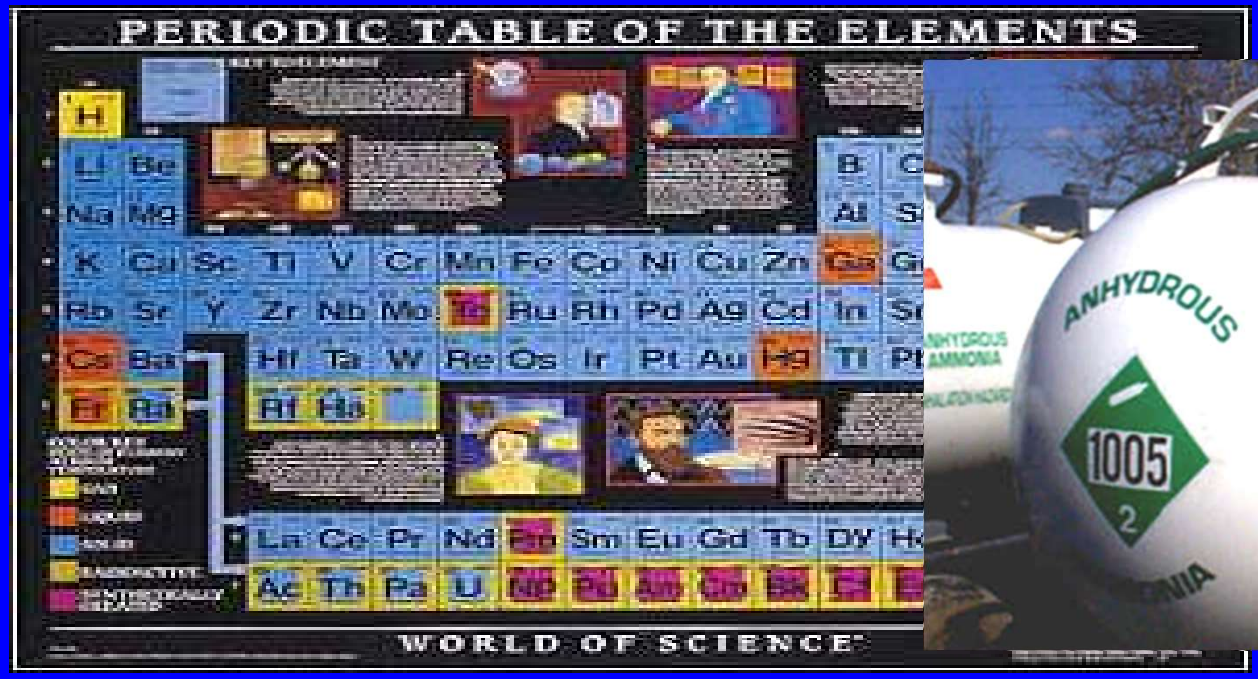
Hazardous Materials

Recognition and Identification of Hazards



UNITED STATES EPA EMERGENCY RESPONSE ENVIRONMENTAL PROTECTION AGENCY

Objectives

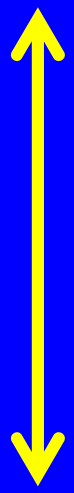
- Associate specific hazards with chemicals found in our communities.
- Understand the different system used to help communicate chemical identification and hazards

IDENTIFICATION of HAZARDOUS MATERIALS

Don't Forget
What was learned at the Awareness/Operational Levels!

(in order low risk to high)

Low Risk



High Risk

- Location
- Occupancy
- Container Size and Shape
- Placards and Markings
- Labels
- Senses/Direct Reading Instrumentation

EMERGENCY RESPONSE CONTINGENCY PLAN (ERCP)

- Lowest risk to responders
- Required by most government agencies
- “Pre-emergency plans” – former term used by fire departments

ERCP REQUIRED INFORMATION

- Facility layout
- Substance list
- Storage location
- Substance profile (MSDS)
- Special handling procedures

ERCP REQUIRED INFORMATION

- Emergency recognition/ prevention
- Personnel roles
- Lines of authority
- Communication

ERCP REQUIRED INFORMATION

- Transportation
- List of substances on board

ERCP REQUIRED INFORMATION

- Mitigation techniques
- Evacuation procedures

PIPELINES, FIXED FACILITY

- Various types bulk storage
- Pipeline systems, above or below ground
- Need ERCP
- Secondary containment system required

