PRACTICE USING THE 2016 ERG (Emergency Response Guidebook) AND OTHER RESOURCES

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To use this training aid as a PowerPoint-style presentation see the instructions in Slide #5
Some images obtained from Miscellaneous WWW Sites and unknown published sources.

**WARNING:** Read Slide #3 and Slide #4 completely before using!

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LAKELAND COMMUNITY COLLEGE
Home of a Classroom Based and an OnLine Fire Science Degree Program
and an OnLine Emergency Management (aka Disaster Planning / Homeland Security) Degree

Both are Internationally Accredited by IFSAC

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http://www.lakelandcc.edu/firesafety
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INSTRUCTIONS:

• To used this training aid in a “PowerPoint-style” slide mode click on “View” then “Full Screen Mode”. You can then use your up/down or arrow keys to advance the slides. This is also compatible with most remote control devices.

• This presentation mostly consists of alternating pairs of slides.

• In most cases the first slide will present you with questions. The second slide in each pair provides you with suggested answers.

• For each slide you should also consider / review the information found on the orange pages such as the general hazard found at the top of the page, and other information found in the pairs of orange pages. In some cases you will first go to the green pages. WHY?

• DISCLAIMER: These are practice samples only and perfect accuracy is NOT GUARANTEED. Report any errors to lsilvi@lakelandcc.edu
Please note – Other Identification Systems exist. These slides primarily review:

- UN / DOT Placards and Labels.
- NFPA 704® System
- HMIS-1®, HMIS-2®, and HMIS-3®
- The newer “Globally Harmonized System”
- The European / South American System
- Pipeline identification in the United States
- The HFR System®
- Selected proprietary labeling systems
• Given the placard or symbol at the left what is the name of the material?
  ?

• What type of material is it?
  ?

• What is the correct guide number?
  ?
• Given the placard or symbol at the left what is the name of the material?

Propane (et. Al.)

• What type of material is it?

Flammable gas

• What is the correct guide number?

115
• Given the placard or symbol at the left what is the name of the material?
  ?

• What type of material is it?
  ?

• What is the correct guide number?
  ?
Given the placard or symbol at the left what is the name of the material?

Methanol (and ?)

What type of material is it?

Flammable liquid

What is the correct guide number?

131
• Given the placard or symbol at the left what is the name of the material?
  ?
• What type of material is it?
  ?
• What is the correct guide number?
  ?
Given the placard or symbol at the left what is the name of the material?

**Hydrochloric Acid**

What type of material is it?

**Corrosive / Toxic?**

What is the correct guide number?

157
• Given the placard or symbol at the left what is the name of the material?
  
• What type of material is it?
  
• What is the correct guide number?
• Given the placard or symbol at the left what is the name of the material?  
  **Unknown**  
• What type of material is it?  
  **Infectious Substances**  
• What is the correct guide number?  
  **158**
• Given the placards or symbols at the left what is the name of the material?

?  

• What type of material is it?

?  

• What is the correct guide number?

?
• Given the placards or symbols at the left what is the name of the material?

Unknown

• What type of material is it?

Gases, Toxic and/or Corrosive

• What is the correct guide number?

123 (See pages 8 & 9)
• Given the placard or symbol at the left what is the name of the material?

• What type of material is it?

• What is the correct guide number?
• Given the placard or symbol at the left what is the name of the material?

Unknown

• What type of material is it?

Substances, Toxic and/or Corrosive

• What is the correct guide number?

153 (See pages 8 & 9)
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?

See Pages 20-25
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?

-or-

?
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?

See “Note” on Page 21

(Also: See page 123 in the 2016 Guidebook)
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?

?
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?

Pages 20-25
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?
Given the placard or symbol at the left, to what page in your ERG might you turn for initial guidance?

Pages 20-25
• Given the placard or symbol at the left what is the name of the material? ?

• What type of material is it? ?

• What is the correct guide number? ?
• Given the placard or symbol at the left what is the name of the material?
  Unknown

• What type of material is it?
  Water Reactive + Flammable/Toxic Gases

• What is the correct guide number?
  139  (see the 2016 ERG, page 9)
• Given the placard or symbol at the left what is the name of the material?

• What is the UN Number?

• What is the correct guide number?
• Given the placard or symbol at the left what is the name of the material?  
  **Unknown**

• What is the UN Number?  
  **Unknown**

• What is the correct guide number?  
  **111** (See the 2016 ERG, page 8)
• Given the placard or symbol at the left what is the name of the material?

• What is the UN Number?

• What is the correct guide number?
• Given the placard or symbol at the left what is the name of the material? **Unknown**

• What is the UN Number? **Unknown**

• What is the correct guide number? **111** (See the 2016 ERG, pages 8 and 9)
3,5-DICHLORO-2,4,6-TRIFLUOROPYRIDINE
(Shipping Paper)

• UN Number ?

