

STUDENT WORKBOOK

HAZMAT AWARENESS

PRESENTATION:

000000001. General

a. Without reference determine general principles of the First Responder Awareness Level with at least 80% accuracy. **(2-1)**

(1) Introduction - At the awareness level responders must meet all requirements of,

(2-1.1)

(2) Definition - First responders at the awareness level are expected to: _____ call for trained personnel, _____.
(2-1.2)

(3) Goal - The goal of the competencies at the awareness level shall be to provide first responders with the knowledge and skill to perform the following tasks safely. **(2-1.3)**

(a) Detect the presence of hazardous materials. **(2-1.3(a)1.)**

(b) Survey a hazardous materials incident, from a safe location, to identify the name, UN/NA identification number, or type placard applied for any hazardous materials involved. **(2-1.3(a)2.)**

(c) Collect hazard information from the current edition of the Emergency Response Guidebook. **(2-1.3(a)3.)**

(d) Initiate protective actions consistent with the local emergency response plan, the organization's standard operation procedures, and the current edition of the Emergency Response Guidebook. **(2-1.3(b))**

STUDENT STUDY GUIDE
ANALYZING THE INCIDENT

PRESENTATION:

100000002. Competencies - Analyzing the Incident

a. Given various facility and/or transportation scenarios, with and without hazardous materials present, identify those scenarios where hazardous materials are present with at least 80% accuracy. **(2-2.1)**

(1) Identify the definition of hazardous materials (or Dangerous Goods, in Canada). **(2-2.1.1)**

(a) As defined by the U.S. D.O.T: _____

(b) Hazardous Materials:

(c) Hazardous Substances:

(d) Extremely Hazardous Substances:

(e) Toxic Chemicals:

(f) Hazardous Wastes:

(g) Hazardous Chemicals:

(h) Dangerous Goods:

(2)0 DOT Hazard Classes and divisions with examples **(2-2.1.2)**

- D.O.T. 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.

(a) Class 1 (Explosives)

- Major Hazard: _____

1 Definition:

2 Divisions

a 1.1 Explosives that have a _____ hazard. A _____ is one that affects almost the entire load instantaneously.

- Black powder, dynamite, T-N-T, blasting caps, nitroglycerine

b 1.2 Explosives that have a _____ but not a mass explosion hazard.

- Aerial flares, detonation cord, and power device cartridges

c 1.3 Explosives that have a _____ and either a _____ or _____ hazard, or both, but not a mass explosion hazard

- Liquid-fueled rocket motors, propellant explosives

d 1.4 Explosive devices that present a _____. No device in the division may contain more than _____ (0.9 oz) of a detonating material. The explosive effects are largely confined to the package and no projection 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, signal cartridges

e 1.5 Very insensitive explosives. This division is comprised of substances that have a _____ 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, (blasting agents).

f 1.6 Extremely insensitive articles that do not have a _____ . This division is comprised of articles that contain only extremely insensitive detonating substances and that demonstrate a negligible probability of accidental initiation or propagation.

30 Placard:

(b)0 Class 2 (Compressed gas)

- Major Hazards:

- Sub-hazards: Flammable, Oxidizer, Poisonous

1 Divisions

a 2.1 (_____) means any material that is a gas at 20° C (68° F) or less and 101.3 kPa (14.7 psi) of pressure, a material that has a boiling point of 20° C (68° F) or less at 101.3 kPa (14.7 psi) and that:

1 Is ignitable at 101.3 kPa (14.7 psi) when in a mixture of 13% or less by volume with air;
or

2 Has a flammable range at 101.3 kPa (14.7 psi) with air of at least 12% regardless of the lower limit

- Inhibited butadienes, methyl chloride, propane, methane and hydrogen

b0 2.2 (_____) A nonflammable, nonpoisonous compressed gas means any material (or mixture) that exerts in the packaging an absolute pressure of 280 kPa (41 psia) at 20° C (68° F).

