the incident** to determine both the hazardous materials present and the basic response information by completing the following tasks:

1. *Detect* the presence of hazardous materials.
2. *Survey* a hazardous materials incident, from a safe location, to identify the name, United Nations/North American (UN/NA) identification number, or type placard applied for any hazardous materials involved.
3. *Collect* hazard information from the current edition of the Emergency Response Guidebook (ERG).

(b) **Implement** actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of the ERG by completing the following tasks:

1. *Initiate* protective actions.
2. *Initiate* the notification process.



DETECTING THE PRESENCE OF HAZARDOUS MATERIALS (4.2.1)

The first responder at the awareness level shall, given various facility and/or transportation situations or both, with and without hazardous materials present, identify those situations where hazardous materials are present.

- (a) ***Hazardous Materials*** as defined by the DOT is one that poses an unreasonable risk to the health and safety of operating or emergency personnel, the public, and/or the environment if it is not properly controlled during handling, storage, manufacture, processing, packaging, use, disposal, or transportation. It covers all of the hazard classes/divisions.
- (b) ***Hazardous Substances*** EPA term for chemicals that, if released into the environment above a certain amount, must be reported and, depending of the threat to the environment, federal involvement in handling the incident can be authorized.
- (c) ***Extremely Hazardous Substances*** EPA term for chemicals that must be reported to the appropriate authorities if released above the threshold reporting quantity.
- (d) ***Toxic Chemicals*** EPA term for chemicals whose total emissions or release must be reported annually by owners and operators of certain facilities the manufacture, process, or otherwise use a listed toxic chemical.
- (e) ***Hazardous Wastes*** EPA term for chemicals that are regulated under the Resource, Conservation, and Recovery Act.
- (f) ***Hazardous Chemicals*** OSHA term that denotes any chemical that would be a risk to employees if exposed in the work place.
- (g) ***Dangerous Goods*** In Canadian Transportation, hazardous materials are called dangerous goods.
- (h) ***Highly Hazardous Chemicals*** OSHA term for those chemicals that fall under the requirements of 29 CFR 1910.119, "Process Safety Management of Highly Hazardous Chemicals." They possess toxic, reactive, flammable, or explosive properties

IDENTIFY THE DOT HAZARD CLASSES AND DIVISIONS WITH EXAMPLES, PRIMARY HAZARDS AND ASSOCIATED PLACARDS AND LABELS (4.2.1(1))

- * The DOT has classified hazardous materials according to their primary danger and assigned standardized symbols to identify the classes.
- * Materials are grouped by their major hazardous characteristic and many materials will have other hazards as well. Example: A material may be poisonous, corrosive and flammable but will only be grouped with whichever is considered the worst.

Class 1 (Explosives)

Major Hazard: Explosion

1. Definition - Explosive means any substance or article, including a device that is designed to function by explosion (i.e. release of gas and heat) or that, by chemical reaction within itself is able to function by explosion.

- (a) Division 1.1 - Explosives that have a mass explosion affects almost the entire load instantaneously.
 - **Black Powder**
 - **Dynamite**
 - **T-N-T**
 - **Blasting caps**
 - **Nitroglycerin**
- (b) Division 1.2 - Explosives that have a projection hazard but not a mass explosion hazard.
 - **Projectiles with bursting charges**
 - **Aerial flares**
 - **Detonation cord**
 - **Power device cartridges**

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- (c) Division 1.3 - Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard, or both, but not a mass explosion hazard.
- **Liquid-fueled rocket motors**
 - **Propellant explosives**
 - **Special fireworks**
- (d) Division 1.4: Explosive devices that present a minor explosion hazard. No device in the division may contain more than 25 grams (0.9 oz) of a detonating material. The explosive effects are largely confined to the package and no projections of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.
- **Practice ammunition**
 - **Common fireworks**
 - **Signal cartridges**
- (e) Division 1.5 - Very insensitive explosives - substances that have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.
- **Prilled ammonium nitrate fertilizer**
 - **Fuel oil mixtures**
 - **Blasting agents**
- (f) Division 1.6 - Extremely insensitive articles that do not have a mass explosive hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and that demonstrate a negligible probability of accidental initiation or propagation.
- **Explosive squib devices**