• Guide Number ?

• Hazard?
3,5-DICHLORO-2,4,6-TRIFLUOROPYRIDINE
(Shipping Paper)

• UN Number = 9264

• Guide Number = Use Guide 151 or the Green Pages whichever is applicable. (See ERG page 20 or 90 for details on when each applies)

• Hazard = Toxic Substance
• Given the highway trailer at the left what is the name of the material?

?  

• What is the UN Number?

?  

• What is the correct guide number?

?
• Given the highway trailer at the left what is the name of the material?  
Unknown
• What is the UN Number?  
Unknown
• What is the correct guide number?
131  (See the 2016 ERG, pages 12 & 13)
• Given the placard or symbol at the left what is the name of the material?

?  

• What type of material is it?

?  

• What is the correct guide number?

?
• Given the placard or symbol at the left what is the name of the material?

Pesticide, n.o.s.
("n.o.s." Stands for not otherwise specified.)

• What type of material is it?

Toxic

• What is the correct guide number?

151
• Given the placard or symbol at the left what is the name of the material? 

• What type of material is it? 

• What is the correct guide number?
• Given the placard or symbol at the left what is the name of the material? **Unknown**
• What type of material is it? **Flammable Gas**
• What is the correct guide number? **118** *(See pages 8 & 9)*
• Given the placard or symbol at the left what is the name of the material?

?

• What type of material is it?

?

• What is the correct guide number?

?
Given the placard or symbol at the left what is the name of the material?

**Hydrogen Chloride**

What type of material is it?

**Toxic and/or Corrosive**

What is the correct guide number?  

As applicable:  
Use Guide **125** or the Green Pages!

Note:  This is an Orange Panel that might be found next to a US Placard.  It is not quite the same as the European or South American ADR System.
• Given the code at left, what is this material? ?

• What is it’s major hazard? ?

• What is the correct guide number? ?

• What ID system is this? ?
Given the code at left, what is this material?
Sulfur Chlorides

What is its major hazard?
It is a Corrosive / Water Reactive Substance

What is the correct guide number?
As applicable: Use either Guide 137 or the Green Pages!

What ID system is this?
European / S. American But it has been found on IM shipments in the US (See 2016 E.R.G., page 16)
• Given the placard or symbol at the left what is the name of the material?
  
  ?

• What is the UN Number?
  
  ?

• What is the correct guide number?
  
  ?
• Given the placard or symbol at the left what is the name of the material?

**Unknown**

• What is the UN Number?

**Unknown**

• What is the correct guide number?

134
DRIVE SAFELY PLACARD

(But you have unusual smoke / fire conditions)

- UN Number?
- Guide Number?
DRIVE SAFELY PLACARD
(But you have unusual smoke / fire conditions)

- UN Number = Unknown
- Guide Number = 111
• Given the placard or symbol at the left what is the hazardous material? ?

• What is the UN Number? ?

• What is the correct guide number? ?
• Given the placard or symbol at the left what is the hazardous material?
  Organic Peroxide (a “newer” style placard)

• What is the UN Number?
  ?

• What is the correct guide number?
  148
• Given the placard or symbol at the left what is the hazard?

• What is the UN Number?

• What is the correct guide number?
• Given the placard or symbol at the left what is the hazard?

This is an “Environmentally Hazardous Substance Mark”

• What is the UN Number?

?  

• What is the correct guide number?

171
Given the code at left, what is this material?

What are it’s major hazards?

What is the correct guide number?

What ID system is this?
• Given the code at left, what is this material? Acetyl Chloride
• What are its major hazards? Water reactive, highly flammable, & corrosive!
• What is the correct guide number? As applicable: Use Guide 155 or the Green Pages!
• What ID system is this? European / S. American
• Given the placard or symbol at the left what is the name of the material? ?
• What is the UN Number? ?
• What is the correct guide number? ?
• Given the placard or symbol at the left what is the name of the material? **Unknown**

• What is the UN Number? **Unknown**

• What is the correct guide number? **171**
TOLUENE (Shipping Paper)

- UN Number?
- Guide Number?
- Hazard?
TOLUENE (Shipping Paper)

- UN Number = 1294
- Guide Number = 130
- Hazard = Noxious Flammable Liquid
• Given the highway trailer at the left what is the name of the material?

• What type of material?

• What is the correct guide number?
- Given the highway trailer at the left what is the name of the material?
  Unknown
- What type of material?
  A Corrosive
- What is the correct guide number?
  137 (see page 13 of the 2016 ERG)
• Given the placard or symbol at the left what is the name of the material?