A cryogenic liquid means a refrigerated, liquefied gas having a boiling point colder than -90° C (_____ F) at 101.3 kPa (14.7 psi) absolute.

- Anhydrous ammonia, cryogenic argon, carbon dioxide, compressed nitrogen, neon, and helium.

c 2.3 (_____) means gases that vaporize easily, that are very dangerous to life, even in small amounts. A material that is a gas at 20° C (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 20° C (68° F) or less at 101.3 kPa (14.7 psi), and that:

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, methyl bromide, cyanide gas, hydrocyanic acid, and diphosgene.

- 3 Hazard Zones of poisonous gases
 - a Hazard Zone A - LC50 less than or equal to 200 ppm.
 - b Hazard Zone B - LC50 greater than 200 ppm and less than or equal to 1000 ppm.
 - c Hazard Zone C - LC50 greater than 1000 ppm and less than or equal to 3000 ppm.
 - d Hazard Zone D - LC50 greater than 3000 ppm and less than or equal to 5000 ppm.

2000 Placards

- a Flammable: _____
- b Non-Flammable: _____
- c Oxidizer: _____
- d Poison Gas: _____

(c)00 Class 3

1 Flammable Liquid

- a Major Hazard: _____
- b Definition: _____

- 1 Division 3.1-Flash point _____
- 2 Division 3.2-Flash point _____
- 3 Division 3.3-Flash point _____

c0 Hazard Zones of Flammable Liquids

- 1 Hazard Zone A - LC50 less than or equal to 200 ppm.
- 2 Hazard Zone B - LC50 greater than 200 ppm and less than or equal to 1000 ppm.
 - Acetone, amyl acetate, gasoline, methyl alcohol, and toluene.

200 Combustible Liquid

a Definition:

b Combustible liquids flash point: _____

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

- Mineral oil, peanut oil, No. 6 fuel oil, pine oil, and plastic solvents.

30 Placards

a Flammable:

b Combustible:

(d)00 Class 4 (_____)

1 Major Hazard: _____

2 Divisions

a 4.1 (_____) means any of the following three types of materials:

1 Wetted explosives:

2 Self-reactive materials:

3 Readily combustible solids:

- Magnesium (pellets, turnings, or ribbons), nitrocellulose, safety matches, and sulfur.

b0 4.2 (_____) means any of the following materials:

1 Self-heating material:

- Aluminum alkyls, charcoal briquettes, magnesium alkyls, and phosphorus.

c0 4.3 (_____) 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, and sodium hydride.

30 Placards

a Division 4.1:

b Division 4.2:

c Division 4.3:

(e)00 Class 5 (_____)

1 Major Hazards 5.1: _____

2 Major Hazards 5.2: _____

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

- Ammonium nitrate, bromine trifluoride, calcium hypochlorite, chlorate, and permanganate.

a Division 5.2:

1 Division 5.2 (Organic Peroxide) materials are assigned to one of seven types:

- a Type A - organic peroxide that can detonate or deflagrate rapidly as packaged for transport. Transportation of type A organic peroxides is forbidden.
- b Type B - organic peroxide that neither detonates nor deflagrates rapidly, but that can undergo a thermal explosion.
- c Type C - organic peroxide that neither detonates nor deflagrates rapidly and cannot undergo thermal explosion.
- d Type D - organic peroxide that detonates only partially or deflagrates slowly, with medium to no effect when heated under confinement.
- e Type E - organic peroxide that neither detonates nor deflagrates and shows low, or no, effect when heated under confinement.

f Type F - organic peroxide that will

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

g Type G - organic peroxide that 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, and peroxyacetic acid.