Placards - Orange, Bursting Ball with word “Explosives” or “Blasting Agents” - (1.5)

Class 2 (Compressed gas)

Major Hazards: BLEVE (Boiling Liquid Expanding Vapor Explosion)

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- **Sub-hazards: Flammable,**
- **Oxidizer**
- **Poisonous**
- **Corrosive**

(a) Division 2.1 - (Flammable gas) means any material that is a gas (boiling point) at 68⁰F or less and 14.7 psi of pressure, and a material that has a boiling point of 68⁰F or less at 14.7 psi and that:

1 Is ignitable at 14.7 psi when in a mixture of 13% or less by volume with air; or

2 Has a flammable range at 14.7 psi with air of at least 12% regardless of the lower limit

- **Inhibited butadienes**
- **Methyl chloride**
- **Propane**
- **Methane**
- **Hydrogen**

b) Division 2.2 - (Nonflammable, nonpoisonous Compressed Gas, Including Compressed Gas, Liquefied Gas, Pressurized Cryogenic Gas, and Compressed Gas in solution) A nonflammable, nonpoisonous compressed gas means any material (or mixture) that exerts in the packaging an absolute pressure of 280 kPa (41psia) at 200C (68°F). A cryogenic liquid means a refrigerated, liquefied gas having a boiling point colder than ~90 C (~130°F) at 101.3 kPa (14.7 psi) absolute.

- **Anhydrous ammonia**
- **Cryogenic argon**
- **Carbon dioxide**
- **Compressed nitrogen,**
- **Neon**
- **Helium**

c) Division 2.3 - (Poisonous Gas, toxic by inhalation) means gases that vaporize easily, that are very dangerous to life, even in small amounts. A material that is a gas at 200C (68°F) or less and a pressure of 101.3 kPa (14.7 psi or 1 atm), a material that has a boiling point of 200C (68°F) or less at 101.3 kPa (14.7 psi), and that:

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1 Is known to be so toxic to humans as to pose a hazard to health during transportation; or

2 In the absence of adequate data on human toxicity, it is presumed to be toxic to humans because, when tested on laboratory animals, it has an LC50 value of not more than 5,000 ppm.

- **Anhydrous hydrogen fluoride**
- **Arsine**
- **Chlorine**
- **Diphosgene**
- **Methyl bromide**

(d) Division 2.4 - Corrosive gases (Canada)

Placards

Flammable - Red background, White Flame

Non-Flammable - Green background, White Cylinder

Oxidizer - Yellow background, Flaming "O"

Poison Gas - White background, Skull & Crossbones

Class 3 - Flammable and Combustible liquids

Major Hazard: Burns readily

(a) Definition - (flammable liquid) any liquid having a flash point of not more than 60.5°C (141°F)

1 Division 3.1 - Flash point <0°F

2 Division 3.2 - Flash point 0°F to 73°F

3 Division 3.3 - Flash point 73°F to 141°F

- **Acetone**
- **Amyl acetate**
- **Gasoline**
- **Methyl alcohol**
- **Toluene**

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(b) Definition - (combustible liquid) any liquid that does not meet the definition of any other hazard class and has a flash point above 60°C (140°F) and below 93°C (200°F)

- **Mineral oil**
- **Peanut oil**
- **No. 6 fuel oil**
- **Pine oil**
- **Plastic solvents**

* Flammable liquids with a flash point above 38°C (100°F) may be reclassified as a combustible liquid.