• What type of material is this?

• What is the correct guide number?
• Given the placard or symbol at the left what is the name of the material?

Hydrogen Cyanide

• What type of material is this?

Toxic / Corrosive

• What is the correct guide number?

As applicable: Use Guide 152 or the Green Pages!
• Given the code at left, what is this material? 

?

• What is its major hazard? 

?

• What is the correct guide number? 

?

• What ID system is this? 

?
• Given the code at left, what is this material? Gasoline, (a.k.a. Petrol, Gasohol, Motor Spirits)
• What is its major hazard? Highly flammable
• What is the correct guide number? 128
• What ID system is this? European / S. American
HYDROGEN (Shipping Paper)

- UN Number?
- Guide Number?
- Hazard?
HYDROGEN (Shipping Paper)

• UN Number = 1049

• Guide Number = 115

• Hazard = Flammable Gas
NO PLACARD

(But you have unusual smoke / fire conditions)

• UN Number?

• Guide Number?
NO PLACARD

(But you have unusual smoke / fire conditions)

- UN Number = Unknown
- Guide Number 111
2-METHYLFURAN
(Shipping Paper)

- UN Number?
- Guide Number?
- Hazard?
2-METHYLFLURAN
(Shipping Paper)

- UN Number = 2301
- Guide Number = 128
- Hazard = Flammable Liquid
• Given the placard or symbol at the left what is the name of the material?
  ?
• What type of material is it?
  ?
• What is the correct guide number?
  ?
• Given the placard or symbol at the left what is the name of the material?

  Chlorine

• What type of material is it?

  “Gas, Toxic and/or Corrosive - Oxidizing”

• What is the correct guide number?

  As applicable: Use Guide 124 or the Green Pages!
LITHIUM ION BATTERIES
(including lithium ion polymer batteries)
Shipping Papers

• UN Number ?

• Guide Number ?
LITHIUM ION BATTERIES
(including lithium ion polymer batteries)
Shipping Papers

• UN Number: 3480
• Guide Number: 147

Note: This is a newer guide found in the Emergency Response Guidebook. You will not find this in editions prior to the 2008 ERG.

This is one reason why you should ALWAYS use the most current edition of the ERG.
n-PENTANE
(Shipping Paper)

- UN Number ?
- Guide Number ?
- Hazard ?
n-PENTANE
(Shipping Paper)

• UN Number = 1265

• Guide Number = 128

• Hazard = Flammable Liquid
• Given the rail car at the left what is the name of the material?
?
• What is the UN Number?
?
• What is the correct guide number?
?
Given the rail car at the left what is the name of the material?  
Unknown

What is the UN Number?  
Unknown

What is the correct guide number?  
111 (see page 11 in the 2016 ERG)
• Given the code at left, what is this material?

• What is it’s major hazard?

• What is the correct guide number?

• What ID system is this?
Given the code at left, what is this material?  
**Acetal**

What is its major hazard?  
**Highly Flammable**

What is the correct guide number?  
**127**

What ID system is this?  
**European / S. American**
• Given the placard or symbol at the left what is the name of the material?

• What type of material is it?

• What is the correct guide number?
• Given the placard or symbol at the left what is the name of the material?

**Arsine or “SA”**

• What type of material is it?

**Toxic and Flammable!**

• What is the correct guide number?

As applicable: Use Guide **119** or the **Green Pages**!
• Given the symbol at the left what is the name of the material?  
  ?  
• What type of material is it?  
  ?  
• What is the correct guide number?  
  ?
• Given the symbol at the left what is the name of the material?
  Radioactive III, n.o.s.

• What type of material is it?
  Radioactive III, thus a **HIGH** Level Radioactive Material

• What is the correct guide number?
  **163**
• Given the placard or symbol at the left what is the name of the material?

?  

• What type of material is it?

?  

• What is the correct guide number?

?  

EXPLOSIVES
1.1*  

1
• Given the placard or symbol at the left what is the name of the material? **Explosives, n.o.s.!**

• What type of material is it? **Fragmentation Hazard Explosives**

• What is the correct guide number? **112**

(See pages 6, 8, 15, 27, 118, 162 and 163 in the 2016 Emergency Response Guidebook)
• Given the placard or symbol at the left what is the name of the material?

?

• What type of material is it?

?

• What is the correct guide number?

?
• Given the placard or symbol at the left what is the name of the material?

Organophosphorus Pesticide, solid ...

• What type of material is it?

Toxic & Combustible

• What is the correct guide number?