20 Placards

a 5.1:

b 5.2:

(f)0000Class 6 (_____)

1 Major Hazards: _____

2 Major Hazard: _____

3 Divisions

a 6.1 (Poisonous Materials)

- Parathion, Potassium arsenate, tear gas candles, xylyl bromide.

b 6.2 (Infectious Substance)

- Anthrax, botulism, rabies, tetanus, and polio virus.

c If a package addressed to the *Centers for Disease Control* in Atlanta, Georgia is involved in an incident, the contact phone number is (404) 633-5313.

d Packaging Groups

1 PG I or II, other than PG I inhalation hazard)

2 PG III

400 Placard: _____

(g)0 Class 7 (_____)

1 Major Hazard: _____

2 Definition: _____

3 Transport Groups

a Fissile Class I - White I - has a radiation level of < 0.5 millirem per hour (mrem/h)

- Chromium 51

b Fissile Class II - Yellow II - 0.5 mrem/h # Radiation level # 50 mrem/h

- Iodine 131

c Fissile Class III - Yellow III - radiation level is > 50 mrem/h

- Plutonium, Cobalt 60, Uranium, Hexafluoride, Strontium 90.

40 Placard: _____

(h)0 Class 8 (_____)

1 Major Hazards: _____

2 Definition:

- Nitric Acid, Phosphorus Trichloride, Sodium Hydroxide, Sulfuric Acid, and ammonium hydroxide.

3 Placard:

—

(i)0 Class 9 (_____)

1 Definition:

—

a Any material that has an 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.

b Any material that is not included in any other hazard class, but is subject to the DOT requirements (a hazardous substance or a hazardous waste).

- Adipic Acid, hazardous substances such as; PCBs and Molten Sulfur. Hazardous Waste

20 Placard: _____

(j)0 Other Regulated Material (ORM-D)

1 Definition:

—

- Consumer commodities, small arms ammunition, and furniture polish.

2 No placard

(k)0 Forbidden:

(3)0 **System Limitations**

- It is extremely important that the *DOT Emergency Response Guide* be carried on every emergency response vehicle. Nonetheless, there are several limitations to the system.
- (a) Dangerous Placard - This placard can be used for Class C explosives, mixed loads, or irritating materials (ORM A). There is no way for the responder to know, even generally, the primary hazard of the load.
- (b) 1,000-Pound (500 kg) Limitation - There is not much difference in the danger of 1,005 pounds (502 kg) of a hazardous substance and 990 pounds (494 kg).
- (c) Visibility - Placards will be of little use if they are damaged or if the vehicle comes to rest hiding the placard. Obstructions, fog, darkness, and other factors can make the placard useless.
- (d) Unclassified Materials and Exemptions - Many materials like cryogenics are not considered hazardous. Experience has also proven that substances once thought to be perfectly safe are not. In addition, DOT yearly grants hundreds of exemptions from the standard safe transportation rules for a number of reasons, including economics.
- (e) Multiple Hazards - Only the hazard considered the most dangerous is used to classify materials. Chlorine requires two labels, nonflammable gas and poison, when under 110 gallons. (In Canada all quantities are marked as corrosive gas.) It is also highly corrosive and water reactive and can form self-igniting, explosive atmospheres with many substances.

- (f) Degree of Hazard - This system does not indicate the relative level of the hazard like the NFPA 704 system.
 - (g) Human Error and Placarding - The shipper may neglect to change placards for each shipment or may incorrectly placard a load.
 - (h) Enforcement - It is virtually impossible for DOT to enforce all of the regulations all of the time.
- (4)0 Primary hazards associated with each of the DOT hazard classes and divisions. **(2-2.1.3) (HM-181, TABLE 2.1; 1991)**
- (5) Differences between hazardous materials incidents and other emergencies. **(2-2.1.4)**
- (a) They present such a large potential for doing great harm. The affects are far reaching and severe.
 - (b) Responders must be specifically trained and equipped to deal with them properly.
 - (c) Hazardous Materials often have far reaching and long term effects to the environment (cleanup), humans (cancer) and property (contamination).
- (6)0 List some typical occupancies and locations in the community where hazardous materials are manufactured, transported, stored, used, or disposed of. **(2-2.1.5)**
- (a)
 - (b)
 - (c)
 - (d)
 - (e)
 - (f)
 - (g)

