Hazardous Materials and the IFC

Quarterly Fire Marshal Training
July 16, 2013
Course Code: 8506 - - -

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Course Objectives

- The learner will be made aware of
  - 3-step process for hazardous materials code enforcement
  - Code provisions regarding Hazardous Materials including
    - Permitting thresholds and benefits or permitting
    - Maximum allowable quantities
    - The control area concept,
    - Haz-mat management plans,
    - Inventory statements, and
    - Identification systems.
Course Objectives

- The learner will be made aware of
  - changes in organized Hazardous Materials Communication programs.
  - the requirements of IFC Chapter 23, Motor Fuel-Dispensing Facilities and Repair Garages
  - the South Carolina Hydrogen Fuel Cell Program
Hazardous Materials…

- The term has different meanings to different people and organizations
- OSHA
- DOT
- EPA
- Fire Code Official
Hazardous Materials...

- Any material that is explosive, flammable, poisonous, corrosive, irritating, or otherwise harmful and likely to cause injury or death; any substance that possesses an unreasonable risk to health and safety of persons and/or the environment if it is not properly controlled during storage, manufacturing, processing, packaging, use, disposal, or transportation.
Could This Happen in Your District?
Could This Happen in Your District?
Hazardous Materials…

- Hazardous Materials can be found anywhere and everywhere.

- Where might you find the following hazardous materials?
  - Acetone
  - Acetonitrile
  - Butyl acetate
  - Dibutyl phthalate
  - Ethyl
  - Ethyl methacrylate
  - Quaternary ammonium compounds
  - Formaldehyde
  - Isopropyl acetate
  - Methacrylic Acid
  - Methyl methacrylate
  - Toluene
Hazardous Materials...

- Answer...
- Nail Salon
Hazardous Materials can be found anywhere and everywhere.

The Fire Inspector must be familiar with:
- the characteristics of hazardous materials
- the code provisions for hazardous materials
- The many hazard communication plans that exist.
To correctly apply the code, we have to answer some of the following questions:

What is the purpose of this facility?
To correctly apply the code, we have to answer some of the following questions:

What chemicals or hazardous materials will be handled here?
To correctly apply the code, we have to answer some of the following questions:

What are the maximum quantities that may exist at any one time?
To correctly apply the code, we have to answer some of the following questions:

What kind of containers and systems will be used?
Hazardous Materials...

- The Fire Inspector and the Fire Plans Reviewer are the front line defenders of the public, the employees, firefighters in the challenges to health and safety that Hazardous Materials present.

- Understanding how to apply the provisions of the IFC are paramount in an effective plan review process and inspection program.
Hazardous Materials...

- You will be made aware of Hazardous Materials in your jurisdiction in either one of the three following ways:
  - 1. The owner will make you aware of the presence and use of hazardous materials.
  - 2. You will observe them during an inspection of an existing business.
  - 3. You will be made aware of them during the plan review process.
- In any case, the steps that you will take to enforce the proper code requirements will be the same.
Hazardous Materials...

.step 1. Determine the nature and quantity of the Hazardous Materials that are involved.

.step 2. Determine if the quantity of Hazardous Materials exceeds those allowed in Table 5003.1.1.
   - If Yes, then the facility or a portion there of, will be classified as a Group H.
   - If No, then the occupancy will be classified according to the definitions of other occupancy types.
Step 3. Apply the appropriate code sections based on the Hazardous Materials, quantities, and processes involved.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- Both the International Building Code (IBC) and the International Fire Code (IFC) may be helpful in determining the nature and quantity of Hazardous Materials in any particular facility.

- Additionally, there are references to the International Mechanical Code (IMC) and to many NFPA Standards in the Hazardous Materials sections of these codes.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- The IFC applies to:
  - Structures, facilities and conditions arising after the adoption of this code.
  - Existing structures, facilities and conditions not legally in existence at the time of adoption of this code.
  - Existing structures, facilities and conditions when required in Chapter 11.
  - Existing structures, facilities and conditions which, in the opinion of the fire code official, constitute a distinct hazard to life or property.
  - Conditions and operations arising after the adoption of this code.
  - Existing conditions and operations.
The IBC applies to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- The IBC applies to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- The IBC applies to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IBC 414.1.3 Information required.**

A report shall be submitted to the building official identifying the maximum expected quantities of hazardous materials to be stored, used in a closed system and used in an open system, and subdivided to separately address hazardous material classification categories based on Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and provided without charge to the enforcing agency.
IBC 414.1.3 Information required.

A report shall be submitted to the building official identifying the maximum expected quantities of hazardous materials to be stored, used in a closed system and used in an open system, and subdivided to separately address hazardous material classification categories based on Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and provided without charge to the enforcing agency.
The requirements of the IFC begin with required operational permits as described in IFC 105.6.

105.6.1 Aerosol products. An operational permit is required to manufacture, store or handle an aggregate quantity of Level 2 or Level 3 aerosol products in excess of 500 pounds (227 kg) net weight.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **105.6.6 Combustible dust-producing operations.** An operational permit is required to operate a grain elevator, flour starch mill, feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices or sugar, or other operations producing combustible dusts as defined in Chapter 2.
105.6.7 Combustible fibers.
An operational permit is required for the storage and handling of combustible fibers in quantities greater than 100 cubic feet (2.8 m³).

Exception: A permit is not required for agricultural storage.
105.6.8 Compressed gases. An operational permit is required for the storage, use or handling at normal temperature and pressure (NTP) of compressed gases in excess of the amounts listed in Table 105.6.8.

**Exception:** Vehicles equipped for and using compressed gas as a fuel for propelling the vehicle.
**TABLE 105.6.8 PERMIT AMOUNTS FOR COMPRESSED GASES**

<table>
<thead>
<tr>
<th>TYPE OF GAS</th>
<th>AMOUNT (cubic feet at NTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosive</td>
<td>200</td>
</tr>
<tr>
<td>Flammable (except cryogenic fluids and liquefied petroleum gases)</td>
<td>200</td>
</tr>
<tr>
<td>Highly toxic</td>
<td>Any Amount</td>
</tr>
<tr>
<td>Inert and simple asphyxiants</td>
<td>6,000</td>
</tr>
<tr>
<td>Oxidizing (including oxygen)</td>
<td>504</td>
</tr>
<tr>
<td>Pyrophoric</td>
<td>Any Amount</td>
</tr>
<tr>
<td>Toxic</td>
<td>Any Amount</td>
</tr>
</tbody>
</table>
Step 1: Determine the Nature and Quantity of the Haz-Mat.

105.6.10 Cryogenic fluids. An operational permit is required to produce, store, transport on site, use, handle or dispense cryogenic fluids in excess of the amounts listed in Table 105.6.10.

Exception: Permits are not required for vehicles equipped for and using cryogenic fluids as a fuel for propelling the vehicle or for refrigerating the lading.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

### TABLE 105.6.10 PERMIT AMOUNTS FOR CRYOGENIC FLUIDS

<table>
<thead>
<tr>
<th>TYPE OF CRYOGENIC FLUID</th>
<th>INSIDE BUILDING (gallons)</th>
<th>OUTSIDE BUILDING (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable</td>
<td>More than 1</td>
<td>60</td>
</tr>
<tr>
<td>Inert</td>
<td>60</td>
<td>500</td>
</tr>
<tr>
<td>Oxidizing (includes oxygen)</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Physical or health hazard not indicated above</td>
<td>Any Amount</td>
<td>Any Amount</td>
</tr>
</tbody>
</table>
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **105.6.12 Dry cleaning.**
  An operational permit is required to engage in the business of dry cleaning or to change to a more hazardous cleaning solvent used in existing dry cleaning equipment.
105.6.14 Explosives. An operational permit is required for the manufacture, storage, handling, sale or use of any quantity of explosives, explosive materials, fireworks or pyrotechnic special effects within the scope of Chapter 56.

Exception: Storage in Group R-3 occupancies of smokeless propellant, black powder and small arms primers for personal use, not for resale and in accordance with Section 5606.
105.6.16 Flammable and combustible liquids.

An operational permit is required:
- (There are 11 cases when permits are required)

2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:

   2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the fire code official, would cause an unsafe condition.