152
DRIVE SAFELY PLACARD

(But you have unusual smoke / fire conditions)

- UN Number?
- Guide Number?
DRIVE SAFELY PLACARD

(But you have unusual smoke / fire conditions)

- UN Number = Unknown
- Guide Number = 111
• Given the placard or symbol at the left what is the name of the material?
  
  ?

• What is the UN Number?
  
  ?

• What is the correct guide number?
  
  ?
• Given the placard or symbol at the left what is the name of the material?  
**Organic Peroxide, n.o.s.**

• What is the UN Number?  
**Unknown**

• What is the correct guide number?  
**148**
You have encountered an IM tank on a truck trailer. Both of these placards are displayed. What might this material be?

What is the UN Number?

What is the Guide Number?

What are the potential hazards of these materials?
• You have encountered an IM tank on a truck trailer. Both of these placards are displayed. What might this material be?
  Carbon Bisulfide or?
• What is the UN Number?
  1131
• What is the Guide Number?
  131
• What are the potential hazards of these materials
  It is a toxic flammable liquid. Remember, MANY HazMats have more than one hazard, but this is one that should display both a primary risk and a subsidiary risk placard.
• Given the rail car above, what is the name of the material?
  
• What is the UN Number?
  
• What is the correct guide number?
• Given the rail car above, what is the name of the material? This car is nicknamed the “Candystriper”. Its cargo is normally Hydrocyanic Acid - UN 1051

• What is the correct guide number?

  As applicable: Use Guide 117 or the Green Pages!
  *(See page 26 or 92 for details on when each applies)*
NO VISIBLE PLACARD?
(But you have unusual smoke / fire conditions)

- UN Number?
- Guide Number?
- Hazard?
NO VISIBLE PLACARD?
(But you have unusual smoke / fire conditions)

• UN Number = Not applicable

• Guide Number = 111

• Hazard = Unknown !!!
LITHIUM NITRIDE (Spilled in Water)

- UN Number = ?

- Guide Number = ?
LITHIUM NITRIDE (Spilled in Water)

Determining this one, and many others that are considered “hazardous when spilled in water”, is much more complicated!
Determining this one is More Complicated (continued):

(1) Lithium Nitride is UN 2806

The Guide Number is 138

(see page 128 in the 2016 ERG)

BUT ..... (see the next 5 slides)
LITHIUM NITRIDE (Spilled in Water)

Determining this one is More Complicated (continued):

(1) Lithium Nitride is UN 2806 / Guide 138 (see page 128)
(2) It is a highlighted material, in Water, so go to the green pages (page 317, which refers you to page 351).
LITHIUM NITRIDE (Spilled in Water)

Determining this one is More Complicated (continued):

(1) Lithium Nitride is UN 2806 / Guide 138 (see page 128)
(2) It is a highlighted material, in Water, so go to the green pages (page 317, which refers you to page 351)
(3) On page 351 you see the TIH is NH₃ - Ammonia
LITHIUM NITRIDE (Spilled in Water)

Determining this one is More Complicated (continued):

1. Lithium Nitride is UN 2806 / Guide 138 (see page 128)
2. It is a highlighted material, in Water, so go to the green pages (page 317, which refers you to page 351)
3. On page 351 you see the TIH is NH$_3$ - Ammonia
4. Look up Ammonia in the Blue pages = UN 1005
LITHIUM NITRIDE (Spilled in Water)

**Determining this one is More Complicated (continued):**

1. Lithium Nitride is UN 2806 / Guide 138 (see page 128)
2. It is a highlighted material, in Water, so go to the green pages (page 317, which refers you to page 351)
3. On page 351 you see the TIH is NH$_3$ - Ammonia
4. Look up Ammonia in the Blue pages = UN 1005
5. Then look up UN 1005 in the green pages
LITHIUM NITRIDE (Spilled in Water)

**Determining this one is More Complicated (continued):**

1. Lithium Nitride is UN 2806 / Guide 138 (see page 128)
2. It is a highlighted material, in Water, so go to the green pages (page 317, which refers you to page 351)
3. On page 351 you see the TIH is NH₃ - Ammonia
4. Look up Ammonia in the Blue pages = UN 1005
5. Then look up UN 1005 in the green pages
6. Use the protection distances that provide the most safety for you - the one for UN 2806 or UN 1005 and **MOVE** there or farther away **NOW**!
• What type of material is this?

• What is the correct guide number?

• What is this material?
• What type of material is this? 

**Toxic +**

• What is the correct guide number? 

153

• What is this material?

It could be one of numerous HazMats that share the same UN number. Most are chemical warfare agents. One of these is Sarin. According to NIOSH: “Sarin (military designation GB), is a nerve agent that is one of the most toxic of the known chemical warfare agents. It is generally odorless and tasteless. Exposure to sarin can cause death in minutes. A fraction of an ounce (1 to 10 mL) of sarin on the skin can be fatal. Nerve agents are chemically similar to organophosphate pesticides and exert their effects by interfering with the normal function of the nervous system”.
• Given the placard or symbol at the left what is the name of the material?