Placards

Flammable - Red background, White Flame w/the word “Flammable”

Combustible - Red background, White Flame w/the word “Combustible”

Class 4 - Flammable Solids

Major Hazard: Rapid combustion with liberation of mass quantities of smoke

(a) Division 4.1 - (Flammable Solid) means any of the following three types of materials

1 Wetted explosives - explosives wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties

2 Self-reactive materials - materials that are liable to undergo, at normal or elevated temperatures, a strongly exothermic decomposition caused by excessively high transport temperatures or by contamination.

3 Readily combustible solids - solids that may cause a fire through friction and any metal powders that can be ignited.

- **Magnesium (pellets, turnings, or ribbons)**
- **Nitrocellulose**
- **Safety matches**
- **Sulfur.**

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- (b) Division 4.2 - (Spontaneously Combustible Material) consist means any of the following materials

1 Pyrophoric Material - a liquid or solid that, even in small quantities and without an ignition source, can ignite within 5 minutes after coming in contact with air.

2 Self-heating material - a material that, when in contact with air and without an energy supply, is liable to self-heat.

- **Aluminum alkyls**
- **Charcoal briquettes**
- **Magnesium alkyls**
- **Phosphorus**

- (c) Division 4.3 - (Dangerous When Wet Materials) means a material that, by contact with water, is liable to become spontaneously flammable or to give off flammable or toxic gas at a rate greater than 1 L/kg of the material, per hour.

- **Calcium carbide**
- **Magnesium powder**
- **Potassium metal alloys**
- **Sodium hydride**

Placards

Division 4.1 - Red and White Vertical Stripes, Black Flame and the words "*Flammable Solid*"

Division 4.2 - White Top, Red Bottom, Black Flame with words "*Spontaneously Combustible*"

Division 4.3 - Blue background, White Flame, words "*Dangerous when Wet*"

Class 5 - Oxidizers

Major Hazards 5.1: Supports Combustion, intensifies fire

Major Hazards 5.2: Unstable/Reactive Explosives

- (a) Division 5.1 - (Oxidizer) means a material that may, generally by yielding oxygen, cause or enhance the combustion of other materials

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- **Ammonium nitrate**
- **Bromine Trifluoride**
- **Calcium hypochlorite**
- **Chlorate**
- **Permanganate.**

(b) Division 5.2 - (Organic Peroxide means an organic compound containing oxygen (O) in the bivalent [O-O] structure that may be considered a derivative of hydrogen peroxide, where one or more of the hydrogen atoms have been replaced by organic radicals. Materials are assigned to one of seven types.

1 Type A - can detonate or deflagrate rapidly as packaged for transport. Transportation of type A organic peroxides is forbidden.

2 Type B - neither detonates nor deflagrates rapidly, but that can undergo a thermal explosion.

3 Type C - neither detonates nor deflagrates rapidly and cannot undergo thermal explosion.

4 Type D - detonates only partially or deflagrates slowly, with medium to no effect when heated under confinement.

5 Type E - neither detonates nor deflagrates and shows low, or no, effect when heated under confinement.

6 Type F - will not detonate, does not deflagrate, shows only a low, or no, effect if heated when confined, and has low or no explosive power.

7 Type G - will not detonate, does not deflagrate, shows no effect if heated when confined, and has no explosive power, is thermally stable, and is desensitized.

- **Dibenzoyl peroxide**
- **Methyl ethyl ketone peroxide**
- **Peroxyacetic acid**

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Placards

5.1 - Yellow background, Black Flaming "0" with word "Oxidizer"

5.2 - Yellow background, Black Flaming "0" with words "Organic Peroxide"

Class 6 (Poison)

Major Hazards: Toxicity, Infectious

- (a) 6.1 - Poisonous Materials means a material, other than a gas, that is either known to be so toxic to humans as to afford a hazard to health during transport **OR** in the absence of adequate data on human toxicity, is presumed to be toxic to humans, including irritating materials that cause irritation.