   2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures when such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

105.6.18 Fruit and crop ripening. An operational permit is required to operate a fruit- or crop-ripening facility or conduct a fruit-ripening process using ethylene gas.
105.6.19 Fumigation and insecticidal fogging.
An operational permit is required to operate a business of fumigation or insecticidal fogging, and to maintain a room, vault or chamber in which a toxic or flammable fumigant is used.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **105.6.20 Hazardous materials.** An operational permit is required to store, transport on site, dispense, use or handle hazardous materials in excess of the amounts listed in Table 105.6.20.

- The Table is too large to be included here.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

105.6.27 LP-gas.
An operational permit is required for: 1. Storage and use of LP-gas.

Exception: A permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less or multiple container systems having an aggregate quantity not exceeding 500 gallons (1893 L), serving occupancies in Group R-3. 2. Operation of cargo tankers that transport LP-gas.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

105.6.28 Magnesium. An operational permit is required to melt, cast, heat treat or grind more than 10 pounds (4.54 kg) of magnesium.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

105.6.39 Repair garages and motor fuel-dispensing facilities. An operational permit is required for operation of repair garages, and automotive, marine and fleet motor fuel-dispensing facilities.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **105.6.41 Spraying or dipping.** An operational permit is required to conduct a spraying or dipping operation utilizing flammable or combustible liquids, or the application of combustible powders regulated by Chapter 24.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- The problem with permits...
  - We don’t adopt Chapter 1 in SC.
  - It's up to each local jurisdiction to establish its own permitting process.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**

  - **407.1 General.** The provisions of Sections 407.2 through 407.7 shall be applicable where hazardous materials subject to permits under Section 5001.5 are located on the premises or where required by the fire code official.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**

- **5001.5 Permits.**
  Permits shall be required as set forth in Sections 105.6 and 105.7.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**

- **407.2 Material Safety Data Sheets.** Material Safety Data Sheets (MSDS) for all hazardous materials shall be either readily available on the premises as a paper copy, or where approved, shall be permitted to be readily retrievable by electronic access.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**

- **407.3 Identification.**
  Individual containers of hazardous materials, cartons or packages shall be marked or labeled in accordance with applicable federal regulations. Buildings, rooms and spaces containing hazardous materials shall be identified by hazard warning signs in accordance with Section 5003.5.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**

- **5003.5 Hazard identification signs.** Unless otherwise exempted by the fire code official, visible hazard identification signs as specified in **NFPA 704** for the specific material contained shall be placed on stationary containers and above-ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the fire code official.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**

- **407.5 Hazardous Materials Inventory Statement**: Where required by the fire code official, each application for a permit shall include a Hazardous Materials Inventory Statement (HMIS) in accordance with Section 5001.5.2.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**
- **5001.5.2 Hazardous Materials Inventory Statement (HMIS).** Where required by the fire code official, an application for a permit shall include an HMIS, such as Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Tier II Report or other approved statement. The HMIS shall include the following information:
  1. Product name.
  2. Component.
  3. Chemical Abstract Service (CAS) number.
  4. Location where stored or used.
  5. Container size.
  7. Amount in storage.
  8. Amount in use-closed systems.
  9. Amount in use-open systems.
IFC 407 – Hazard Communication

407.6 Hazardous Materials Management Plan. Where required by the fire code official, each application for a permit shall include a Hazardous Materials Management Plan (HMMP) in accordance with Section 5001.5.1. The fire code official is authorized to accept a similar plan required by other regulations.
Step 1: Determine the Nature and Quantity of the Haz-Mat.

- **IFC 407 - Hazard Communication**

- **5001.5.1 Hazardous Materials Management Plan.** Where required by the fire code official, an application for a permit shall include a Hazardous Materials Management Plan (HMMP). The HMMP shall include a facility site plan designating the following:
  > 1. Access to each storage and use area.
  > 2. Location of emergency equipment.
  > 3. Location where liaison will meet emergency responders.
  > 4. Facility evacuation meeting point locations.
  > 5. The general purpose of other areas within the building.
  > 6. Location of all above-ground and underground tanks and their appurtenances including, but not limited to, sumps, vaults, below-grade treatment systems and piping.
  > 7. The hazard classes in each area.
  > 8. Locations of all control areas and Group H occupancies.
Both the IBC and the IFC give us tools and enforcement mechanisms for determining the nature and quantity of hazardous materials found to exist in any structure or premises.

Next we will determine the occupancy group of the structure. Is it a Group H?
Not all buildings that contain Hazardous Materials are Group H. Only those that have quantities that exceed those in Table 5003.1.1.

5001.1 Scope.
Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that when specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.
Step 2: Determining Occupancy Group based on Quantity

- **5003.1.1 Maximum allowable quantity per control area.**
  The maximum allowable quantity per control area shall be as specified in Tables 5003.1.1(1) through 5003.1.1(4).

- For retail and wholesale storage and display in Group M occupancies and Group S storage, see Section 5003.11.

- Make sure to read the footnotes.
5003.1.1 Maximum allowable quantity per control area.
The maximum allowable quantity per control area shall be as specified in Tables 5003.1.1(1) through 5003.1.1(4).

For retail and wholesale storage and display in Group M occupancies and Group S storage, see Section 5003.11.

Make sure to read the footnotes.
5003.8 Construction requirements. Buildings, control areas, enclosures and cabinets for hazardous materials shall be in accordance with Sections 5003.8.1 through 5003.8.6.3.
Step 2: Determining Occupancy Group based on Quantity

- **5003.8.3 Control areas.** Control areas shall comply with Sections 5003.8.3.1 through 5003.8.3.5.

- **5003.8.3.1 Construction requirements.** Control areas shall be separated from each other by fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.
5003.8.3 Control areas. Control areas shall comply with Sections 5003.8.3.1 through 5003.8.3.5.

5003.8.3.2 Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per control area allowed at each floor level within a building shall be in accordance with Table 5003.8.3.2.
<table>
<thead>
<tr>
<th>FLOOR LEVEL</th>
<th>PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA&lt;sup&gt;a&lt;/sup&gt;</th>
<th>NUMBER OF CONTROL AREAS PER FLOOR</th>
<th>FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above grade plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher than 9</td>
<td>5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7-9</td>
<td>5 12.5</td>
<td>2 2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>12.5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>12.5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below grade plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>75</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lower than 2</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>
Step 2: Determining Occupancy Group based on Quantity

- **Example:**
  - What is the maximum allowable quantity per control area for a Flammable IA Liquid used in an open system?
    - Table 5003.1.1 - 30 gallons
  - What if the building is sprinklered?
    - Footnote d. - 100% Increase - 60 gallons
  - How many control areas can we have on the first floor of the building?
    - Table 5003.8.3.2 - 4 control areas
  - What % of max in each control area?
    - Table 5003.8.3.2 - 100% - 240 gallons
5003.1.3 Quantities not exceeding the maximum allowable quantity per control area.

The storage, use and handling of hazardous materials in quantities not exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be in accordance with Sections 5001 and 5003.
5003.1.4 Quantities exceeding the maximum allowable quantity per control area.
The storage and use of hazardous materials in quantities exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be in accordance with this chapter.
Step 2: Determining Occupancy Group based on Quantity

- If the quantities exceed the MAQ and limit on control areas can’t be met, then the facility must be designed to meet the requirements for an H Occupancy.

- Once designed and constructed to meet the requirements of an H Occupancy, then chemicals are not limited.
High Hazard Group H Occupancy

- In Chapter 2 of the IFC, we learn that Group H occupancies are those in which quantities of hazardous materials exceed the maximum allowable quantity found in table 5003.1.1.

- We also see that there are 13 exceptions to the Group H classification.
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the International Building Code.

1. Chapter 24 – Flammable Finishes
2. IBC 416 – Application of Flammable Finishes
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to Chapter 57.

Chapter 57 – Flammable and Combustible Liquids
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers in accordance with Section 707 of the International Building Code or 1-hour horizontal assemblies in accordance with Section 711 of the International Building Code, or both.
High Hazard Group H Occupancy - EXCEPTIONS

Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
7. Refrigeration systems.
High Hazard Group H Occupancy - EXCEPTIONS

Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

8. The storage or utilization of materials for agricultural purposes on the premises.

9. Stationary batteries utilized for facility emergency power, uninterruptible power supply or telecommunication facilities, provided that the batteries are equipped with safety venting caps and ventilation is provided in accordance with the International Mechanical Code.
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

10. Corrosives shall not include personal or household products in their original packaging used in retail display or commonly used building materials.

11. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

12. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 5003.8.3.5.
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

5003.8.3.5 Hazardous material in Group M display and storage areas and in Group S storage areas. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed within a single control area of a Group M display and storage area or a Group S storage area is allowed to exceed the maximum allowable quantities per control area specified in Tables 5003.1.1(1) and 5003.1.1(2) without classifying the building or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with Section 5003.11.
Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

13. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements of this code.
High Hazard Group H Occupancy

Hazardous Occupancies are classified in Groups H-1, H-2, H-3, H-4, and H-5.

- **H-1**: detonation hazards such as
  - Detonable pyrophoric materials
  - Explosives (Divisions 1.1 – 1.6)
  - Organic peroxides (unclassified detonable)
  - Oxidizers (Class 4)
  - Unstable materials (reactive), (Class 3 detonable, Class 4)
Hazardous Occupancies are classified in Groups H-1, H-2, H-3, H-4, and H-5.

- **H-2**: deflagration hazards or accelerated burning
  - Class I, II, IIIA flammable or combustible liquids in open containers or systems or closed systems at pressures greater than 15 psi.
  - Combustible dusts
  - Cryogenic fluids that are flammable
  - Flammable gases
  - Organic peroxides, Class 1
  - Oxidizers, Class 3
  - Pyrophoric Liquids, solids, and gases that are nondetonable
  - Unstable materials (reactive), Class 3 nondetonable
  - Water-reactive materials, Class 3
Hazardous Occupancies are classified in Groups H-1, H-2, H-3, H-4, and H-5.

- **H-3**: materials that readily support combustion or that pose a physical hazard
  - Class I, II, and IIIA flammable or combustible liquids that are stored in closed containers or systems pressurized at 15 psi or less.
  - Combustible fibers, other than baled cotton
  - Consumer fireworks, 1.4G (Class C, Common)
  - Cryogenic fluids, oxidizing
  - Flammable solids
  - Organic peroxides, Class II and III
  - Oxidizers, Class 2
  - Oxidizers, Class 3 stored in closed containers or systems of greater than 15 psi
  - Oxidizing gases
  - Unstable materials (reactive), Class 2
  - Water-reactive materials, Class 2
Hazardous Occupancies are classified in Groups H-1, H-2, H-3, H-4, and H-5.

- **H-4**: materials that are health hazards
  - Corrosives
  - Highly-toxic materials
  - Toxic materials
Hazardous Occupancies are classified in Groups H-1, H-2, H-3, H-4, and H-5.

- H-5: Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used in aggregate quantities greater than the maximum allowed by table 5003.1.1.
Questions?
Still must meet the requirements of the IFC 5001 and 5003 as well as special material or process specific requirements found in Chapters 51-67.

5001.5 Permits.
Permits shall be required as set forth in Sections 105.6 and 105.7.

When required by the fire code official, permittees shall apply for approval to permanently close a storage, use or handling facility.
5001.5.1 Hazardous Materials Management Plan. Where required by the fire code official, an application for a permit shall include a Hazardous Materials Management Plan (HMMP). The HMMP shall include a facility site plan designating the following:

- 1. Access to each storage and use area.
- 2. Location of emergency equipment.
- 3. Location where liaison will meet emergency responders.
- 4. Facility evacuation meeting point locations.
- 5. The general purpose of other areas within the building.
- 6. Location of all above-ground and underground tanks and their appurtenances including, but not limited to, sumps, vaults, below-grade treatment systems and piping.
- 7. The hazard classes in each area.
- 8. Locations of all control areas and Group H occupancies.
Step 3. Apply the appropriate code sections – not Group H

- **5001.5.2 Hazardous Materials Inventory Statement (HMIS).**
  Where required by the fire code official, an application for a permit shall include an HMIS, such as Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Tier II Report or other approved statement. The HMIS shall include the following information:
  
  1. Product name.
  2. Component.
  3. Chemical Abstract Service (CAS) number.
  4. Location where stored or used.
  5. Container size.
  7. Amount in storage.
  8. Amount in use-closed systems.
  9. Amount in use-open systems.
5001.6 Facility closure. Facilities shall be placed out of service in accordance with Sections 5001.6.1 through 5001.6.3.

- 5001.6.1 Temporarily out-of-service facilities.
- 5001.6.2 Permanently out-of-service facilities.
- 5001.6.3 Facility closure plan.
Step 3. Apply the appropriate code sections – not Group H

- **5003.2 Systems, equipment and processes.** Systems, equipment and processes utilized for storage, dispensing, use or handling of hazardous materials shall be in accordance with Sections 5003.2.1 through 5003.2.8.
  - 5003.2.1 Design and construction of containers, cylinders and tanks.
  - 5003.2.2 Piping, tubing, valves and fittings.
  - 5003.2.3 Equipment, machinery and alarms.
  - 5003.2.4 Installation of tanks.
  - 5003.2.5 Empty containers and tanks.
  - 5003.2.6 Maintenance.
  - 5003.2.7 Liquid-level limit control.
  - 5003.2.8 Seismic protection.
  - 5003.2.9 Testing.
Step 3. Apply the appropriate code sections – not Group H

- **5003.3 Release of hazardous materials.** Hazardous materials in any quantity shall not be released into a sewer, storm drain, ditch, drainage canal, creek, stream, river, lake or tidal waterway or on the ground, sidewalk, street, highway or into the atmosphere.

- **Exceptions:**
  > 1. The release or emission of hazardous materials is allowed when in compliance with federal, state or local governmental agencies, regulations or permits.
  > 2. The release of pesticides is allowed when used in accordance with registered label directions.
  > 3. The release of fertilizer and soil amendments is allowed when used in accordance with manufacturer’s specifications.
Step 3. Apply the appropriate code sections – not Group H

- **5003.4 Material Safety Data Sheets.** Material Safety Data Sheets (MSDS) shall be readily available on the premises for hazardous materials regulated by this chapter. When a hazardous substance is developed in a laboratory, available information shall be documented.

**Exception:** Designated hazardous waste.
5003.5 Hazard identification signs. Unless otherwise exempted by the fire code official, visible hazard identification signs as specified in NFPA 704 for the specific material contained shall be placed on:

- stationary containers and
- above-ground tanks and
- at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and
- at specific entrances and locations designated by the fire code official.
Step 3. Apply the appropriate code sections – not Group H
Step 3. Apply the appropriate code sections – not Group H

- **5003.5.1 Markings.**
  Individual containers, cartons or packages shall be conspicuously marked or labeled in an approved manner. Rooms or cabinets containing compressed gases shall be conspicuously labeled: COMPRESSED GAS.
Step 3. Apply the appropriate code sections – not Group H

5003.6 Signs.
Signs and markings required by Sections 5003.5 and 5003.5.1 shall not be obscured or removed, shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size, color and lettering shall be approved.
Step 3. Apply the appropriate code sections – not Group H

5003.7.1 Smoking.
Smoking shall be prohibited and "No Smoking" signs provided as follows:

1. In rooms or areas where hazardous materials are stored or dispensed or used in open systems in amounts requiring a permit in accordance with Section 5001.5.
2. Within 25 feet (7620 mm) of outdoor storage, dispensing or open use areas.
3. Facilities or areas within facilities that have been designated as totally "no smoking" shall have "No Smoking" signs placed at all entrances to the facility or area. Designated areas within such facilities where smoking is permitted either permanently or temporarily, shall be identified with signs designating that smoking is permitted in these areas only.
4. In rooms or areas where flammable or combustible hazardous materials are stored, dispensed or used.
Step 3. Apply the appropriate code sections – not Group H

- **5003.7.2 Open flames.**
  Open flames and high-temperature devices shall not be used in a manner which creates a hazardous condition and shall be listed for use with the hazardous materials stored or used.
5003.7.3 Industrial trucks.
Powered industrial trucks used in areas designated as hazardous (classified) locations in accordance with NFPA 70 shall be listed and labeled for use in the environment intended in accordance with NFPA 505.