?  

• What type of material is this?

?  

• What is the correct guide number?

?
• Given the placard or symbol at the left what is the name of the material?

**It could be one of many that share the same UN Number. If safe to obtain, you will need the shipping papers or MSDS.**

• What type of material is this?

**Corrosive**

• What is the correct guide number?

**154**

**Note:** There are many other HazMats that share UN Numbers.
• Given the placard or symbol at the left what is the name of the material?

?

• What type of material is this?

?

• What is the correct guide number?

?
Given the placard or symbol at the left what is the name of the material?

It could be one of many that share the same UN Number. If safe to obtain, you will need the shipping papers or MSDS.

What type of material is this?

Flammable Liquid

What is the correct guide number?

128

Once again, this is one of many other HazMats that share UN Numbers.
• Given the information below what is the name of the material?

• What is the UN Number?

• What is the correct guide number?
• Given the information below what is the name of the material?
  **Multiple Materials are on board**

• What is the UN Number?
  **UN 1789, 1824, and 2372**

• What is the correct guide number?
  **If you’re not sure which is leaking use the “most restrictive” guide of the three!**
ANOTHER EUROPEAN SYSTEM:

This system has an "Emergency Action Code" within one of the panels

BUT ....
ANOTHER EUROPEAN SYSTEM:

The "Emergency Action Code" is **NOT** the same as the two digit European or S. American Hazard ID Numbers!
Regarding a BLEVE, what is the minimum time to failure for a severe torch of a 2000 liter container?
Regarding a BLEVE, what is the minimum time to failure for a severe torch of a 2000 liter container?

For the answer to this you could have referred to pages 368 and 369 of the 2016 Emergency Response Guidebook.
What is the minimum outdoor evacuation distance for a high explosive IED pipe bomb?
What is the minimum outdoor evacuation distance for a high explosive IED pipe bomb?

For the answer to this you could have referred to page 374 of the 2016 Emergency Response Guidebook.
What is the night time down wind protection distance for an agricultural nurse tank of UN1005 if the winds are greater than 12 MPH?
What is the night time down wind protection distance for an agricultural nurse tank of UN1005 if the winds are greater than 12 MPH?

For the answer to this you could have referred to page 355 of the 2016 Emergency Response Guidebook.
What is the night time down wind protection distance for a single ton container of UN1052 if the winds are greater than 12 MPH?
What is the night time down wind protection distance for a single ton container of UN1052 if the winds are greater than 12 MPH?

For the answer to this you could have referred to page 357 of the 2016 Emergency Response Guidebook.
Have you checked your Emergency Response Guidebook for any needed corrections?

Do you know how to check for corrections?
Have you checked your Emergency Response Guidebook for any needed corrections?

**Did you know an errata has been issued for the 2016 ERG?**

You should periodically visit this web site to check for errata information applicable to your ERG:

https://www.phmsa.dot.gov/hazmat/corrections-to-the-erg

If the above page returns an error message, type the word “errata” in the search box found on this web page.

https://www.phmsa.dot.gov/
• Given the placard or symbol at the left what is the name of the material?

?  

• What is the UN Number?

?  

• What is the correct guide number?

?
• Given the placard or symbol at the left what is the name of the material?
• What is the UN Number?
• What is the correct guide number?

All Are Unknown: By itself, the NFPA 704 System does not provide answers to the above questions!
The NFPA 704 System

Note: Prior to the 2007 edition of NFPA 704 the standard used the word “Reactivity”. As of 2007 this has been replaced with “Instability”. You will likely see both uses for many, many years.

Note: The above guide is NOT the “official” NFPA guide. Also, NFPA 704 (2007) only recognizes the “slash W”, OX, and SA. Although often used, all other “special hazard” symbols are NOT NFPA 704 compliant.
The NFPA 704 System

For the following slides you are to determine the risk. In the second of each slide pair I have added any Special Hazard information. In real life Special Hazard Information may not always be present, even when applicable!

Note: Most hazard ratings in the NFPA 704 system, and most other systems, assume the material is in it’s normal state, at room temperature, and not in contact with other materials that can alter the hazard characteristics of the rated material.
• Health Hazard = ?

• Flammability = ?

• Instability = ?

• Special Info?

Note: Prior to the 2007 edition of NFPA 704 the standard used the word “Reactivity”. As of 2007 this has been replaced with “Instability”. You will likely see both uses for many, many years.
• Health Hazard = 0

• Flammability = 4

• Instability = 0

• Special Info = None Noted under normal conditions. (Room temperature and not mixed with any other materials)
• Health Hazard = ?