PIPELINES, FIXED FACILITY ABOVE AND BELOW GROUND

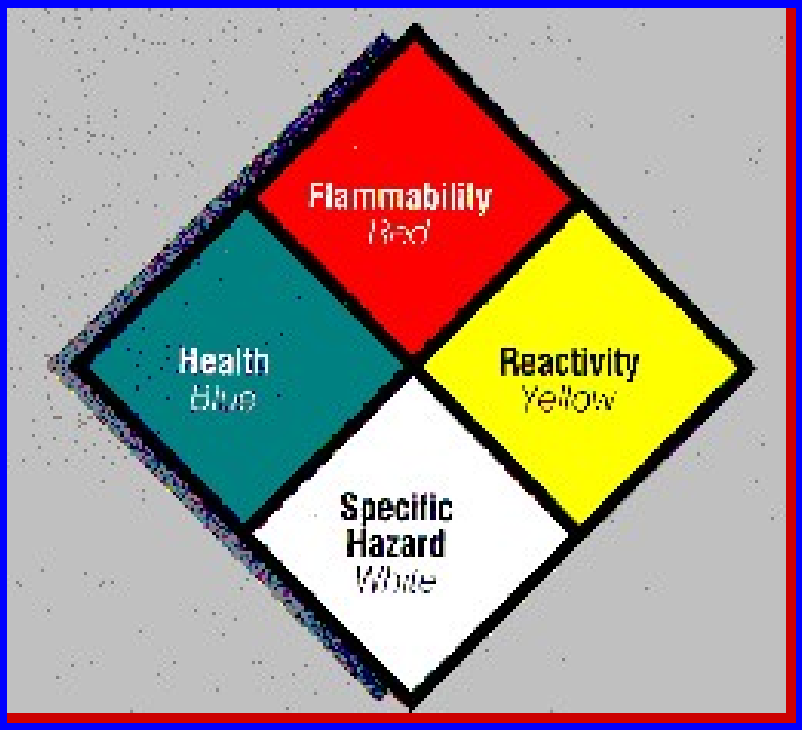
- Portable and fixed tanks
- Pipeline systems
- Fuel dispensing systems

MARKINGS AND COLORS

- Used as a means to recognize or identify chemicals

- Type of information:
  - **Product name(s)**
  - **Company name and phone number**
  - **Equipment license plate number**
  - **Hazard class and ID number**
  - **Signal words**