Step 3. Apply the appropriate code sections – not Group H
Step 3. Apply the appropriate code sections – not Group H

- **5003.9.1 Personnel training and written procedures.** Persons responsible for the operation of areas in which hazardous materials are stored, dispensed, handled or used shall be familiar with the chemical nature of the materials and the appropriate mitigating actions necessary in the event of fire, leak or spill.
Step 3. Apply the appropriate code sections – not Group H

- **5003.9.2 Security.**
  Storage, dispensing, use and handling areas shall be secured against unauthorized entry and safeguarded in a manner approved by the fire code official.
Step 3. Apply the appropriate code sections – not Group H

5003.9.3 Protection from vehicles.
Guard posts or other approved means shall be provided to protect storage tanks and connected piping, valves and fittings; dispensing areas; and use areas subject to vehicular damage in accordance with Section 312.
Step 3. Apply the appropriate code sections – not Group H

- **5003.9.5 Static accumulation.**
  When processes or conditions exist where a flammable mixture could be ignited by static electricity, means shall be provided to prevent the accumulation of a static charge.

- **5003.9.6 Protection from light.**
  Materials that are sensitive to light shall be stored in containers designed to protect them from such exposure.
Step 3. Apply the appropriate code sections – not Group H

5003.9.7 Shock padding. Materials that are shock sensitive shall be padded, suspended or otherwise protected against accidental dislodgement and dislodgement during seismic activity.
5003.9.8 Separation of incompatible materials. Incompatible materials in storage and storage of materials that are incompatible with materials in use shall be separated when the stored materials are in containers having a capacity of more than 5 pounds (2 kg) or 0.5 gallon (2 L). Separation shall be accomplished by:

1. Segregating incompatible materials in storage by a distance of not less than 20 feet (6096 mm).
2. Isolating incompatible materials in storage by a noncombustible partition extending not less than 18 inches (457 mm) above and to the sides of the stored material.
3. Storing liquid and solid materials in hazardous material storage cabinets.
4. Storing compressed gases in gas cabinets or exhausted enclosures in accordance with Sections 5003.8.5 and 5003.8.6. Materials that are incompatible shall not be stored within the same cabinet or exhausted enclosure.
5003.9.9 Shelf storage. Shelving shall be of substantial construction, and shall be braced and anchored in accordance with the seismic design requirements of the International Building Code for the seismic zone in which the material is located. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard when used for the storage of individual containers. Shelf storage of hazardous materials shall be maintained in an orderly manner.
Step 3. Apply the appropriate code sections – not Group H

5003.10.1 Valve protection. Hazardous material gas containers, cylinders and tanks in transit shall have their protective caps in place. Containers, cylinders and tanks of highly toxic or toxic compressed gases shall have their valve outlets capped or plugged with an approved closure device in accordance with Chapter 53.
5003.10.2 Carts and trucks required.
Liquids in containers exceeding 5 gallons (19 L) in a corridor or enclosure for a stairway or ramp shall be transported on a cart or truck. Containers of hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 and transported within corridors or interior exit stairways and ramps, shall be on a cart or truck. Where carts and trucks are required for transporting hazardous materials, they shall be in accordance with Section 5003.10.3.
Step 3. Apply the appropriate code sections – Group H

- When the storage, use, and handling of Hazardous Materials exceed those allowed in Table 5003.1.1, the building or portion thereof is classified as a Group H occupancy.

- There is no limit to the amount of Hazardous Materials that can be stored at that point.
Step 3. Apply the appropriate code sections – Group H

- Limited Heights and Areas
- Restrictive construction types
- Minimum distance to the property line is greater.
- Buildings with H-1, H-2 or H-3 occupancies cannot be used for another purpose, shall not exceed 1 story and basements or underfloor spaces are prohibited.
Step 3. Apply the appropriate code sections – Group H

- Smoke and Heat Vents
- Ventilation
- Explosion Control and Venting
- Detached Storage
- Building Separation Distances
- Fire Suppression Systems
- IFC Hazardous Materials and hazard specific requirements
Step 3. Apply the appropriate code sections – Group H

- IFC Chapter 50
- Sections 5001 and 5003
- Sections 5004 – Storage of Haz-Mat exceeding the MAQ
- Section 5005 – Use, Dispensing, and Handling of Haz-Mat exceeding the MAQ
- Special material or process specific requirements found in IFC Chapters 51-67
Step 3. Apply the appropriate code sections – Group H

- **5004.2 Spill control and secondary containment for liquid and solid hazardous materials.**
  Rooms, buildings or areas used for the storage of liquid or solid hazardous materials shall be provided with spill control and secondary containment in accordance with Sections 5004.2.1 through 5004.2.3.

**Exception:** Outdoor storage of containers on approved containment pallets in accordance with Section 5004.2.3.
5004.2.1 Spill control for hazardous material liquids.
Rooms, buildings or areas used for the storage of hazardous material liquids in individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L), shall be provided with spill control to prevent the flow of liquids to adjoining areas.
5004.2.1 Spill control for hazardous material liquids.

Floors in indoor locations and similar surfaces in outdoor locations shall be constructed to contain a spill from the largest single vessel by one of the following methods: 1. Liquid-tight sloped or recessed floors in indoor locations or similar areas in outdoor locations. 2. Liquid-tight floors in indoor locations or similar areas in outdoor locations provided with liquid-tight raised or recessed sills or dikes. 3. Sumps and collection systems. 4. Other approved engineered systems.
3. Apply the appropriate code sections – Group H

5004.2.1 Spill control for hazardous material liquids.

Except for surfacing, the floors, sills, dikes, sumps and collection systems shall be constructed of noncombustible material, and the liquid-tight seal shall be compatible with the material stored. When liquid-tight sills or dikes are provided, they are not required at perimeter openings having an open-grate trench across the opening that connects to an approved collection system.
Step 3. Apply the appropriate code sections – Group H

- 5004.2.2 Secondary containment for hazardous material liquids and solids.
  - Containment and drainage methods
  - Incompatible materials
  - Indoor design
  - Outdoor design
  - Monitoring
  - Drainage System Design

- 5004.2.3 Containment pallets.
Step 3. Apply the appropriate code sections – Group H

5004.3 Ventilation.
Indoor storage areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation where natural ventilation can be shown to be acceptable for the materials as stored.

Exception: Storage areas for flammable solids complying with Chapter 59.
Step 3. Apply the appropriate code sections – Group H

5004.4 Separation of incompatible hazardous materials.
Incompatible materials shall be separated in accordance with **Section 5003.9.8.**
5003.9.8 Separation of incompatible materials. Incompatible materials in storage and storage of materials that are incompatible with materials in use shall be separated when the stored materials are in containers having a capacity of more than 5 pounds (2 kg) or 0.5 gallon (2 L). Separation shall be accomplished by:

1. Segregating incompatible materials in storage by a distance of not less than 20 feet (6096 mm).
2. Isolating incompatible materials in storage by a noncombustible partition extending not less than 18 inches (457 mm) above and to the sides of the stored material.
3. Storing liquid and solid materials in hazardous material storage cabinets.
4. Storing compressed gases in gas cabinets or exhausted enclosures in accordance with Sections 5003.8.5 and 5003.8.6. Materials that are incompatible shall not be stored within the same cabinet or exhausted enclosure.
5004.5 Automatic sprinkler systems.
Indoor storage areas and storage buildings shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. The design of the sprinkler system shall not be less than that required for Ordinary Hazard Group 2 with a minimum design area of 3,000 square feet (279 m²). Where the materials or storage arrangement are required by other regulations to be provided with a higher level of sprinkler system protection, the higher level of sprinkler system protection shall be provided.
Step 3. Apply the appropriate code sections – Group H

5004.6 Explosion control.
Indoor storage rooms, areas and buildings shall be provided with explosion control in accordance with Section 911.
911.1 General. Explosion control shall be provided in the following locations:

1. Where a structure, room or space is occupied for purposes involving explosion hazards as identified in Table 911.1.

2. Where quantities of hazardous materials specified in Table 911.1 exceed the maximum allowable quantities in Table 5003.1.1(1).

Such areas shall be provided with explosion (deflagration) venting, explosion (deflagration) prevention systems, or barricades in accordance with this section and NFPA 69, or NFPA 495 as applicable. Deflagration venting shall not be utilized as a means to protect buildings from detonation hazards.
5004.7 **Standby or emergency power.** Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with NFPA 70 and Section 604.

There are 6 exceptions here so read those before requiring standby or emergency power systems.
5004.8 Limit controls.
Limit controls shall be provided in accordance with Sections 5004.8.1 and 5004.8.2.