- (h)
- (7)0 Personnel developing the pre-incident plans should seek assistance from the _____ in identifying hazardous materials locations and recording them on the plan in a way that will be useful to the first-arriving companies
- (8) Hazardous materials that are manufactured, stored, processed, or used at a particular site are NOT subject to regulations affecting transported materials.
- (9) Hazardous occupancies and problem locations should be identified and evaluated during pre-incident planning
- (10) Typical container shapes that may indicate hazardous materials. **(2-2.1.6)**
 - (a) Individual Containers
 - 1 Boxes
 - a Rigid packaging
 - b Fiberboard, metal, wood, plastic
 - 20 Compressed gas cylinders
 - a Small aerosol containers of metal, glass , or plastic
 - b Uninsulated steel, aluminum or fiberglass
 - 1 No uniform taper on head
 - 2 Varying thread design
 - c0 Insulated (cryogenic) containers
 - 1 Outer jacket insulates inner metal cylinder
 - 2 No valve stem assembly

300 Drums

(b)0 Bulk Containers

1 Tank trucks

2 Tank cars

3 Intermodals

(c)0 Material Unique Containers:

1 Radioactive

a Low level sources may be packaged in:

1 Fiberboard boxes

2 Wooden boxes

3 Steel drums

200 Cryogenics

a Tank-within-a-tank or "Thermos bottle" design

b Absence of top fittings on most containers

30 Corrosives

a Smaller quantities carried in carboys -glass or plastic bottles that may be encased by a protective box

b Large quantities carried in thin tanks with protective metal bands

40 Pressurized Products

- a Carried in heavy cylinders with rounded ends
- b No bottom outlets and little piping
- c Pressure relief devices

50 Flammable Liquids

- a Tanks of varying size and shapes
- b Thin metal shells that lack the pronounced rounded ends associated with cylinders
- c Bottom outlets and piping common

60 Cargo Tank Trailers and Container Vehicles

- a Describe the distinguishing characteristics of the MC -306:

1

2

3

4

5

- b0 Describe the distinguishing characteristics of the MC - 307:

1

2

3

4

5

c0 Describe the distinguishing characteristics of the MC - 312:

1

2

3

4

d0 Describe the distinguishing characteristics of the MC - 312:

1

2

3

e0 Describe the distinguishing characteristics of the MC - 338:

1

2

f0 Describe the distinguishing characteristics of the Tube Trailers:

1

2

g0 Describe the distinguishing characteristics of the Dry bulk carriers:

1

2

3

(11)0000 Facility and transportation markings and colors that indicate hazardous materials. **(2-2.1.7)**

(a) UN/NA Identification numbers

1 United Nations class numbers (bottom of placard)

2 Hazard class or identification number

a Hazard class on placard; ID number on an orange panel

b ID number directly on placard

30 Four digit identification numbers

(b)0 NFPA 704 markings; **(2-2.1.7.1)**

1 NFPA 704-Suggested method for the identification of hazardous materials

a Scale of **0-4**, **4** being the worst possible hazard

b Used for facilities only if mandated by local ordinances

20 Colors and their meaning

a Blue (_____)

1

2

3

4

5

b0 RED: _____

1

2

3

4

5

c0 YELLOW: _____

1

2

3

4

5

d0 WHITE: _____

1

2

3

(c)000 Military hazardous materials marking;

1 Class 1, Division 1: _____

2 Class 1, Division 2: _____

3 Class 1, Division 3: _____

4 Class 1, Division 4: _____

5 Special warnings

a Chemical Hazard

1 Highly Toxic

2 Harassing Agents

3 White Phosphorus Munitions

b0 Apply No Water

c Wear Protective Breathing Apparatus

(d)000 Pipeline marker; - Pipeline markers are usually metal signs placed adjacent to a hazardous materials pipeline right of way. They contain information about:

1 Location

a

b

c

20 Ownership of the line

a Name of carrier

b Phone number of carrier

30 Pipeline markers will include the word " _____ "

4 Transported commodity

(e)0 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."