- **Aniline**
- **Carbon Tetrachloride**
- **Parathion**
- **Potassium arsenate**
- **Tear gas**
- **Xylyl bromide**
- **Hydrocyanic acid.**

- (b) 6.2 - Infectious Substance means a viable microorganism, or its toxin that causes or may cause disease in humans or animals. Infectious substance and etiologic agent are synonymous.

- **Anthrax**
- **Botulism**
- **Rabies**
- **Tetanus**
- **Polio virus.**

Placard - White background, Skull and Crossbones

Class 7 (Radioactive)

Major Hazard: Radioactive poisonous burns

Definition - material having a specific activity greater than 0.002 microcuries per gram ($\mu\text{Ci/g}$)

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- **Cobalt**
- **Uranium**
- **Uranium Hexafluoride**
- **“Yellow Cake”**
- **Plutonium**

Placard - Yellow top, White bottom, Black “Propeller”

Class 8 - Corrosives

Major Hazards: burns/emulsification skin damage

(a) Definition - a liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact, or a liquid that has a severe corrosion rate on steel or aluminum

- **Nitric Acid**
- **Phosphorus Trichloride**
- **Sodium Hydroxide**
- **Sulfuric Acid**
- **Ammonium hydroxide.**

Placard - White Top, Black bottom, two test tubes, hand and steel bar

Class 9 - Miscellaneous

Definition - a material that presents a hazard during transport, but that is not included in another hazard class. Also a material that has anesthetic, noxious, or other similar property, that could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties; or one that is not included in any other hazard class, but is subject to the DOT requirements (a hazardous substance or waste).

- (a) Division 9.1 - Miscellaneous Dangerous Goods (Canada)
- (b) Division 9.2 - Environmentally hazardous substances (Canada)
- (c) Division 9.3 - Dangerous wastes (Canada)

- **Adipic acid**
- **PCBs**
- **Molten sulfur**

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- **Hazardous waste**

Placard: Black and white vertical stripes on top, white bottom Other Regulated Materials (ORM-D)

Definition - a material that presents a limited hazard during transportation due to its form, quantity, and packaging.

- **Consumer commodities**
- **Small arms ammunition**
- **Furniture polish**

No placard (labels only)

Forbidden - means prohibited from being offered or accepted for transportation. Does not apply if the materials are diluted, stabilized, or incorporated into devices. There is no placard since they aren't transported.

- 5.2 (a) materials

Marine Pollutant - A material that has an adverse effect on aquatic life.

Elevated Temperature Material - A material is a material that, when offered for transportation in a bulk packaging, meets one of the following conditions:

- a. Liquid at or above 100°C (212°F)
- b. Liquid with a flash point at or above 37.8°C (100°F) that is intentionally heated and is transported at or above its flash point
- c. Solid at a temperature at or above 240°C (464°F)

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Department of Transportation, amendment to 49 CFR Part 171, et al. Hazardous Materials in Intrastate Commerce and Improvements to Hazardous Materials Identification Systems; Final Rules

§ 172.502 Prohibited and permissive placarding.

- (a) ***
 - (2) Any sign, advertisement, slogan (such as “Drive Safely”), or device that, by its color, design, shape or content, could be confused with any placard prescribed in this subpart.
 - (b) ***
- (3) The restrictions in paragraph (a) (2) of this section do not apply until October 1, 2001 to a safety sign or safety slogan (e.g., “Drive Safely” or “Drive Carefully”), which was permanently marked, on or before October 1, 1996, on a transport vehicle, bulk packaging, or freight container.

19. In § 172.504, paragraph (0)(11) is added, and paragraphs (b) and (e) are revised to read as follows:

§ 172.504 General placarding requirements.

b) DANGEROUS placard. A freight container, unit load device, transport vehicle, or rail car which contains non-bulk packages with two or more categories of hazardous materials that require different placards specified in Table 2 of paragraph (e) of this section may be placarded with a DANGEROUS placard instead of the separate placarding specified for each of the materials in Table 2 of paragraph (e) of this section. However, when 1,000 kg (2,205 pounds) aggregate gross weight or more of one category of material is loaded therein at one loading facility on a freight container, unit load device, transport vehicle, or rail car, the placard specified in Table 2 of paragraph (e) of this section for that category must be applied.