5004.8.1 Temperature control.
Materials that must be kept at temperatures other than normal ambient temperatures to prevent a hazardous reaction shall be provided with an approved means to maintain the temperature within a safe range. Redundant temperature control equipment that will operate on failure of the primary temperature control system shall be provided. Where approved, alternative means that prevent a hazardous reaction are allowed.
Step 3. Apply the appropriate code sections – Group H

- **5004.8 Limit controls.**
  Limit controls shall be provided in accordance with Sections 5004.8.1 and 5004.8.2.

  - **5004.8.2 Pressure control.**
    Stationary tanks and equipment containing hazardous material liquids that can generate pressures exceeding design limits because of exposure fires or internal reaction shall have some form of construction or other approved means that will relieve excessive internal pressure. The means of pressure relief shall vent to an approved location or to an exhaust scrubber or treatment system where required by Chapter 60.
5004.9 Emergency alarm.
An approved manual emergency alarm system shall be provided in buildings, rooms or areas used for storage of hazardous materials. Emergency alarm-initiating devices shall be installed outside of each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials.
5004.10 Supervision and monitoring. Emergency alarm, detection and automatic fire-extinguishing systems required by Section 5004 shall be electrically supervised and monitored by an approved supervising station or, when approved, shall initiate an audible and visual signal at a constantly attended on-site location.
5004.11 Clearance from combustibles.
The area surrounding an outdoor storage area or tank shall be kept clear of combustible materials and vegetation for a minimum distance of 25 feet (7620 mm).

5004.12 Noncombustible floor.
Except for surfacing, floors of storage areas shall be of noncombustible construction.
Step 3. Apply the appropriate code sections – Group H

- **5005 Use, Dispensing, and Handling**
- **5005.1 General.**

Use, dispensing and handling of hazardous materials in amounts exceeding the maximum allowable quantity per control area set forth in Section 5003.1 shall be in accordance with Sections 5001, 5003 and 5005. Use, dispensing and handling of hazardous materials in amounts not exceeding the maximum allowable quantity per control area set forth in Section 5003.1 shall be in accordance with Sections 5001 and 5003.
5005.2 Indoor dispensing and use. Indoor dispensing and use of hazardous materials shall be in buildings complying with the International Building Code and in accordance with Section 5005.1 and Sections 5005.2.1 through 5005.2.2.4.

- 5005.2.1 Open systems.
  - 5005.2.1.1 Ventilation.
  - 5005.2.1.2 Explosion control.
  - 5005.2.1.3 Spill control for hazardous material liquids.
  - 5005.2.1.4 Secondary containment for hazardous material liquids.

- 5005.2.2 Closed systems.
  - 5005.2.2.1 Ventilation.
  - 5005.2.2.2 Explosion control.
  - 5005.2.2.3 Spill control for hazardous material liquids
  - 5005.2.2.4 Secondary containment for hazardous material liquids.
Step 3. Apply the appropriate code sections – Group H

5005.3 Outdoor dispensing and use. Dispensing and use of hazardous materials outdoors shall be in accordance with Sections 5005.3.1 through 5005.3.9.

- 5005.3.1 Quantities exceeding the maximum allowable quantity per control area.
- 5005.3.2 Quantities not exceeding the maximum allowable quantity per control area.
- 5005.3.3 Location.
- 5005.3.4 Spill control for hazardous material liquids in open systems.
- 5005.3.5 Secondary containment for hazardous material liquids in open systems.
- 5005.3.6 Spill control for hazardous material liquids in closed systems.
- 5005.3.7 Secondary containment for hazardous material liquids in closed systems.
- 5005.3.8 Clearance from combustibles.
- 5005.3.9 Weather protection.
Step 3. Apply the appropriate code sections – Group H

- 5005.4 Handling.
  Handling of hazardous materials shall be in accordance with Sections 5005.4.1 through 5005.4.4.

  > 5005.4.1 Quantities exceeding the maximum allowable quantity per control area.
  Handling of hazardous materials in indoor and outdoor locations in amounts exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be in accordance with Sections 5001, 5003, 5005.1 and 5005.4.
Step 3. Apply the appropriate code sections – Group H

- **5005.4 Handling.**
  Handling of hazardous materials shall be in accordance with Sections 5005.4.1 through 5005.4.4.

  - **5005.4.2 Quantities not exceeding the maximum allowable quantity per control area.**
    Handling of hazardous materials in indoor locations in amounts not exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) and 5003.1.1(2) shall be in accordance with Sections 5001, 5003 and 5005.1. Handling of hazardous materials in outdoor locations in amounts not exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(3) and 5003.1.1(4) shall be in accordance with Sections 5001 and 5003.
5005.4 Handling. Handling of hazardous materials shall be in accordance with Sections 5005.4.1 through 5005.4.4.

5005.4.3 Location. Outdoor handling areas for hazardous materials shall be located as required for outdoor storage in accordance with Section 5004.
5005.4 Handling.
Handling of hazardous materials shall be in accordance with Sections 5005.4.1 through 5005.4.4.

5005.4.4 Dispensing, use and handling.
Where hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 are transported through corridors, interior exit stairways or ramps or exit passageways, there shall be an emergency telephone system, a local manual alarm station or an approved alarm-initiating device at not more than 150-foot (45 720 mm) intervals and at each exit and exit access doorway throughout the transport route. The signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall also initiate a local audible alarm.
Additional hazard specific requirements based on the function of the facility and types of hazards present:

Read the Scope of each chapter to determine applicability.
Step 3. Apply the appropriate code sections

Special Occupancies and Operations

- Chapter 20 – Aviation Facilities
- Chapter 21 – Dry Cleaners
- Chapter 22 – Combustible Dust-Producing Operations
- Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages
- Chapter 24 – Flammable Finishes
- Chapter 25 – Fruit and Crop Ripening
- Chapter 26 – Fumigation and Insecticidal Fogging
- Chapter 27 – Semiconductor Fabrication Facilities
- Chapter 28 – Lumber Yards and Woodworking Facilities
- Chapter 29 – Manufacture of Organic Coatings
- Chapter 30 – Industrial Ovens
- Chapter 31 – Tents and Membrane Structures
- Chapter 32 – High Piled Combustible Storage
- Chapter 33 – Fire Safety During Construction and Demolition
- Chapter 34 – Tire Rebuilding and Tire Storage
- Chapter 35 – Welding and Other Hot Work
- Chapter 36 – Marinas
Step 3. Apply the appropriate code sections

- Hazardous Materials
  - Chapter 51 – Aerosols
  - Chapter 52 – Combustible Fibers
  - Chapter 53 – Compressed Gases
  - Chapter 54 – Corrosive Materials
  - Chapter 55 – Cryogenic Fluids
  - Chapter 56 – Explosives and Fireworks
  - Chapter 57 – Flammable and Combustible Liquids
  - Chapter 58 – Flammable Gasses and Flammable Cryogenic Fluids
  - Chapter 59 – Flammable Solids
  - Chapter 60 – Highly Toxic and Toxic Materials
  - Chapter 61 – Liquefied Petroleum Gases
  - Chapter 62 – Organic Peroxides
  - Chapter 63 – Oxidizers, Oxidizing Gases, and Oxidizing Cryogenic Fluids
  - Chapter 64 – Pyrophoric Materials
  - Chapter 65 – Proxylin (Cellulose Nitrate) Plastics
  - Chapter 66 – Unstable (Reactive) Materials
  - Chapter 67 – Water-Reactive Solids and Liquids
Questions?
Application: What to do now...

- Realize that most every building has some amount of some type of Hazardous Materials.
Application: What to do now...

- Step 1: Recognize the hazardous materials and determine the quantities that are present.

- Quantities matter for 2 reasons:
  1. Maximum Allowable Quantities per control area is used to determine the occupancy class.
  2. Quantities are also used to determine if a permit is required.
Permits are an important part of the Hazardous Materials code enforcement program because:

1. It proactively involves the owner in the code enforcement process. It places the burden of identifying and declaring hazardous materials on the owner/operator of the site.

2. It provides clear justification for inspection and right of entry.

3. You gain valuable information needed to determine compliance with other sections of the code such as HMIS and HMMP.
Application: What to do now...

- Even without a Hazardous Materials Permitting program, the Fire Code Official may still require the completion of the HMIS and HMMP.