(12)0 U.S. and Canadian placards and labels that indicate hazardous materials.
(2-2.1.8)

(a) Describe placards

1 Diamond shaped

2 10 3/4 inches square

3 Placed on bulk containers

- 640 cu ft or greater
- _____ gallons or greater (450 liters)
- 881.8 pounds (400 kg)
- _____ water capacity for a gas receptacle (453.6 kg)

a Placard all 4 sides (both sides and ends)

b Background color

- 1 _____ indicates explosive
- 2 _____ indicates flammable
- 3 _____ indicates nonflammable
- 4 _____ indicates oxidizing material
- 5 _____ indicates poisonous material
- 6 White with vertical red stripes indicates:

- 7 _____ indicates
radioactive material
- 8 _____ indicates
corrosive material

c0 Symbols (top of placard)

- 1 _____ indicates explosive
- 2 _____ indicates flammable
- 3 The slash W indicates _____
- 4 The skull and crossbones indicates

- 5 _____ indicates oxidizing
material
- 6 The cylinder _____
- 7 The propeller _____
- 8 The test tube/hand/metal/symbol _____

- 9 The word residue indicates the product has
been removed but a harmful residue may

still be present

- 400 Dangerous Placard
 - a Table 1 Materials
 - b Table 2 Materials
 - c Mixed load, less than 1001 pounds
 - d 5000 pound ruling
 - e Placard description

(b)00 Labels

- 1 Same shape as placards
- 2 4 inches square
- 3 Placed on individual shipping containers if container is smaller than _____.
 - a Placed near manufacturers information
 - b Appearance is similar to placards, see Chart of Labels and Placards for differences

(c)00 Canadian variations

- 1 Corrosive gas placard
- 2 Infectious substance

(13)00 Basic information on material safety data sheets (MSDS) and shipping papers that indicates hazardous materials. **(2-2.1.9)**

(a) Why are they necessary

- 1 State and Federal legislation on Hazard Communications
- 2 Right-to-Know **(29 CFR 1910.1200)**

3 Mandatory Local Notifications on Hazards

(b)0 Information Contained

1 Manufacturers name and location

2 Name and family of chemical

3 Hazardous Ingredients

4 Physical Data

5 Fire and Explosion Data

a Flash point and method

b Autoignition temperature

c Flammability limits in air

d UEL/LEL

60 Health Hazard Data

7 Spill or Leak Procedures

8 Special Protection Information

9 Special Precautions

(c)0 Where to find Material Safety Data Sheets (MSDS). **(2-2.1.9.1)**

1 Can be obtained from the _____ on a particular product

2 Federal OSHA and several states have required local establishments to keep on file an MSDS for each chemical stored or used on site.

- Central Location at Facility

3 Local government emergency response personnel can avoid considerable confusion if the MSDS is utilized in pre-incident planning.

- 4 Bio-environmental will have a copy of all hazardous materials on base.
- (d)0 Entries on a material safety data sheet that indicates the presence of hazardous materials. **(2-2.1.9.2)**
- 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.
- (e)0 Entries on shipping papers that indicate the presence of hazardous materials. **(2-2.1.9.3)**
- 1 Name of shipper
 - 2 Name of consignee

- 3 Basic description stress term ("basic description" as a title to a thru d and is a term unique to shipping papers.)
- a Proper shipping name
 - b Hazard class or division
 - c Product Identification Number - 4 digit ID Number - 4 digit ID preceded by UN or NA
 - d Quantity by weight or by volume
- 40 Haz/Mats must be listed
- a First
 - b Contrasting color
 - c Checked in a haz/mat column
- 50 RQ- Reportable Quantity - EPA hazardous substance (Emergency Response Guidebook, 1993, inside front cover)
- a EPA Extremely hazardous substance (EHS)
 - b Pounds over kilograms (e.g. 10/4.54)
- 60 STCC- Standard Transportation Commodity Code applies to materials shipped by_____.
- a Seven digits
 - b First two digits