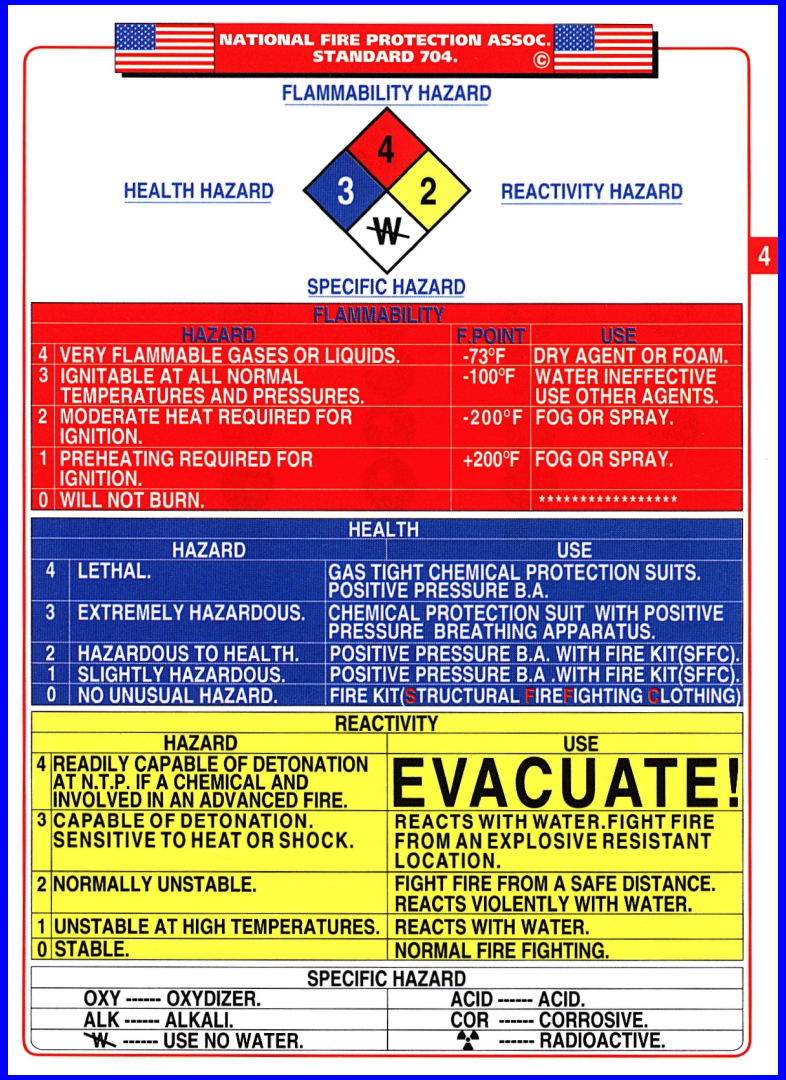
NFPA 704


Flammability
Red
Health
Blue
Reactivity
Yellow
Specific
Hazard
White

MARKINGS AND COLORS
FACILITY MARKINGS

- NFPA 704M system
- System label found on:
  - **Individual containers**
  - **Posted on rooms, buildings, fences**
  - **Not chemical-specific**
  - **Should not be on transport vehicles**

SYMBOL SEEKER NFPA 704M



NATIONAL FIRE PROTECTION ASSOC.
STANDARD 704. ©

FLAMMABILITY HAZARD

HEALTH HAZARD

REACTIVITY HAZARD

SPECIFIC HAZARD

4

FLAMMABILITY

	HAZARD	F.POINT	USE
4	VERY FLAMMABLE GASES OR LIQUIDS.	-73°F	DRY AGENT OR FOAM.
3	IGNITABLE AT ALL NORMAL TEMPERATURES AND PRESSURES.	-100°F	WATER INEFFECTIVE USE OTHER AGENTS.
2	MODERATE HEAT REQUIRED FOR IGNITION.	-200°F	FOG OR SPRAY.
1	PREHEATING REQUIRED FOR IGNITION.	+200°F	FOG OR SPRAY.
0	WILL NOT BURN.		**********

HEALTH

	HAZARD	USE
4	LETHAL.	GAS TIGHT CHEMICAL PROTECTION SUITS. POSITIVE PRESSURE B.A.
3	EXTREMELY HAZARDOUS.	CHEMICAL PROTECTION SUIT WITH POSITIVE PRESSURE BREATHING APPARATUS.
2	HAZARDOUS TO HEALTH.	POSITIVE PRESSURE B.A. WITH FIRE KIT(SFFC).
1	SLIGHTLY HAZARDOUS.	POSITIVE PRESSURE B.A .WITH FIRE KIT(SFFC).
0	NO UNUSUAL HAZARD.	FIRE KIT(STRUCTURAL FIREFIGHTING CLOTHING)

REACTIVITY

	HAZARD	USE
4	READILY CAPABLE OF DETONATION AT N.T.P. IF A CHEMICAL AND INVOLVED IN AN ADVANCED FIRE.	EVACUATE!
3	CAPABLE OF DETONATION. SENSITIVE TO HEAT OR SHOCK.	REACTS WITH WATER.FIGHT FIRE FROM AN EXPLOSIVE RESISTANT LOCATION.
2	NORMALLY UNSTABLE.	FIGHT FIRE FROM A SAFE DISTANCE. REACTS VIOLENTLY WITH WATER.
1	UNSTABLE AT HIGH TEMPERATURES.	REACTS WITH WATER.
0	STABLE.	NORMAL FIRE FIGHTING.

SPECIFIC HAZARD

OXY ------ OXYDIZER.	ACID ------ ACID.
ALK ------ ALKALI.	COR ------ CORROSIVE.
W ------ USE NO WATER.	☢ ------ RADIOACTIVE.