• Flammability = ?

• Instability = ?

• Special Info?
• Health Hazard = 3

• Flammability = 4

• Instability = 3

• Special Info = Oxidizer
• Health Hazard = ?

• Flammability = ?

• Instability = ?

• Special Info?
• Health Hazard = 2
• Flammability = 4
• Instability = 3
• Special Info = Use No Water
• Health Hazard = ?
• Flammability = ?
• Instability = ?
• Special Info?
• Health Hazard = 2
• Flammability = 4
• Instability = 3
• Special Info = Use No Water
• Health Hazard = ?

• Flammability = ?

• Instability = ?

• Special Info?
• Health Hazard = 3
• Flammability = 2
• Instability = 1
• Special Info = Use No Water
- Health Hazard = ?
- Flammability = ?
- Instability = ?
- Special Info?
• Health Hazard = 2

• Flammability = 3

• Instability = 4

• Special Info = Radioactive
• Health Hazard = ?

• Flammability = ?

• Instability = ?

• Special Info?
• Health Hazard = 3
• Flammability = 4
• Instability = 3
• Special Info = Use No Water
- Health Hazard = ?
- Flammability = ?
- Instability = ?
- Special Info?
• Health Hazard = 3

• Flammability = 1

• Instability = 0

• Special Info = None Noted under normal conditions
• Health Hazard = ?

• Flammability = ?

• Instability = ?

• Special Info?
• Health Hazard = 4

• Flammability = 4

• Instability = 4

• Special Info = Use No Water
• Health Hazard = ?
• Flammability = ?
• Instability = ?
• Special Info?
• Health Hazard = 3

• Flammability = 4

• Instability = 3

• Special Info = Use No Water
• Health Hazard = ?

• Flammability = ?

• Instability = ?

• Special Info = ?
Obviously this facility has multiple hazards. Therefore, detailed pre-emergency planning and obtaining SDS for all products is critical!
Given the placard or symbol at the left what is the name of the material?

What is the UN Number?

What is the correct guide number?

Note: As of December 2008 the HMIS still used the word “Reactivity”. Whereas, as of 2007, NFPA 704 uses the word “Instability”. You will likely see both uses for many, many years.
• Given the placard or symbol at the left what is the name of the material?

• What is the UN Number?

• What is the correct guide number?

All Are Unknown:
By itself, the HMIS System does not provide the answers to the above questions?
• By itself, the HMIS does not provide the name of the material, UN number, or ERG Guide Number.

• The rating numbers are similar to the NFPA 704 System, but may not use the same testing methods.

• The HMIS label may include a PPE Code
By itself, the HMIS does not provide the name of the material, UN number, or ERG Guide Number.

The rating numbers are similar to the NFPA 704 System, but may not use the same testing methods.

The HMIS label may include a PPE Code.
• By itself, the HMIS does not provide the name of the material, UN number, or ERG Guide Number.

• The rating numbers are similar to the NFPA 704 System, but may not use the same testing methods.

• The HMIS label may include a PPE Code
Note: Be careful as the HMIS System has been modified over the years.

You may see labels compliant with the HMIS 1 ®
HMIS 2 ®
or the LATEST:
HMIS 3 ® System
POSTER (Left) & POCKET CARDS FOR SOME VERSIONS OF HMIS-I and HMIS II
HMIS III

Hazardous Materials Identification System

- **Health Hazards**
- **Flammability**
- **Physical Hazard**
- **Personal Protection**

Health Hazard Index:
- Blood
- Eye
- Liver
- Nervous System

Personal Protection Index:
- Respiratory
- Cut skin
- Inhalation

Physical Hazard Index:
- Explosive
- Compressed Gas
- Corrosive
- Pyrophoric
- Ingestion
- Organic Peroxide

Pharmaceuticals:
HMIS III
THE HMIS SYSTEM(S)

Additional HMIS information may be found at http://www.paint.org/hmis/index.cfm

For the following slides you are to determine the risk.

In the second of each slide pair I have added any Special Hazard information.
• **Health Hazard** = ?
• **Flammability** = ?
• **Reactivity** = ?
• **Special Info?**
• Health Hazard = 3
• Flammability = 4
• Reactivity = 3
• Special Info = Code G (See the pocket card)
• Health Hazard = ?

• Flammability = ?

• Reactivity = ?

• Special Info?
• Health Hazard = 2

• Flammability = 3

• Reactivity = 0

• Special Info = Code “H”
• Health Hazard = ?
• Flammability = ?
• Reactivity = ?
• Special Info?
Health Hazard = 1
Flammability = 0
Reactivity = 0
Special Info = No Personal Protection Letter Code is used, but note the contents and potential effects do appear in the white space at the bottom.
• Health Hazard = ?