1 49 - _____

2 48 - _____

c0 Middle three digits are for class/Grouping of material

d Last three digits are for product specific

70 Chemical Abstract Service (CAS) number

(f)0 Title of shipping paper **(2-2.1.9.4)**

1 _____ "Bill of Lading/Freight Bill"

2 Rail- " _____ "

3 _____ "Dangerous Cargo Manifest"

4 _____ - "Air Bill with shippers certification for restricted articles"

(g)0 Location of shipping paper, Responsible person **(2-2.1.9.5)**
(2-2.1.9.6) (2-2.1.9.7)

1 Highway: _____

2 Rail: _____

3 Water _____

● Bridge is a common term for the area above the main deck of a ship from which the ship is controlled

4 Air- _____

5 Emergency

(h)0 Examples of clues that use the senses of sight, sound and odor:
(2-2.1.10)

1 Odors

- a Gas leaks
 - b Fire or Vapor Cloud
 - c Peculiar smells
- 20 Sight
 - a Distinctive colored vapor cloud (ie; Chlorine or Ammonia)
 - b Visible corrosive actions, chemical reactions, pooling liquids, pressure releases, condensation lines on pressure tanks, injured victims, or casualties.
 - c Extraordinary fire conditions
 - d Peeling or discoloration of a container's finish
 - e Spattering or boiling of unheated liquids
 - f Smoking or self-igniting materials
 - g Unexpected deterioration of equipment
 - h Unexplained changes in ordinary materials
- 30 Sound
 - a Hissing of pressure releases
 - b Warning buzzers, bells, and other alarms
- 40 Informal methods of identification
 - a Verbal reports by bystanders or responsible persons
 - b Occupancy type
 - c Incident location

- d Visual physical/chemical indicators
- e Trade and common names
- f Container characteristics like markings, color, or shape
- g Non-regulated industry standards
- h Experience and judgment
- i Use of the senses

50 Decisions that can risk human life should never rely solely on informal methods of identification. Informal clues to identification can be useful before formal identification is completed when it is unreliable, or unattainable.

(i)0 Limitations of using the senses in determining the presence or absence of hazardous materials **(2-2.1.11)**

1 Odor:

2 Sight:_____

3 Sound:_____

4 Risk of Injury

- a Too close to smell
- b Too close to see
- c Touching
- d Taste

50 All emergency personnel should be especially watchful for
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the onset of any symptoms of chemical exposure which can occur separately or in clusters depending on the chemical.

a Some symptoms include the following:

- 1 Changes in respiration: difficulty breathing, tightness of the chest, irritation of the nose and throat, suffocation, respiratory arrest.
- 2 Changes in consciousness: dizziness, drowsiness, confusion, fainting, unconsciousness, coma.
- 3 Abdominal distress: nausea, vomiting, cramping
- 4 Change in activity level: fatigue, weakness, stupor, hyperactivity, restlessness, anxiety, giddiness, faulty judgment.
- 5 Visual disturbances: double vision, blurred vision, cloudy vision, burning of the eyes, dilated pupils.
- 6 Skin changes: burning sensations, reddening, paleness, fever, chills
- 7 Changes in excretion or thirst: uncontrolled tears, profuse sweating, mucus flowing from the nose, diarrhea, frequent urination, bloody stool, intense thirst
- 8 Pain: headache, muscle ache, stomachache, chest pain, localized pain at sites of substance contact.

b0 At the onset of physical symptoms, those affected should withdraw immediately to a safe location for decontamination.

b.0000 Given a shipping paper, Material Safety Data Sheets(MSDS), and various U.S. and Canadian placards and/or labels, identify the presence of a hazardous material within 20 minutes and with 19 out of 19 evaluation elements identified correctly.

