Emergency Preparedness Implications: Changes to the Globally Harmonized System of Classification and Labeling of Chemicals

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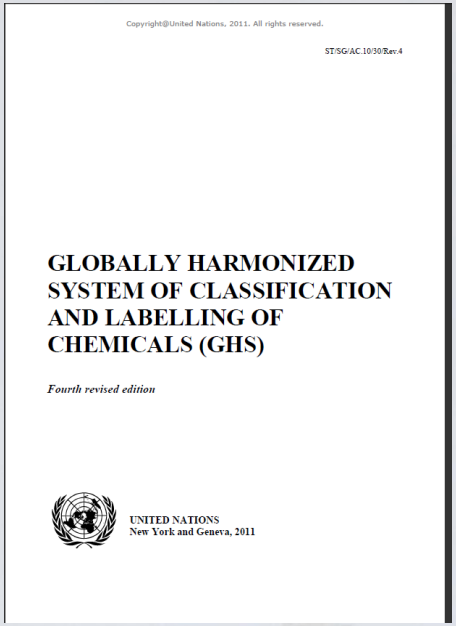
Revised Hazard Communication Standard
29 CFR 1910.1200

- First major technical revision in **29 years**.
- Reminder: HAZCOM-more than just OSHA. Includes:
  - Department of Transportation (DOT)
  - Consumer Product Safety Commission (consumer products)
  - Environmental Protection Agency (pesticides, Toxic substance control act TSCA)
- How did the revised standard come to be?
  - OSHA (request for Information) RFIs in 1990
    - 600 responses
    - Majority wanted standardized data sheets and labels
  - UN 1992-call for development of a GH chemical classification and labeling system by 2000. Final HCS rule based on Revision 3 (although Rev 4 is now out).



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- OSHA's view of the final rule
  - Modified the HCS to make it consistent with the GHS
  - Adopting the GHS will result in clearer, more effective methodology for conveying information on hazardous chemicals to employers and employees.
  - Valuable systematic approach for employers to evaluate workplace hazards and provide employees with consistent information regarding hazards.
- United Steel Workers representative: ''the HCS in 1983 gave the workers the 'right to know' but the GHS will give the workers the 'right to understand' ''*

*Federal Register/Vol. 77, No 58/Monday, March 26, 2012(Document ID #0403).

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Major high level changes to the Hazard Communication Standard:

- **Hazard classification:** Chemical manufacturers and importers are required to determine the hazards of the chemicals they produce or import. Hazard classification under the new, updated standard provides specific criteria to address health and physical hazards as well as classification of chemical mixtures.
- **Labels:** Chemical manufacturers and importers must provide a label that includes a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category.

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Major high level changes to the Hazard Communication Standard (cont.):

- **Safety Data Sheets:** The new format requires 16 specific sections, ensuring consistency in presentation of important protection information.
- **Information and training:** To facilitate understanding of the new system, the new standard requires that workers be trained on the new label elements and safety data sheet format, in addition to the current training requirements.

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Changes from the Proposed Rule to the Final Rule:

- Maintaining the disclosure of exposure limits (Threshold Limit Values [TLVs]) established by the American Conference of Governmental Industrial Hygienists (ACGIH) and carcinogen status from nationally and internationally recognized lists of carcinogens on the safety data sheets;
- Clarification that the borders of pictograms must be red on the label;
- Flexibility regarding the required precautionary and hazard statements to allow label preparers to consolidate and/or eliminate inappropriate or redundant statements; and
- Longer deadlines for full implementation of the standard.

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What? When?

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Effective Completion Date	Requirement(s)	Who
12/01/2013	Train employees on the new label elements and SDS format.	Employers
06/01/2015 12/01/2015	Comply with all modified provisions of this final rule, except: Distributors may ship products labeled by manufacturers under the old system	Chemical manufacturers, importers, distributors and employers Chemical manufacturers, importers, distributors and employers
06/01/2016	Update alternative workplace labeling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.	Employers
Transition Period	Comply with either 29 CFR 1910.1200 (this final standard), or the current standard, or both.	Chemical manufacturers, importers, distributors and employers

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- **Other U.S. Agencies:** The Department of Transportation (DOT), Environmental Protection Agency (EPA), and the Consumer Product Safety Commission (CPSC) actively participated in developing the GHS. DOT has already modified its requirements for classification and labeling to make them consistent with United Nations transport requirements and the new globally harmonized system.
- **Global implementation:** The new system is being implemented throughout the world by countries including Canada, the European Union, China, Australia, and Japan.

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Other standards affected:

• 1910.120 (HAZWOP-ER) and 1910.119 (Process Safety Management): Incorporates the current HCS definitions of flammable liquid and gas

• 1910.252 (Welding) standard: Requirements on labeling welding consumables to be consistent with GHS modifications to HCS

•Amend paragraphs on flammable and combustible liquids to conform categories, terminology, flashpoints (FP), and boiling points to the GHS modifications to HCS

•1910.106 (Flammable/Combustible Liquids): Incorporate the modified-HCS definition of flammable aerosols into the Flammable and Combustible Liquids standard

•Update the acceptable methods for determining flashpoints

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SAMPLE LABEL

PRODUCT IDENTIFIER

CODE _____
Product Name _____

SUPPLIER IDENTIFICATION

Company Name_____
Street Address _____
City _____ State _____
Postal Code _____ Country _____
Emergency Phone Number _____

PRECAUTIONARY STATEMENTS

Keep container tightly closed. Store in cool, well ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measure against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear Protective gloves.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Dispoae of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon dioxide (CO_2) fire extinguisher to extinguish.