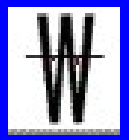
SPECIFIC HAZARD

= (oxidizer) Supports combustion

= pH less than 7, destroys tissue

= pH greater than 7, destroys tissue

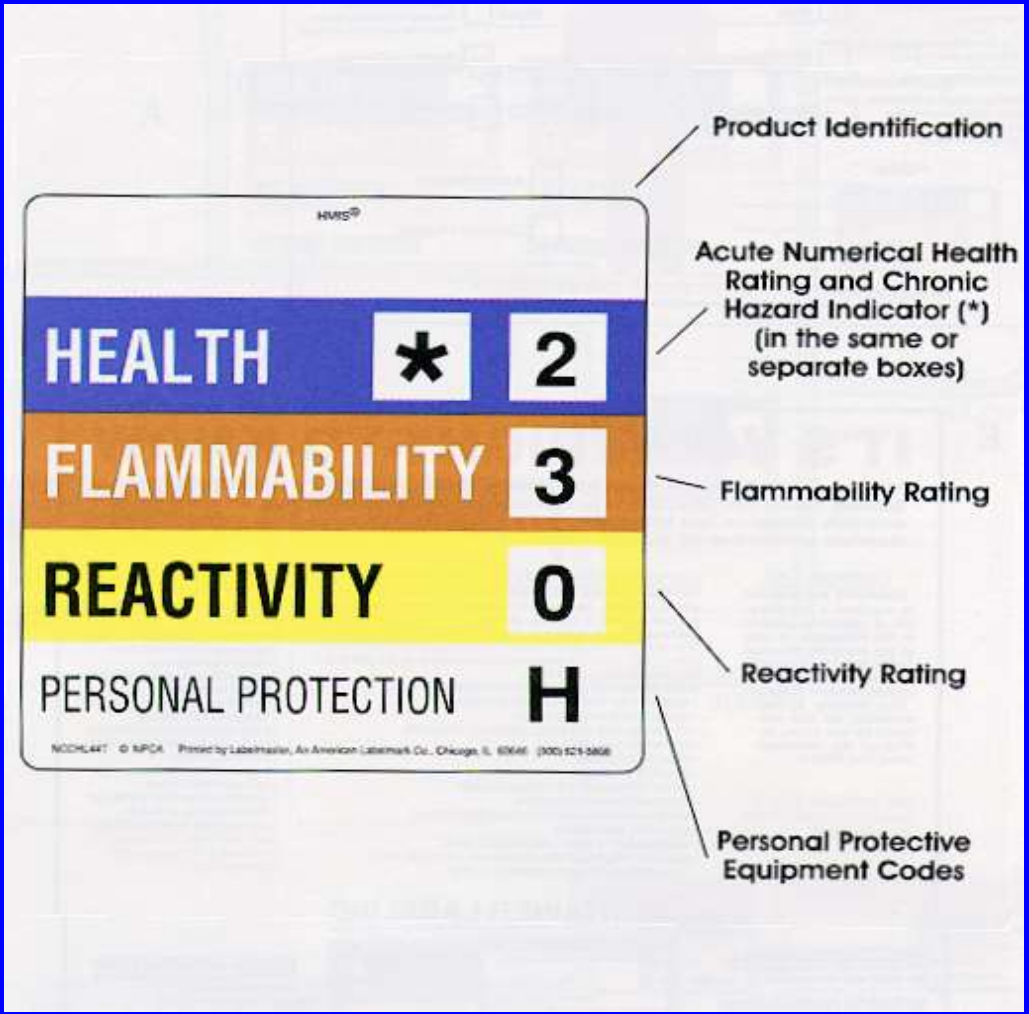
= Acid or Alkali, destroys tissue



= Water reactive


= Radioactive

HMIS Program

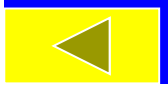


Protective Equipment

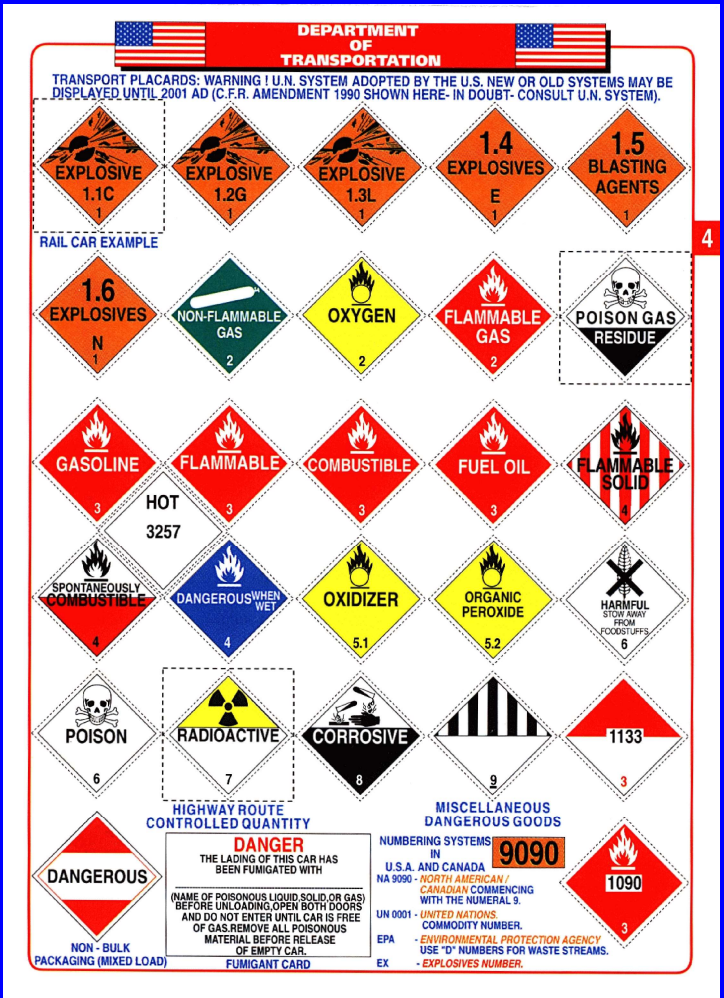
A		G	
B		H	
C		I	
D		J	
E		K	
F		X	Ask your supervisor for special handling instructions

DOT Hazard Class