(2-2.2)

(1) Difficulties in determining the specific names of hazardous materials in both facilities and transportation **(2-2.2.1)**.

(a) Facilities

- 1 Materials not included on inventories
- 2 MSDS's wrong or not on file
- 3 NFPA 704 symbols are not mandatory
- 4 Facility managers not available

(b)0 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

(2)00 Sources for obtaining the names of UN\NA identification numbers for, or types placard associated with hazardous materials in transportation **(2-2.2.2)**

(a) DOT Emergency Response Guidebook

(b) Shipping papers

(c) 49 CFR 172

(d) Canadian Dangerous Goods Guide to Initial Emergency Response

(3)0 Sources for obtaining names of hazardous materials in a facility

(a) Material Safety Data Sheets

(b) Markings on Container

(c) Emergency Planning Documents

c.00 Given a current DOT Emergency Response Guidebook (ERG), a specific name, UN/NA number, and/or placard/label type for a specific hazardous material, locate emergency information within the guidebook within 20 minutes with at least 17 out of 17 evaluation elements identified correctly. **(2-2.3)**

- (1) The ERG is an initial, ready, quick reference information resource.
- (2) Ways hazardous materials are harmful to people, the environment, and property at hazardous materials incidents.**(2-2.3.1)**

- (a) _____
- (b) _____
- (c) _____
- (d) _____
- (e) _____
- (f) _____
- (g) _____
- (h) _____

(3)0 Three factors which affect or determine the level of harm:

- (a) Timing of release

1 _____

2 _____

(b)0 Size of the dispersing pattern and the area covered

(c) Lethality of the chemicals involved

1 _____

2 _____

(4)00 General routes of entry for human exposure to hazardous materials.
(2-2.3.2)

(a) _____ - skin surface Hazard/Damage (Burns)

(b) Absorption - _____

(c) _____ - respiratory function

(d) Ingestion - _____

(5)0 Determining the appropriate guide page for a specific hazardous material.
(2-2.3.3)

(a) Four-digit ID number on:(Yellow Pages)

1 A placard

2 An orange panel

3 Shipping papers

4 Packaging

(b)0 Spelling of the product on:(Blue Pages)

1 Shipping papers

2 Packaging

3 Placard

(c)0 Placards (Table of Placards)

(d) Dealing with an unknown/ Dangerous placard

1 Guide# _____

STUDENT WORKBOOK
IMPLEMENTING THE PLANNED RESPONSE

PRESENTATION:

200000003. Competencies - Implementing the Planned Response

- (1) Location of both the local emergency response plan and the organization's standard operating procedures. **(2-4.1.1)**
 - (a) Emphasis should be made that each agency maintains it's own SOP not each other's
 - (b) Base Fire Dept
 - (c) Base Disaster Preparedness
 - (d) Local Mutual Aid Fire Dept
- (2)0 DOT Emergency Response Guidebook, differences between the protective action distances in the orange-bordered guide pages and the green-bordered pages in the document. **(2-4.1.2)**
 - (a) Orange-bordered pages (Emergency Action Section)
 - 1 Provides for selected materials that are _____

- 2 These distances may extend up to 1 mile in all directions.
 - (b)0 Green-bordered pages (Table of Initial Isolation and Protective Action Distances)
 - 1 Used for materials _____
 - 2 Recommended downwind protective action distances
- (3)00 The role of the first responder at the awareness level during a hazardous materials incident. **(2-4.1.3)**
 - (a) The guidelines for this are found in;
 - 1 The local emergency response plan (ERP)
 - 2 The organization's standard operating procedures (SOP's).
 - (b)0 The plan should establish the methods and procedures that facility owners and operators, as well as local emergency and medical response personnel, are to follow.
 - (c) Responders at all levels must understand the importance of their individual responsibilities.
 - (d) The first responder on the scene must accurately assess the situation and initiate the appropriate response measures.
- (4)0 Basic precautions to be taken by the awareness level responder to protect themselves and others in a hazardous materials incident. IAW the Emergency Response Plan (ERP) or SOP's **(2-4.1.4)**
 - (a) Take protective action to isolate the hazard area
 - 1 Evacuate those in danger from the immediate area.
 - 2 Deny entry to unauthorized personnel
 - ! Responders such as yourself and other awareness, ops, etc. will remain in a safe location to direct

and/or perform your tasks.