- Appendix H provides instructions for completing the HMIS and HMMP including sample forms.
Application: What to do now...

- **Step 2:** Use the maximum quantities of hazardous materials to determine the facilities Occupancy Group.

- **Step 3:** Use the appropriate code sections for prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials.
Questions?
Hazard Communication

- Sweeping changes are taking place in the world of hazardous material shipping, handling, and workplace hazard communication.

- These global initiatives will effect not only the occupational sector, but also code enforcement officials and emergency responders.
Hazard Communication

- The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) was developed to streamline the global transportation and workplace handling of hazardous materials.

  - Purple Book
  - Adopted by OSHA... considered as law
The new GHS includes:

- Revised definitions and classification methods
- Revision of packaging labeling
- New Safety Data Sheets (SDS) that replaces MSDS.
Hazard Communication

☉ Of note for both Code Officials and Emergency First Responders:
  > The GHS Labeling and Safety Data Sheets,
  > the IFC/NFPA 704 Markings,
  > the Hazardous Material Information System (HMIS) and
  > the DOT (Orange Emergency Response Guide) Labeling and Markings are all different systems that are not equal, nor are they transposable.
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.
New Hazard Communication Safety Data Sheets (SDS):

- **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.
New Hazard Communication Safety Data Sheets (SDS):

- **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.
New Hazard Communication Safety Data Sheets (SDS):

- **Section 12, Ecological information**, Information to assist in the evaluation of the environmental impact of the material and/or its components if released to the environment is provided in this section. Ecotoxicity, persistence / degradability, bioaccumulation / accumulation, mobility in environmental media and other adverse effects may be addressed.

- **Section 13, Disposal considerations**, Provides information that may be useful in the proper disposal, recycling or reclamation of the material and/or its container.

- **Section 14, Transport information**, Basic classification information and special precautionary information to help a knowledgeable user prepare a material for shipment is given in this section. This section is not intended to contain every regulatory detail involving the transportation of a material.
Section 15, Regulatory Information, Information on the regulatory status that is useful for compliance with health, safety and environmental regulations. Content and organization of this section depends on where the material is manufactured or used. It is not intended to be a comprehensive list of all of the regulations that may apply. U.S. Federal regulations/agencies shown may include the following: Clean Air Act (CAA), Clean Water Act (CWA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Drug Enforcement Administration (DEA), Food and Drug Administration (FDA), OSHA, Safe Drinking Water Act (SDWA), Superfund Amendments and Reauthorization Act (SARA) Title III, Toxic Substances Control Act (TSCA) and United States Department of Agriculture (USDA).
New Hazard Communication Safety Data Sheets (SDS):

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

- **Employers must ensure that SDSs are readily accessible to employees.** See Appendix D of 1910.1200 for a detailed description of SDS contents.
GHS Label Elements

Product Name or Identifier
(Identify Hazardous Ingredients, where appropriate)

See 1.4.10.6.2 (c)
and Annexes 1, 2

Signal Word

See 1.4.10.6.2 (a)

Physical, Health, Environmental Hazard Statements

See 1.4.10.6.2 (b)
and Annexes 1, 2

Supplemental Information

See 1.4.10.6.2 (c) and Annex 3

Precautionary Measures & Pictograms

First Aid Statements

See 1.4.10.6.2 (c) and Annex 3

Name and Address of Company

See 1.4.10.6.2 (e)

Telephone Number

See 1.4.10.6.2 (e)
Figure 4.9
GHS Pictograms and Hazard Classes

- Oxidizers
- Flammables
  - Self Reactives
  - Pyrophorics
  - Self-Heating
  - Emits Flammable Gas
  - Organic Peroxides
- Explosives
  - Self Reactives
  - Organic Peroxides

- Acute toxicity (severe)
- Corrosives
- Gases Under Pressure
- Carcinogen
  - Respiratory Sensitizer
  - Reproductive Toxicity
  - Target Organ Toxicity
- Environmental Toxicity
- Irritant
  - Dermal Sensitizer
  - Acute toxicity (harmful)
  - Narcotic Effects
Hazard Communication

- For more information on the new GHS, visit:

https://www.osha.gov/dsg/hazcom/ghs.html#4.3
Questions?
IFC Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages
2301.1 Scope. Automotive motor fuel-dispensing facilities, marine motor fuel-dispensing facilities, fleet vehicle motor fuel-dispensing facilities, aircraft motor-vehicle fuel-dispensing facilities and repair garages shall be in accordance with this chapter and the International Building Code, International Fuel Gas Code and International Mechanical Code. Such operations shall include both those that are accessible to the public and private operations.
2301.2 Permits. Permits shall be required as set forth in Section 105.6.

2301.3 Construction documents. Construction documents shall be submitted for review and approval prior to the installation or construction of automotive, marine or fleet vehicle motor fuel-dispensing facilities and repair garages in accordance with Section 105.4.
2301.4 Indoor motor fuel-dispensing facilities. Motor fuel-dispensing facilities located inside buildings shall comply with the International Building Code and NFPA 30A.

2301.4.1 Protection of floor openings in indoor motor fuel-dispensing facilities. Where motor fuel-dispensing facilities are located inside buildings and the dispensers are located above spaces within the building, openings beneath dispensers shall be sealed to prevent the flow of leaked fuel to lower building spaces.
IFC Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages

2301.5 Electrical. Electrical wiring and equipment shall be suitable for the locations in which they are installed and shall comply with Section 605, NFPA 30A and NFPA 70.

2301.6 Heat-producing appliances. Heat-producing appliances shall be suitable for the locations in which they are installed and shall comply with NFPA 30A and the International Fuel Gas Code or the International Mechanical Code.

NFPA 30A – Code for Motor Fuel-Dispensing Facilities and Repair Garages
2303.1 Location of dispensing devices. Dispensing devices shall be located as follows:

1. Ten feet (3048 mm) or more from lot lines.
2. Ten feet (3048 mm) or more from buildings having combustible exterior wall surfaces or buildings having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly or buildings having combustible overhangs.

Exception: Canopies constructed in accordance with the International Building Code providing weather protection for the fuel islands.

3. Such that all portions of the vehicle being fueled will be on the premises of the motor fuel-dispensing facility.
4. Such that the nozzle, when the hose is fully extended, will not reach within 5 feet (1524 mm) of building openings.
5. Twenty feet (6096 mm) or more from fixed sources of ignition.
2303.2 Emergency disconnect switches. An approved, clearly identified and readily accessible emergency disconnect switch shall be provided at an approved location to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. An emergency disconnect switch for exterior fuel dispensers shall be located within 100 feet (30 480 mm) of, but not less than 20 feet (6096 mm) from, the fuel dispensers. For interior fuel-dispensing operations, the emergency disconnect switch shall be installed at an approved location. Such devices shall be distinctly labeled as: EMERGENCY FUEL SHUTOFF. Signs shall be provided in approved locations.
2304.1 Supervision of dispensing.
The dispensing of fuel at motor fuel-dispensing facilities shall be conducted by a qualified attendant or shall be under the supervision of a qualified attendant at all times or shall be in accordance with Section 2304.3.
2304.2 Attended self-service motor fuel-dispensing facilities.

Attended self-service motor fuel-dispensing facilities shall comply with Sections 2304.2.1 through 2304.2.5. Attended self-service motor fuel-dispensing facilities shall have at least one qualified attendant on duty while the facility is open for business. The attendant’s primary function shall be to supervise, observe and control the dispensing of fuel. The attendant shall prevent the dispensing of fuel into containers that do not comply with Section 2304.4.1, control sources of ignition, give immediate attention to accidental spills or releases, and be prepared to use fire extinguishers.
2304.2.2 Emergency controls. Approved emergency controls shall be provided in accordance with Section 2303.2.

2304.2.3 Operating instructions. Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser.

2304.2.4 Obstructions to view. Dispensing devices shall be in clear view of the attendant at all times. Obstructions shall not be placed between the dispensing area and the attendant.
(IFC Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages)

**2304.2.5 Communications.** The attendant shall be able to communicate with persons in the dispensing area at all times. An approved method of communicating with the fire department shall be provided for the attendant.
2304.3 Unattended self-service motor fuel-dispensing facilities. Unattended self-service motor fuel-dispensing facilities shall comply with Sections 2304.3.1 through 2304.3.7.