First Aid
If exposed call Poison Center.
If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water.

HAZARD PICTOGRAMS

SIGNAL WORD

Danger

HAZARD STATEMENT

Highly flammable liquid and vapor.
May cause liver and kidney damage.

SUPPLEMENTAL INFORMATION

Directions for use
_____
_____
_____

Fill weight: _____ Lot Number _____
Gross weight: _____ Fill Date: _____
Expiration Date: _____

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HCS Pictograms and Hazards

Health Hazard	Flame	Exclamation Mark
		
▪ Carcinogen ▪ Mutagenicity ▪ Reproductive Toxicity ▪ Respiratory Sensitizer ▪ Target Organ Toxicity ▪ Aspiration Toxicity	▪ Flammables ▪ Pyrophorics ▪ Self-Heating ▪ Emits Flammable Gas ▪ Self-Reactives ▪ Organic Peroxides	▪ Irritant (skin and eye) ▪ Skin Sensitizer ▪ Acute Toxicity ▪ Narcotic Effects ▪ Respiratory Tract Irritant ▪ Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder	**Corrosion**	**Exploding Bomb**
		
▪ Gases Under Pressure	▪ Skin Corrosion/Burns ▪ Eye Damage ▪ Corrosive to Metals	▪ Explosives ▪ Self-Reactives ▪ Organic Peroxides
Flame Over Circle	**Environment** (Non-Mandatory)	**Skull and Crossbones**
		
▪ Oxidizers	▪ Aquatic Toxicity	▪ Acute Toxicity (fatal or toxic)

SDS components

New SDSs provide items of primary interest to emergency responders at the beginning of the document, with more technical information in later sections.

- Identification
- Hazard(s) identification
- Composition/information on ingredients
- First aid measures
- Fire-fighting measures
- Accidental release measures
- Handling and storage
- Exposure controls/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Disposal considerations (non-mandatory)
- Transport information (non-mandatory)
- Regulatory information (non-mandatory)
- Other information.

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So, what does this mean to emergency responders?

- First responders
- HAZMAT teams
- Fire Departments

What do emergency responders need?

•Emergency responders need accurate, detailed and sufficiently clear to facilitate an immediate response*.

•Fire fighters need information that can be seen and understood at a distance, such as graphical and coded information.

•“It is not overreaching for us to say that lives will be saved through harmonization**”

MSDS ONLINE GHS 101

**Jefferson County Local Emergency Planning Committee” maintaining that critical information can be missed by first responders due to the current lack of consistency in presentation of information on SDSs.

How have emergency responders been involved?

•Emergency Response and Community Right-to-Know Act of 1986 (SARA) mandated that (M)SDSs be made available to state emergency response commissions, local emergency planning committees, and fire departments in order to assist in planning and response to emergencies.

•Emergency responders participated in the development of American National Standards Institute (ANSI) standard Z400.1, a voluntary consensus standard for the preparation of SDSs.

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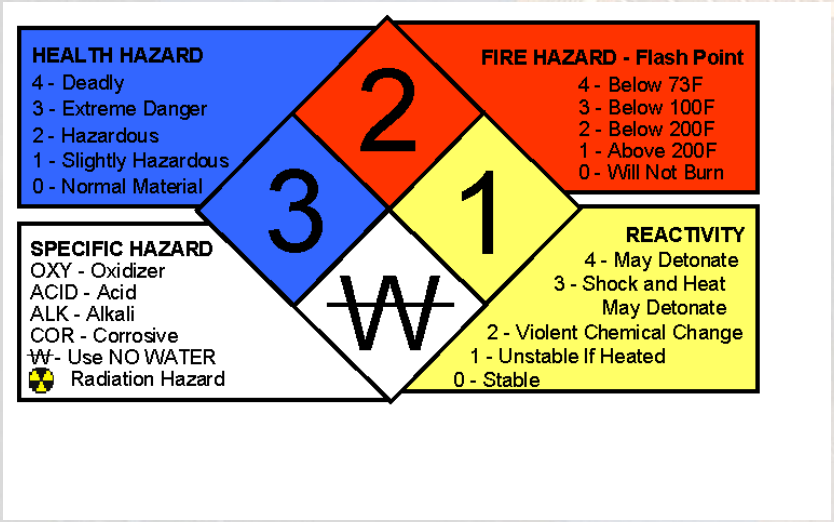
Issues:

- Cost and time for training. (OSHA: 8 hours for training on the revised HCS elements).
- Eliminating the term "combustible liquid" will likely cause some confusion since it is still used by NFPA and DOT.
- Clarification or additional guidance is needed on how secondary labeling systems such as NFPA's 704 Diamond or the Hazardous Materials Information System (HMIS) would be used once GHS was in effect.