(e) *Placarding tables.* Placards are specified for hazardous materials in accordance with the following tables:

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Table 1

Category of material (Hazard class or division number and additional description, as appropriate)	Placard name	Placard reference
		(§)
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 ORGANIC PEROXIDE	
5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled).		172.548
6.1 (PG I, inhalation hazard, Zone A and B)	POISON INHALATION HAZARD	172.552
		172.555
7 (Radioactive Yellow III label only)	RADIOACTIVE I	172.556

Table 2

Category of material (Hazard class or division number and additional description, as appropriate)	Placard name	Placard de sign section reference
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
Combustible liquid	COMBUSTIBLE	172.544
4.1	FLAMMABLE SOLID	172.546
4.2	SPONTANEOUSLY COMBUSTIBLE	172.547
5.1	OXIDIZER	172.550
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled).	ORGANIC PEROXIDE	172.552
6.1 (PG I or II, other than PG I inhalation hazard)	POISON	172.554
6.1 (PG III)	KEEP AWAY FROM FOOD	172.553
6.2	(None)	
8	CORROSIVE	172.558
9	CLASS 9	172.560
ORM-D	(None)	

****NOTE****

Agricultural Exemptions are found in 49 CFR 173.5

Materials of Trade Exemptions are found in 49 CFR 173.6

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

Identify differences between hazardous materials incidents and other emergencies. (4.2.1(4))

- 1) Typical occupancies and locations in the community where hazardous materials are manufactured, transported, stored, used, or disposed of are:
 - (a) Potential for doing great harm since effects are far reaching and severe.
 - (b) Responders must be specifically trained and equipped to deal with them properly.
 - (c) Often have long-term effects to the environment, people and property.

Identify typical occupancies and locations in the community where hazardous materials are manufactured, transported, stored, used, or disposed of. (4.2.1(5))

- (a) Warehouses
 - (b) Tank farms
 - (c) Weapons depots
 - (d) Hospitals
 - (e) Laboratories
 - (f) Truck terminals
 - (g) Flight line
 - (h) Maintenance facilities
- 1) Personnel developing the pre-incident plans should seek assistance from the facility manager in identifying hazardous materials locations and recording them on the plan in a way that will be useful to the first-arriving companies

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

- 2) Hazardous materials that are manufactured, stored, processed, or used at a particular site are NOT subject to regulations affecting transported materials.
- 3) Hazardous occupancies and problem locations should be identified and evaluated during pre-incident planning

**Identify typical container shapes that may indicate hazardous materials.
(4.2.1(6))**

- a) Radioactive
 - 1 Protective overpaks
 - a Cylindrical configuration
 - b Boxlike configuration
 - 2 Casks
 - a Rigid metal packaging up to 50 feet long
 - b Reinforcing rings and cooling fins
- b) Pressurized products
 - 1) Cylinders
 - a Rounded ends
 - b Aerosol containers
 - c Un-insulated cylinders
 - d Cryogenic cylinders (insulated)
 - 2 MC-331 pressure cargo tank trailer
 - a Rounded ends
 - b Highway mode of transportation
 - 3 Pressure tank car

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- a Rounded ends
 - b Heavy dome cover on top
- 4 Tube trailers/tube modules/high pressure tube cars
 - a Several individual cylinders
 - b Cylinders plainly visible from side
- 5 Cryogenics
 - a Tank-within-a-tank or "Thermos bottle" design
 - b Absence of top fittings on most containers
 - c MC-338
 - 1 Absence of top fittings
 - 2 Visible compartment at back
 - 3 Ends are dished and not rounded like cylinders
 - d Cryogenic tank car
 - 1 Long tank car with no top fittings
 - 2 Fittings enclosed in cabinet on side of car
- 6 Corrosives
 - a) Carboys -glass or plastic bottles that may be encased by a protective box
 - b MC-312
 - 1 Long thin tank with visible stiffener rings
 - 2 Working platform on top
 - 3 Ends are not as rounded as the pressure tanks
- 7 Flammable Liquids