2304.3.1 General. Where approved, unattended self-service motor fuel-dispensing facilities are allowed. As a condition of approval, the owner or operator shall provide, and be accountable for, daily site visits, regular equipment inspection and maintenance.
2304.3.2 Dispensers.
Dispensing devices shall comply with Section 2306.7. Dispensing devices operated by the insertion of coins or currency shall not be used unless approved.

2304.3.3 Emergency controls.
Approved emergency controls shall be provided in accordance with Section 2303.2. Emergency controls shall be of a type which is only manually resettable.
2304.3.4 Operating instructions. Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser and shall indicate the location of the emergency controls required by Section 2304.3.3.

2304.3.5 Emergency procedures. An approved emergency procedures sign, in addition to the signs required by Section 2305.6, shall be posted in a conspicuous location and shall read:
IN CASE OF FIRE, SPILL OR RELEASE

1. USE EMERGENCY PUMP SHUTOFF

2. REPORT THE ACCIDENT!

FIRE DEPARTMENT TELEPHONE NO. ______

FACILITY ADDRESS ___________________
2304.3.7 Quantity limits.
Dispensing equipment used at unsupervised locations shall comply with one of the following:

1. Dispensing devices shall be programmed or set to limit uninterrupted fuel delivery to 25 gallons (95 L) and require a manual action to resume delivery.

2. The amount of fuel being dispensed shall be limited in quantity by a preprogrammed card as approved.
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**2304.4 Dispensing into portable containers.** The dispensing of flammable or combustible liquids into portable approved containers shall comply with Sections 2304.4.1 through 2304.4.3.

**2304.4.1 Approved containers required.** Class I, II and IIIA liquids shall not be dispensed into a portable container unless such container does not exceed a 6-gallon (23.7 L) capacity, is listed or of approved material and construction, and has a tight closure with a screwed or spring-loaded cover so designed that the contents can be dispensed without spilling. Liquids shall not be dispensed into portable or cargo tanks.
2304.4.2 Nozzle operation.
A hose nozzle valve used for dispensing Class I liquids into a portable container shall be in compliance with Section 2306.7.6 and be manually held open during the dispensing operation.

2304.4.3 Location of containers being filled.
Portable containers shall not be filled while located inside the trunk, passenger compartment or truck bed of a vehicle.
IFC Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages

2305.3 Spill control. Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other approved means.

2305.4 Sources of ignition. Smoking and open flames shall be prohibited in areas where fuel is dispensed. The engines of vehicles being fueled shall be shut off during fueling. Electrical equipment shall be in accordance with NFPA 70.
2305.5 Fire extinguishers. Approved portable fire extinguishers complying with Section 906 with a minimum rating of 2-A:20-B:C shall be provided and located such that an extinguisher is not more than 75 feet (23 860 mm) from pumps, dispensers or storage tank fill-pipe openings.
2305.6 Warning signs.
Warning signs shall be conspicuously posted within sight of each dispenser in the fuel-dispensing area and shall state the following:

1. No smoking.
2. Shut off motor.
3. Discharge your static electricity before fueling by touching a metal surface away from the nozzle.
4. To prevent static charge, do not reenter your vehicle while gasoline is pumping.
5. If a fire starts, do not remove nozzle—back away immediately.
6. It is unlawful and dangerous to dispense gasoline into unapproved containers.
7. No filling of portable containers in or on a motor vehicle. Place container on ground before filling.
2306.7.5 Dispenser hose. Dispenser hoses shall be a maximum of 18 feet (5486 mm) in length unless otherwise approved. Dispenser hoses shall be listed and approved. When not in use, hoses shall be reeled, racked or otherwise protected from damage.
2306.7.5.1 Emergency breakaway devices. Dispenser hoses for Class I and II liquids shall be equipped with a listed emergency breakaway device designed to retain liquid on both sides of a breakaway point. Such devices shall be installed and maintained in accordance with the manufacturer’s instructions. Where hoses are attached to hose-retrieving mechanisms, the emergency breakaway device shall be located between the hose nozzle and the point of attachment of the hose-retrieval mechanism to the hose.
2306.7.6 Fuel delivery nozzles. A listed automatic-closing-type hose nozzle valve with or without a latch-open device shall be provided on island-type dispensers used for dispensing Class I, II or III liquids.

Overhead-type dispensing units shall be provided with a listed automatic-closing-type hose nozzle valve without a latch-open device.

Exception: A listed automatic-closing-type hose nozzle valve with latch-open device is allowed to be used on overhead-type dispensing units where the design of the system is such that the hose nozzle valve will close automatically in the event the valve is released from a fill opening or upon impact with a driveway.
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- Alternative Fuels
  - 2306.8 Alcohol-blended fuel-dispensing operations.
  - 2307 LIQUEFIED PETROLEUM GAS MOTOR FUEL-DISPENSING FACILITIES
  - 2308 COMPRESSED NATURAL GAS MOTOR FUEL-DISPENSING FACILITIES
  - 2309 HYDROGEN MOTOR FUEL-DISPENSING AND GENERATION FACILITIES
  - 2310 MARINE MOTOR FUEL-DISPENSING FACILITIES
2311.1 General.
Repair garages shall comply with this section and the International Building Code. Repair garages for vehicles that use more than one type of fuel shall comply with the applicable provisions of this section for each type of fuel used.

Where a repair garage also includes a motor fuel-dispensing facility, the fuel-dispensing operation shall comply with the requirements of this chapter for motor fuel-dispensing facilities.
2311.2 Storage and use of flammable and combustible liquids.
The storage and use of flammable and combustible liquids in repair garages shall comply with Chapter 57 and Sections 2311.2.1 through 2311.2.4.

2311.2.1 Cleaning of parts.
Cleaning of parts shall be conducted in listed and approved parts-cleaning machines in accordance with Chapter 57.
2311.2.2 Waste oil, motor oil and other Class III B liquids.
Waste oil, motor oil and other Class III B liquids shall be stored in approved tanks or containers, which are allowed to be stored and dispensed from inside repair garages.
2311.2.3 Drainage and disposal of liquids and oil-soaked waste.
Garage floor drains, where provided, shall drain to approved oil separators or traps discharging to a sewer in accordance with the International Plumbing Code. Contents of oil separators, traps and floor drainage systems shall be collected at sufficiently frequent intervals and removed from the premises to prevent oil from being carried into the sewers.
2311.2.4 Spray finishing. Spray finishing with flammable or combustible liquids shall comply with Chapter 24.

2311.3 Sources of ignition. Sources of ignition shall not be located within 18 inches (457 mm) of the floor and shall comply with Chapters 3 and 35.
2311.3.1 Equipment.
Appliances and equipment installed in a repair garage shall comply with the provisions of the International Building Code, the International Mechanical Code and NFPA 70.

2311.3.2 Smoking.
Smoking shall not be allowed in repair garages except in approved locations.
IFC Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages

2311.4 Below-grade areas.
Pits and below-grade work areas in repair garages shall comply with Sections 2311.4.1 through 2311.4.3.

2311.4.1 Construction.
Pits and below-grade work areas shall be constructed in accordance with the International Building Code.
2311.4.2 Means of egress.
Pits and below-grade work areas shall be provided with means of egress in accordance with Chapter 10.

2311.4.3 Ventilation.
Where Class I liquids or LP-gas are stored or used within a building having a basement or pit wherein flammable vapors could accumulate, the basement or pit shall be provided with mechanical ventilation in accordance with the International Mechanical Code, at a minimum rate of 1 1/2 cubic feet per minute per square foot (cfm/ft²) [0.008 m³/(s • m²)] to prevent the accumulation of flammable vapors.
2311.5 Preparation of vehicles for repair.
For vehicles powered by gaseous fuels, the fuel shutoff valves shall be closed prior to repairing any portion of the vehicle fuel system.

Vehicles powered by gaseous fuels in which the fuel system has been damaged shall be inspected and evaluated for fuel system integrity prior to being brought into the repair garage. The inspection shall include testing of the entire fuel delivery system for leakage.
IFC Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages

- **2311.6 Fire extinguishers.**
  Fire extinguishers shall be provided in accordance with Section 906.
2311.7 Repair garages for vehicles fueled by lighter-than-air fuels.
Repair garages for the conversion and repair of vehicles which use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels shall be in accordance with Sections 2311.7 through 2311.7.2.3 in addition to the other requirements of Section 2311.