Secondary Labeling Systems: NFPA



Health (Blue)	
0	Poses no health hazard, no precautions necessary (e.g., water)
1	Exposure would cause irritation with only minor residual injury (e.g., acetone)
2	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g., ethyl ether)
3	Short exposure could cause serious temporary or moderate residual injury (e.g., chlorine gas)
4	Very short exposure could cause death or major residual injury (e.g., hydrogen cyanide, phosphine, carbon monoxide, sarin)

Secondary Labeling Systems: HMIS

- **4.** Life-threatening, major or permanent damage may result from single or repeated overexposures (e.g., hydrogen cyanide).
- **3.** Major injury likely unless prompt action is taken and medical treatment is given.
- **2.** Temporary or minor injury may occur.
- **1.** Irritation or minor reversible injury possible.
- **0.** No significant risk to health.

OSHA/GHS

- A1: ACUTE TOXICITY
- A2: SKIN CORROSION/IRRITATION
- A3: SERIOUS EYE DAMAGE/EYE IRRITATION
- A4: RESPIRATORY OR SKIN SENSITIZATION
- A5: GERM CELL MUTAGENICITY
- A6: CARCINOGENICITY
- A7: REPRODUCTIVE TOXICITY
- A.8 SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE
- A.9 SPECIFIC TARGET ORGAN TOXICITY REPEATED OR PROLONGED EXPOSURE
- A.10 ASPIRATION HAZARD

OSHA/GHS, cont.

- B1: EXPLOSIVES
- B2: FLAMMABLE GASES
- B3: FLAMMABLE AEROSOLS
- B4: OXIDIZING GASES
- B5: GASES UNDER PRESSURE
- B6: FLAMMABLE LIQUIDS
- B7: FLAMMABLE SOLIDS
- B.8 SELF REACTIVE CHEMICALS
- B.9 PYROPHORIC LIQUIDS
- B.10 PYROPHORIC SOLIDS
- B.11 SELF-HEATING CHEMICALS
- B.12 CHEMICALS WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES
- B.13 OXIDIZING LIQUIDS
- B.14 OXIDIZING SOLIDS
- B.15 ORGANIC PEROXIDES
- B.16 CORROSIVE TO METALS

OSHA/GHS

Example: A1: Acute Toxicity

Table A.1.1: Acute toxicity hazard categories and acute toxicity estimate (ATE) values defining the respective categories

Exposure route	Category 1	Category 2	Category 3	Category 4
Oral (mg/kg bodyweight) *see: Note (a) Note (b)*	≤ 5	>5 and ≤ 50	>50 and ≤ 300	>300 and ≤ 2000
Dermal (mg/kg bodyweight) *see: Note (a) Note (b)*	≤ 5	>50 and ≤ 200	>200 and ≤ 1000	>1000 and ≤ 2000
Inhalation - Gases (ppmV) *see: Note (a) Note (b) Note (c)*	≤ 100	>100 and ≤ 500	>500 and ≤ 2500	>2500 and ≤ 20000
Inhalation - Vapors (mg/l) *see: Note (a) Note (b) Note (c) Note (d)*	≤ 0.5	>0.5 and ≤ 2.0	>2.0 and ≤ 10.0	>10.0 and ≤ 20.0
Inhalation – Dusts and Mists (mg/l) *see: Note (a) Note (b) Note (c)*	≤ 0.05	>0.05 and ≤ 0.5	>0.5 and ≤ 1.0	>1.0 and ≤ 5.0

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NFPA's issues

- GHS categories conflict with NFPA's established hazard ratings in NFPA 704, in effect since the 1950s.
- NFPA recommended that the term ''combustible liquid'' **not** be deleted.
- There may be additional confusion since the rating system in NFPA 704 expresses the most hazardous as a ''4'' while the GHS classification criteria Category ''1''.

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NFPA's issues, cont.

- Proposed realignment of the flammable liquid categories would result in confusion among employees, emergency responders, authorities having jurisdiction, and others who have been used to the distinction between flammable and combustible liquids
- Possible considerable confusion among the workers who have been instructed to take specific precautions for various liquids based on whether they were identified as flammable or combustible.

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- The International Fire Marshals Association (IFMA): users have been relying on the NFPA 704 Hazard Rating and the Hazardous Material Information System (HMIS) systems for a long time and would be confused by the change.

In the short term…

- HMIS expects to change numbering system to match GHS.
- Not clear what NFPA will do.

Recommendations

- Begin communications immediately with internal and external emergency management organizations, regarding the changes to the HCS, and how organizational members/responder will need to be trained. Address use or change of building placards with the NFPA diamond.
- Work with your chemical safety SMEs/program leads at your site to update training materials, written hazard communication programs, and emergency management programs.
- Investigate whether you have site employees that meet the definition of a chemical manufacturer, importer, or distributor.
- Consider participating in the EFCOG initiative on developing materials for training and hazard communication program.
- Start planning/updating **now** to meet the December 2013 deadline.

Questions?

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