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- a Drums
 - b Jeri-cans
 - c MC-306
 - 1 Oval ends
 - 2 Spill rail along top
 - 3 Fittings visible at bottom of the tank when viewed from side
 - d Non-pressure tank car
 - 1 Distinguished by visible fittings
 - 2 Dome on top smaller than dome on pressure car
- 8 Dry Bulk
 - a Pneumatic hopper trailer
 - 1 “V” shaped bottom structures
 - 2 Rounded sides and sloping ends
 - b Pneumatically unloaded hopper car
 - 1 Flat or rounded sides and flat or angular ends
 - 2 “V” shaped structures at bottom

Identify facility and transportation markings and colors that indicate hazardous materials (4.2.1(7))

- a) Placards
 - 1 United Nations class numbers (bottom of placard)
 - 2 Four digit identification numbers on placard or orange panel

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

- 3 Symbols and colors
- 4 Name of material
- b) NFPA 704 markings
- c) Military hazardous materials marking;
 - 1 Class 1, Division 1-Materials that present a mass detonation hazard.
 - 2 Class 1, Division 2-Materials that present an explosion with fragmentation hazard.
 - 3 Class 1, Division 3-Materials with a mass fire hazard
 - 4 Class 1, Division 4-Materials that present a moderate fire hazard.
 - 5 Special warnings
 - a Chemical Hazard
 - 1 Highly Toxic
 - 2 Harassing Agents
 - 3 White Phosphorus Munitions
 - b Apply No Water
 - c Wear Protective Breathing Apparatus
- d) Special hazard communication markings;
 - 1 Hazardous Materials Information System (HMIS)
 - 2 PCB labels
- e) Pipeline marker; - Pipeline markers are usually metal signs placed adjacent to a hazardous materials pipeline right of way. They contain information about:
 - 1 Product and signal word - Caution, Warning, Danger

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- 2 Ownership of the line
- 3 Emergency telephone number
- f) Container markings - Often, markings on a container will provide some indication as to the type of product it holds. These markings include product names, such as "chlorine."

NFPA 704-Suggested method for the identification of hazardous materials (4.2.1(8))

- a) Scale of **0-4**, **4** being the worst possible hazard
- b) Used for facilities only if mandated by local ordinances
- c) Colors and their meaning
 - 1 Health: (Blue)
 - 2 Flammability: (Red)
 - 3 Reactivity: (Yellow)
 - 4 Special: (White) - Special Information
 - a Oxidizer (oxidizing ability)
 - b Radioactive
 - c Avoid use of water

Identify basic information on and entries on material safety data sheets (MSDS) and shipping papers that indicates hazardous materials (4.2.1.(10))

- a) Basic information on MSDS
 - 1 Manufacturers name and location
 - 2 Name and family of chemical

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- 3 Hazardous Ingredients
- 4 Physical Data
- 5 Fire and Explosion Data
- 6 Health Hazard Data
- 7 Spill or Leak Procedures
- 8 Special Protection Information
- 9 Special Precautions

b) Entries on a MSDS

- 1 General Information - includes manufacturer's name, address and emergency phone number, chemical name and family, and all synonyms
- 2 Hazardous Ingredient Statement - breaks out the active ingredients by percentage. Trade secrets restrictions may sometimes minimize the amount of information available on an MSDS, although responders should have access to this data during an emergency.
- 3 Physical Data - includes physical properties.
- 4 Fire and Explosion Data - includes control and extinguishment measures, proper extinguishing agents, etc.
- 5 Spill and Leak Control Procedures - include procedures and precautions for handling chemical releases as well as waste disposal methods.
- 6 Special Protection Information - includes protective clothing and respiratory protection requirements.
- 7 Other Special Precautions (as necessary).
- 8 Health and Reactivity Hazard Data (as necessary) - includes toxicology information, signs and symptoms of exposure, emergency care, chemical incompatibilities, decomposition products, etc.