• Flammability = ?

• Reactivity = ?

• Special Info?
• **Health Hazard = 2**

• **Flammability = 4**

• **Reactivity = 1**

• **Special Info = None Noted ?**
• Health Hazard = ?

• Flammability = ?

• Reactivity = ?

• Special Info?
• Health Hazard = 1

• Flammability = 1

• Reactivity = 0

• Special Info = None Noted ?
• Health Hazard = ?
• Flammability = ?
• Reactivity = ?
• Special Info?
• Health Hazard = 4
• Flammability = 4
• Reactivity = 4
• Special Info = Code “X”
• Health Hazard = ?

• Flammability = ?

• Reactivity = ?

• Special Info?
• Health Hazard = 1

• Flammability = 3

• Reactivity = 0

• Special Info = Code C
- **Health Hazard** = ?
- **Flammability** = ?
- **Reactivity** = ?
- **Special Info?**
• Health Hazard = ?
• Flammability = ?
• Reactivity = ?
• Special Info?

This is printed in Japanese. I threw it in for a laugh.
Good luck trying to read it if you encounter one.
OTHER HAZARD IDENTIFICATION SYSTEMS
Other systems do exist!

For example, some corporations may use the “HFR” system on some of their tanks within their plants.

When this system is used within the plant the letters and numbers are **NOT** color coded
HFR EXAMPLE

If you observed the following stenciled on a bulk storage tank:

H3 F2 R1

It would mean:
Health = 3
Flammability = 2
Reactivity = 1
“HFR” SYSTEM PRACTICE

Review the following examples

H4 F4 R4
H0 F4 R0
H2 F2 R4
H1 F0 R1
H4 F4 R0
H0 F0 R0
ALDRICH PRODUCT LABELS
(Proprietary identification label ?)
A COMBINATION LABEL (Proprietary identification label ?)
The GHS (Globally Harmonized System of Classification and Labeling of Chemicals) is here!
The intent of the system is to make identifying special hazards, such as systemic toxins and aquatic pollutants easier, as well as provide instructions on appropriate protective equipment. The GHS is already in use in many countries, including the United States.

IMPORTANT: See pages 14 and 15 of the 2016 Emergency Response Guidebook for basic information.

For details on OSHA implementation of the GHS in the United States visit:

http://www.osha.gov/dsg/hazcom/
Hazard Communication Standard Labels

OSHA has updated the requirements for labeling of hazardous chemicals under its Hazard Communication Standard (HCS). All labels are required to have pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification. A sample revised HCS label, identifying the required label elements, is shown on the right. Supplemental information can also be provided on the label as needed.

For more information:

OSHA® QUICK CARD™

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)
• You find the symbol at left on a label. What does this signify?
You find the symbol at left on a label. What does this signify?

- It could signify any of the following:
  - Irritant
  - Skin sensitizer
  - Acute toxicity
  - Respiratory tract irritant
  - Hazardous to ozone layer
You find the symbol at left on a label. What does this signify?
You find the symbol at left on a label. What does this signify?

A Health Hazard such as:
- Carcinogen
- Mutagen
- Reproductive toxicity
- Respiratory sensitizer
- Target organ toxicity
- Aspiration toxicity
What is the difference between the two symbols at left?
• What is the difference between the two symbols at left?

• The top one could signify any of the following:
  – Flammables
  – Pyrophorics
  – Self heating
  – Emits flammable gas
  – Self reactives
  – Organic peroxides

• The bottom one signifies it is an oxidizer.
Hazard Communication Standard Pictogram

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Flame</th>
<th>Exclamation Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogen</td>
<td>Flammables</td>
<td>Irritant (skin and eye)</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>Pyrophobics</td>
<td>Skin Sensitizer</td>
</tr>
<tr>
<td>Reproductive Toxicity</td>
<td>Self-Heating</td>
<td>Acute Toxicity</td>
</tr>
<tr>
<td>Respiratory Sensitizer</td>
<td>Emits Flammable Gas</td>
<td>Narcotic Effects</td>
</tr>
<tr>
<td>Target Organ Toxicity</td>
<td>Self-Reactives</td>
<td>Respiratory Tract Irritant</td>
</tr>
<tr>
<td>Aspiration Toxicity</td>
<td>Organic Peroxides</td>
<td>Hazardous to Ozone Layer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Non-Mandatory)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gas Cylinder</th>
<th>Corrosion</th>
<th>Exploding Bomb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gases Under Pressure</td>
<td>Skin Corrosion/Burns</td>
<td>Explosives</td>
</tr>
<tr>
<td></td>
<td>Eye Damage</td>
<td>Self-Reactives</td>
</tr>
<tr>
<td></td>
<td>Corrosive to Metals</td>
<td>Organic Peroxides</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flame Over Circle</th>
<th>Environment</th>
<th>Skull and Crossbones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxidizers</td>
<td>(Non-Mandatory)</td>
<td>Acute Toxicity (fatal or toxic)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For more information:
- Occupational Safety and Health Administration