(b)0 If evacuation is not possible

1 Responders are to provide_____.

2 Utilize additional resources

(5)00 Precautions necessary when providing emergency medical care to victims of hazardous material incidents. **(2-4.1.4.1)**

(a) The victim may be contaminated, decontamination measures must be considered.

(b) Awareness level responders may not be wearing respiratory protection or any other personal protective clothing.

(c) Understanding your limitations will prevent you from becoming a victim.

(6)0 Typical ignition sources found at the scenes of hazardous materials incidents. **(2-4.1.4.2)**

(a) Ignition Sources

1 Heated surfaces

2 Frictional heat

3 Radiant heat

4 Spontaneous ignition

- 5 Lightning
- 6 Open flames
- 7 Smoking materials
- 8 Cutting and welding operations
- 9 Static electricity
- 10 Electrical and Mechanical Sparks
- 11 Chemical Reactions

(b)0 Measures for Controlling Vapors

(7)0 Emergency Response Guidebook **(2-4.1.5)**

(a) Response information

- 1 Emergency action (fire, spill, leak & first aid)
- 2 Personal protective equipment necessary
- 3 Initial isolation & protective action distances

(b)0 Recommended personal protective equipment **(2-4.1.5.1)**

- 1 _____
- 2 Structural fire fighter's protective clothing
- 3 _____
- 4 Chemical-protective clothing and equipment.

(c)0 Protective action and definitions **(2-4.1.5.2)**

- 1 Isolate hazard area and deny entry

a Everybody not directly involved in the emergency response operations should be kept away from the affected area.

b Unprotected emergency responders should not be allowed entry.

20 Evacuate

a Define:

b To perform an evacuation, there must be enough time to warn the people, to get them ready to go, and leave the area.

30 In-place protection

a Define:

b When evacuating the public would put them at greater risk than directing them to stay in place.

(d)00 Recommended shapes of initial isolation and protective action zones. **(2-4.1.5.3) (ERG, 1993, Table 2.3)**

1 Initial isolation zone is a circle minimum of _____ radius.

2 The protective action zone is a _____ shape with a minimum of _____ (approx. 1000') down wind.

(e)0 Difference between small and large spills as found in the table of isolation distances. **(2-4.1.5.4)**

1 Small spill
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a _____

b _____

20 Large spill

a Leak or spill from a large package

b _____.

c A large spill would be a - ton cylinder, a tank truck, or a rail car.

(f)00 Circumstances under which the following distances are used at a hazardous materials incident **(2-4.1.5.5)**

1 Table of initial isolation and protective action distances - use when the material is _____.

2 Isolation distance in the numbered guides - used when the material is _____.

(8)00 Techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials incidents. **(2-4.1.6)**

(a) Use a vehicle to block a road.

(b) Place a rope or some other type of barricade across the entrance to the area.

(c) _____..

(d) It may be as simple as closing a door in a facility.

(e) _____.

(9)0 Initial notification procedures for hazardous materials incidents in the local emergency response plan or the organization's standard operating procedures. **(2-4.2.1)**

- (a) Awareness level responders **MUST** be familiar with their _____, which will vary at each location.
 - (b) May involve notifying local fire or police.
 - (c) Internal organization notifications such as on sight specialist, fire brigade, or security.
- (10)0 Whatever the procedures, the Awareness level responder must rapidly set the proper notification process in motion.