Exception: Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance requiring no open flame or welding.
2311.7.1 Ventilation.
Repair garages used for the repair of natural gas- or hydrogen-fueled vehicles shall be provided with an approved mechanical ventilation system. The mechanical ventilation system shall be in accordance with the International Mechanical Code and Sections 2311.7.1.1 and 2311.7.1.2.

Exception: Repair garages with natural ventilation when approved.
2311.7.1.1 Design.
Indoor locations shall be ventilated utilizing air supply inlets and exhaust outlets arranged to provide uniform air movement to the extent practical. Inlets shall be uniformly arranged on exterior walls near floor level. Outlets shall be located at the high point of the room in exterior walls or the roof.

Ventilation shall be by a continuous mechanical ventilation system or by a mechanical ventilation system activated by a continuously monitoring natural gas detection system or, for hydrogen, a continuously monitoring flammable gas detection system, each activating at a gas concentration of not more than 25 percent of the lower flammable limit (LFL). In all cases, the system shall shut down the fueling system in the event of failure of the ventilation system.

The ventilation rate shall be at least 1 cubic foot per minute per 12 cubic feet \[0.00139 \text{ m}^3 \times (\text{s} \cdot \text{m}^3)\] of room volume.
2311.7.1.2 Operation. The mechanical ventilation system shall operate continuously.

Exceptions:
- 1. Mechanical ventilation systems that are interlocked with a gas detection system designed in accordance with Sections 2311.7.2 through 2311.7.2.3.
- 2. Mechanical ventilation systems in repair garages that are used only for repair of vehicles fueled by liquid fuels or odorized gases, such as CNG, where the ventilation system is electrically interlocked with the lighting circuit.
IFC Chapter 23 – Motor Fuel-Dispensing Facilities and Repair Garages

2311.7.2 Gas detection system.
Repair garages used for repair of vehicles fueled by nonodorized gases, such as hydrogen and nonodorized LNG, shall be provided with a flammable gas detection system.

- Operates at 25% of the LFL
- Included in pits if LPG repair garage
2311.7.2.2 Operation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visual alarm signals in the repair garage.

2. Deactivation of all heating systems located in the repair garage.

3. Activation of the mechanical ventilation system, when the system is interlocked with gas detection.
2311.8.1 Methods of discharge. The discharge of hydrogen from motor vehicle fuel storage tanks shall be accomplished through a closed transfer system in accordance with Section 2311.8.1.1 or an approved method of atmospheric venting in accordance with Section 2311.8.1.2.
Questions?
South Carolina Hydrogen Permitting Act
Chapter 9, Title 23, Article 5

The South Carolina Hydrogen Permitting Program within the Office of the State Fire Marshal. The purposes of this program are to:

1. make hydrogen fuel easily accessible to the general public for retail purchase from multiple, convenient locations throughout the State in a manner similar to that used for dispensing gasoline and other fuels sold to power motor vehicles;
2. promote and protect public health, safety, and welfare;
3. promote a positive business environment for the hydrogen and fuel cell industry; and
South Carolina Hydrogen Permitting Act

- Chapter 9, Title 23, Article 5

- The South Carolina Hydrogen Permitting Program within the Office of the State Fire Marshal. The purposes of this program are to:
  - 4. demonstrate leadership as a progressive alternative energy state by ensuring that hydrogen and fuel cells are permitted on a consistent basis throughout the State and meet minimum standards of quality provided in the International Code Council's 2006 codes or the latest state-adopted version.
Section 23-9-530. As used in this article:

1. 'Container' means all vessels including, but not limited to, tanks, cylinders, or pressure vessels used for storage of hydrogen.

2. 'Facility' means a fueling station or a fuel cell site that will store or dispense hydrogen for use as a transportation fuel and motor vehicle fuel or in a fuel cell.
Section 23-9-530. As used in this article:

(3) 'Fuel cell' means an appliance that uses fuel to produce electricity through an electro-chemical process. These fuels include, but are not limited to, hydrogen, methanol, or solid oxides.

(4) 'Fueling station' means a facility that dispenses gasoline, hydrogen, or other fuels intended to be used in motor vehicles.
Section 23-9-530. As used in this article:

(5) 'Hydrogen facility' or 'facility' means a fueling station or a fuel cell site that will store or dispense hydrogen for use as a transportation fuel and motor vehicle fuel or in a fuel cell.
Section 23-9-540. Only the State Fire Marshal may:

(1) permit a hydrogen facility in this State, although he may delegate this permitting authority to a county or municipal official if the:

- (a) county or municipality served by the official has at least three hydrogen fueling stations to be renovated or constructed in its jurisdiction; and
- (b) official completes prescribed training and obtains certification pursuant to Section 23-9-550(3).
Section 23-9-540. Only the State Fire Marshal may:

(2) impose a fee related to the permitting, licensing, or inspection of a hydrogen fueling station under this article, in addition to the application filing fee provided in Section 23-9-560(B)(1). The State Fire Marshal may not delegate this authority to impose a fee.
Section 23-9-550. (A) The State Fire Marshal shall:

1. ensure that the laws of this State governing gaseous and liquefied hydrogen at a hydrogen facility are executed faithfully;

2. require conformance with fire prevention and protection standards based on nationally recognized standards prescribed by law or regulation for the prevention of fire and the protection of life and property;
South Carolina Hydrogen Permitting Act

Section 23-9-550.  (A) The State Fire Marshal shall:

(3) develop training and certification requirements a county or municipal official must satisfy to grant a permit to a hydrogen facility through a delegation of the State Fire Marshal's authority under Section 23-9-540, subject to the limits in subsection (B) of this section;
Section 23-9-550. (A) The State Fire Marshal shall:

(4) develop minimum requirements for the design, construction, location, installation, and operation of equipment for storing, handling, and dispensing hydrogen at a facility. These requirements must:

(a) reasonably be necessary to protect the health, welfare, and safety of the public and a person using these materials; and

(b) substantially conform to the generally accepted standards of safety concerning hydrogen;
South Carolina Hydrogen Permitting Act

Section 23-9-550. (A) The State Fire Marshal shall:

- (5) impose at least semi-annual random inspections of a facility licensed under this article to determine the hydrogen's value for fueling and the facility's safety; and

- (6) promulgate regulations necessary to carry out the requirements of this article.
Section 23-9-550.

(B) When a codes and standards organization certified by the American National Standards Institute develops a standard procedure for training and certifying a county or municipal official to permit to a hydrogen facility, the State Fire Marshal may adopt this procedure.
Section 23-9-560. (A) A party seeking to renovate or construct a facility to store or dispense hydrogen must apply to the State Fire Marshal or his certified designee by registered mail, return receipt requested, for approval before beginning the renovation construction. An application must include:

› (1) a site plan;
› (2) an accidental release plan;
› (3) piping layout with valves and fitting details;
› (4) normal and emergency ventilation designs;
› (5) tank capacity and design standards;
› (6) electrical plan; tank and piping support details;
Section 23-9-560. (A) A party seeking to renovate or construct a facility to store or dispense hydrogen must apply to the State Fire Marshal or his certified designee by registered mail, return receipt requested, for approval before beginning the renovation construction. An application must include:

- (7) information concerning on-site fire protection equipment;
- (8) information concerning tank location with respect to other tanks and dikes; and
- (9) other information the State Fire Marshal considers relevant for evaluating the application.
Section 23-9-560.  (B) The State Fire Marshal:

1. may charge an application filing fee of ten dollars that must be paid before an application may be accepted;

2. may conduct a hearing on an application; and

3. shall approve or deny an application within sixty calendar days or the application automatically is considered approved.
Section 23-9-570.

(A) A person who conveys or offers to convey hydrogen in violation of this article may be subject to an administrative fine, stop-sale order, or both, at the discretion of the State Fire Marshal.
Section 23-9-570.

(B) An administrative fine must not be assessed for an amount greater than one thousand dollars unless the violation:
   › (1) threatens public health or safety;
   › (2) is committed knowingly and intentionally; or
   › (3) reflects a continuing and repetitive pattern of disregard for the requirements of this article.

(C) An administrative fine may not exceed ten thousand dollars for a violation."
Questions?
Hazardous Materials and the IFC

Quarterly Fire Marshal Training
July 16, 2013
Course Code: 8506 - - -

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