- Class 1 Explosives
  - *6 Divisions*
- Class 2 Gasses
  - *3 Divisions*
- Class 3 Flammable Liquids
- Class 4 Flammable Solids
  - *3 Divisions*
- Class 5 Oxidizers
  - *2 Divisions*
- Class 6 Toxics
  - *2 Divisions*
- Class 7 Radioactive Material
- Class 8 Corrosives
- Class 9 Miscellaneous

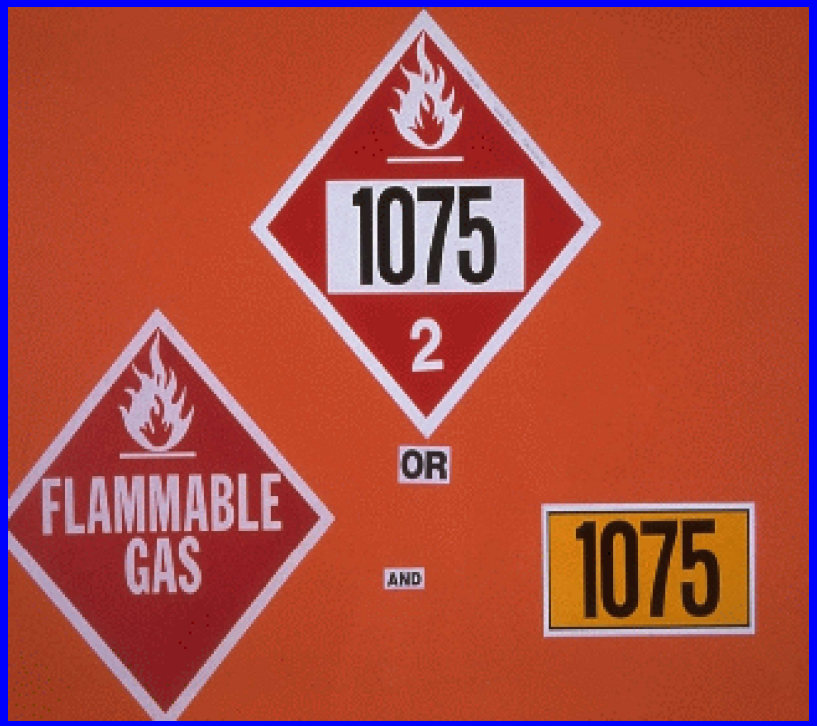


SYMBOL SEEKER PLACARDING



- DOT 49CFR, 172.502, .504, .605
- HM-181 - international standard
- Both ends and sides
- Table 1 – any amount
- Table 2 – 1001 lb or more