c) Information on shipping papers

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- 1 Shipper and receivers name and address
- 2 List of shipped materials
- d) Entries on shipping papers that indicate the presence of hazardous materials.
 - 1 Proper shipping name
 - 2 Hazard class or division
 - 3 Product Identification Number
 - 4 STCC Number
 - a 7 digit number that applies to rail only
 - 5 CAS Number (Chemical's social security number)

Identify where to find Material Safety Data Sheets (MSDS) (4.2.1(10)(a))

- a) Why they are necessary
 - 1 Federal hazard communication laws
 - 2 Right to know (Where employees can get to the information easily)
 - 3 Mandatory local communication on hazards
- b) OSHA has required all establishments to keep on file an MSDS for each chemical stored or used on site
 - 1 Central location at facility
 - 2 With facility manager/employer

Match the name of the shipping papers found in transportation (air, highway, rail, water) with the mode of transportation and the person

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

responsible. (4.2.1(10)(c), (d), (e), (f), (g))

- a) Normal location
 - 1 Highway
 - a Called “Bill of Lading”, or “Freight Bill”
 - b Person responsible - driver
 - c Located in cab
 - 2 Rail
 - a Called "Waybill" and "Consist"
 - b Person responsible “Conductor” or “Engineer”
 - c Located in with member of train crew
 - 3 Water
 - a Called "Dangerous Cargo Manifest"
 - b Person responsible “Captain” or “Master”
 - c Located in the wheelhouse or in a tube-like container on a barge
 - 4 Air
 - a Called the "Air Bill”
 - b Person responsible - “Pilot”
 - c Located in the cockpit/flight deck or attached to a package
- b) **During emergencies – shipping papers can be obtained from the shipper/manufacturer or through CHEMTREC**

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

Identify examples of clues (other than occupancy/location, container shape, markings/colors, placards/labels, MSDS, and shipping papers) that use the senses of sight, sound and odor to indicate hazardous materials. (4.2.1(11))

- a) Sight
 - 1 visible corrosive actions
 - 2 chemical reactions
 - 3 pooling liquids
 - 4 condensation lines on pressure tanks
 - 5 injured victims or casualties
 - 6 fire or vapor cloud
- b) Sound - hissing of pressure releases
- c) Odor
 - 1 gas leaks
 - 2 fire or vapor cloud

Describe limitations of using the senses in determining the presence or absence of hazardous materials (4.2.1(12))

- a) close enough to smell - risk of injury
- b) close enough to see - risk of injury
- c) touching may cause injury
- d) taste - not recommended
- e) many gases are odorless, colorless, and tasteless

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

Potential targets for criminal or terrorist activity (4.2.1(13))

Terrorism Definition: The unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. (Code of Federal Regulations, 28 CFR 0.85)

- a) Places of public assembly
- b) Public buildings
- c) Mass transit systems
- d) Places with high economic impact
- e) Telecommunications activities
- f) Places with historical or symbolic significance
- g) Military installations
- h) Airports
- i) Industrial facilities

Describe the difference between a chemical and a biological incident (4.2.1(14))

- a) A chemical incident is characterized by a rapid onset of medical symptoms (minutes to hours) and can have observed signatures such as colored residue, dead foliage, pungent odor, and dead insect and animal life.
- b) With biological incidents, the onsets of symptoms usually require days to weeks and there are typically no characteristic signatures because biological agents are usually odorless and colorless. The area affected can be greater due to the migration of infected individuals because of the delayed onset of symptoms. An infected person could transmit the disease to another person.