For details regarding the above please visit http://www.osha.gov/PublicationsHazComm_QuickCard_Pictogram.html
Proprietary GHS Samples:
The GHS

IMPORTANT:

For Information on Safety Data Sheets (formerly known as MSDS) see the next two slides and visit:

http://www.osha.gov/Publications/HazComm_QuickCard_SafetyData.html
OSHA Safety Data Sheets

Hazard Communication Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

http://www.osha.gov/Publications/HazComm_QuickCard_SafetyData.html

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OSHA Safety Data Sheets

Section 8, Exposure controls/personal protection lists OSHA’s Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical’s characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*

Section 13, Disposal considerations*

Section 14, Transport information*

Section 15, Regulatory information*

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.

See Appendix D of 1910.1200 for a detailed description of SDS contents.

http://www.osha.gov/Publications/HazComm_QuickCard_SafetyData.html
OSHA has estimated that more than 32 million workers are exposed to 650,000 hazardous chemical products in more than 3 million American workplaces. This poses a serious problem for exposed employers and their employees.

The basic goal of an effective hazard communication program is to ensure employers and employees know the identities and hazards of chemicals in their workplaces. When employers and employees have such information, it can be used to design and implement appropriate protective measures to reduce the incidence of adverse effects.

The following questions link to information that can assist employers and employees to ensure that hazard communication is properly addressed in their workplaces:

- What is hazard communication?
- What OSHA standards apply?
- Where may information for hazard determinations be found?
- What information is available regarding the elements of a hazard communication (HAZCOM) program?
- What is the Globally Harmonized System of Classification and Labeling of Chemicals?
- What additional information is available?

For more information, visit the OSHA website at http://www.osha.gov/dsg/hazcom/index2.html.
Effective Dates

The table below summarizes the phase-in dates required under the revised Hazard Communication Standard (HCS):

<table>
<thead>
<tr>
<th>Effective Completion Date</th>
<th>Requirement(s)</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1, 2013</td>
<td>Train employees on the new label elements and safety data sheet (SDS) format.</td>
<td>Employers</td>
</tr>
<tr>
<td>June 1, 2015&lt;sup&gt;*&lt;/sup&gt;</td>
<td>Compliance with all modified provisions of this final rule, except:</td>
<td>Chemical manufacturers, importers, distributors and employers</td>
</tr>
<tr>
<td>December 1, 2015</td>
<td>The Distributor shall not ship containers labeled by the chemical manufacturer or importer unless it is a GHS label.</td>
<td></td>
</tr>
<tr>
<td>June 1, 2016</td>
<td>Update alternative workplace labeling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.</td>
<td>Employers</td>
</tr>
<tr>
<td>Transition Period to the effective completion dates noted above</td>
<td>May comply with either 29 CFR 1910.1200 (the final standard), or the current standard, or both</td>
<td>Chemical manufacturers, importers, distributors, and employers</td>
</tr>
</tbody>
</table>

<sup>*</sup> Transitions for small employers are a year later than those for large employers.

For more information, visit: [http://www.osha.gov/dsg/hazcom/effectivedates.html](http://www.osha.gov/dsg/hazcom/effectivedates.html)
Intermodal Transportation Hazard Identification Issues
Intermodal Shipments …

• Can present special identification problems
Intermodal Shipments …

- Can present special identification problems
- While most fire departments will not have to deal with a sea response …
Intermodal Shipments …

• Can present special identification problems
• While most fire departments will not have to deal with a sea response …
• Your department may have to respond to a port, highway, rail, or other emergency involving intermodal containers.
Intermodal Shipments …

• Can present special identification problems
• While most fire departments will not have to deal with a sea response …
• Your department may have to respond to a port, rail, highway, or other emergency involving intermodal containers
• Therefore, take your time to properly identify the container(s) and product(s) involved.

(Some example Intermodal Shipments follow)
COFCs (Top)    TOFC (Bottom)
IM-101 (Left) and a COFC (Right)
“TCSZ” Rail Shipment
Containers on a Flatbed Trailer (Left) vs. Regular Highway Trailer (Right)
IM-101 Acid Shipment (Left)
Refrigerated IM Shipment (Right)
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