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

Identify at least four indicators of possible terrorist or criminal activity involving chemical agents: (4.2.1(15))

- a) Hazardous materials or lab equipment that is not relevant to a location
- b) Intentional releases of hazardous materials
- c) Unexplained patterns of sudden onset illness or death
- d) Unexplained odors or tastes
- e) Multiple individuals with unexplained signs of skin, eye, or airway irritations
- f) Unexplained bomb/munitions-like material, especially if it contains a liquid
- g) Unexplained vapor clouds, mists, and plumes
- h) Multiple individuals exhibiting unexplained health problems such as nausea, vomiting, twitching, tightness in chest, sweating, pin-point pupils (miosis), runny nose (rhinorrhea), disorientation, difficulty breathing, convulsions, or death.
- i) Trees, shrubs, bushes, food crops, and/or lawns that is dead, discolored, abnormal in appearance or withered.
- j) Surfaces exhibiting oily droplets/films and unexplained oily film on water surfaces
- k) Unusual security, locks, bars on windows, covered windows, and barbed wire

Identify at least four indicators of possible terrorist or criminal activity involving biological agents: (4.2.1(16))

- a) Unusual number of sick or dying people or animals
- b) Health care facilities reporting multiple casualties with similar signs or symptoms

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

- c) Unscheduled or unusual spray being disseminated, especially if outdoors during period of darkness

- d) Abandoned spray devices (Devices will have no distinct odors.)

Identify difficulties in determining the names of hazardous materials in both facilities and transportation (4.2.2(1)).

- a) Facilities
 - 1 Placards or labels missing
 - 2 Label or placard may show hazard class or division, and no product identifier
 - 3 Mixed loads of may have only one placard or label
 - 4 Error in placarding or labeling
 - 5 Shipping papers are not accessible

- (b) Transportation
 - 1 Placards or labels missing
 - 2 Placards and labels do not usually list specific product names
 - 3 Mixed loads are not placarded for all items in the shipment
 - 4 Shipping papers may not be available

Identify sources for obtaining the names of UN\NA identification numbers for, or types placard associated with hazardous materials in transportation (4.2.2(2))

- a) Emergency Response Guidebook

- b) Shipping papers

Identify sources for obtaining names of hazardous materials in a facility. (4.2.2(3))

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

- c) Material Safety Data Sheets
- d) Markings on storage containers
- e) Emergency Planning Documents

TABLE 1

Category of material (Hazard class or division number and additional description, as appropriate) Placard name

HAZARDOUS MATERIALS AWARENESS - ANALYZING THE INCIDENT

Placard design
 section
 reference

(§)

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, Type B, liquid <i>or</i> solid, temperature controlled).		
ORGANIC PEROXIDE		172.552
6.1 (inhalation hazard, Zone A or B)	POISON INHALATION HAZARD	172.555
7 (Radioactive Yellow III label only)	RADIOACTIVE 1	172.556

1 RADIOACTIVE placard also required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with § 173.427(a) of this subchapter.

TABLE 2

Category of material (Hazard class or division number and additional description, as appropriate) Placard name

Placard design
 section
 reference

(§)

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
Combustible liquid	COMBUSTIBLE	172.544
4.1	FLAMMABLE SOLID	172.546
4.2	SPONTANEOUSLY COMBUSTIBLE	172.547
5.1	OXIDIZER	172.550
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled).		
ORGANIC PEROXIDE		172.552
6.1 (other than inhalation hazard, Zone A or B)	POISON	172.554
6.2	(None)	
8	CORROSIVE	172.558
9	Class 9 (see § 172.504(f)(9))	172.560
ORM-D	(None)	

(f) *Additional placarding exceptions.* (1)

When more than one division placard is required for Class 1 materials on a transport vehicle, rail car, freight container or unit load device, only the placard representing the lowest division number must be displayed.

(2) A FLAMMABLE placard may be used in place of a COMBUSTIBLE placard on—

- (i) A cargo tank or portable tank.
- (ii) A compartmented tank car which contains both flammable and combustible liquids.

(3) A NON-FLAMMABLE GAS placard is not required on a transport