PLACARDING FIVE IDENTIFIERS



- Color
- Symbol at top
- Hazard Class number at bottom
- Name in center, English and other languages
- Four-digit UN/NA Chemical ID number

PLACARDING

- Two or more hazard classes, total gross weight of 1,001 lb or more
  - **Use "Dangerous" placard**
- Total gross weight of 2,205 lb. or more of one hazard class loaded at one facility
  - **Use that placard**

MARKING AND COLORS LABELING SYSTEM B POISONS

- EPA Registration Number
- Chemical
- Manufacturer

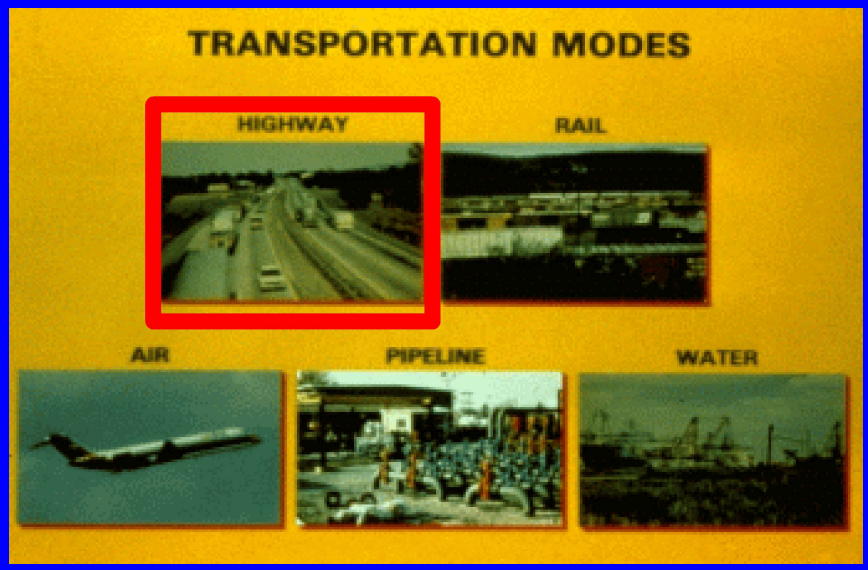
MARKING AND COLORS
LABELING SYSTEM B POISONS

3 SIGNAL WORDS

TOXICITY	SIGNAL WORD
High	Danger  Poison
Moderate	Warning
Low	Caution

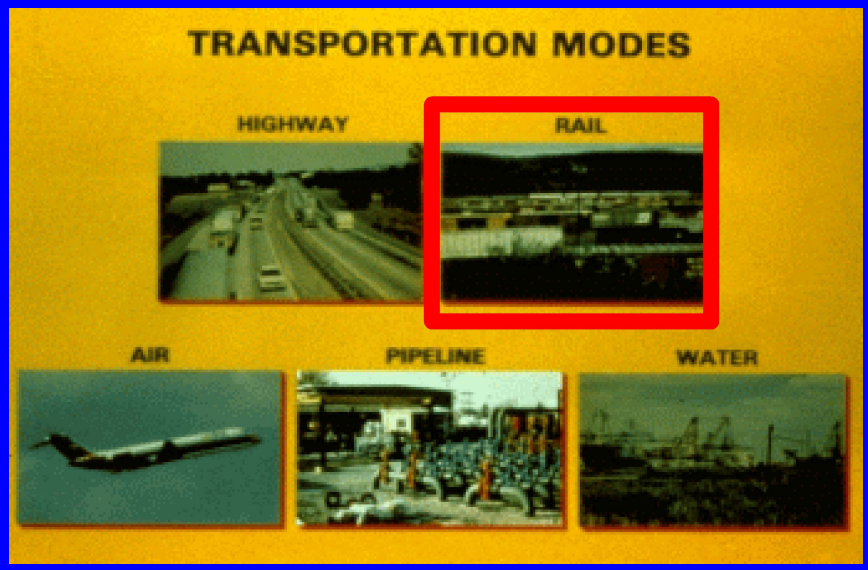
SHIPPING PAPERS HIGHWAY

- Bill of lading
  Within driver's reach
  in cab
  On seat or door, when
  not in cab
  Must comply with
  49 CFR 178



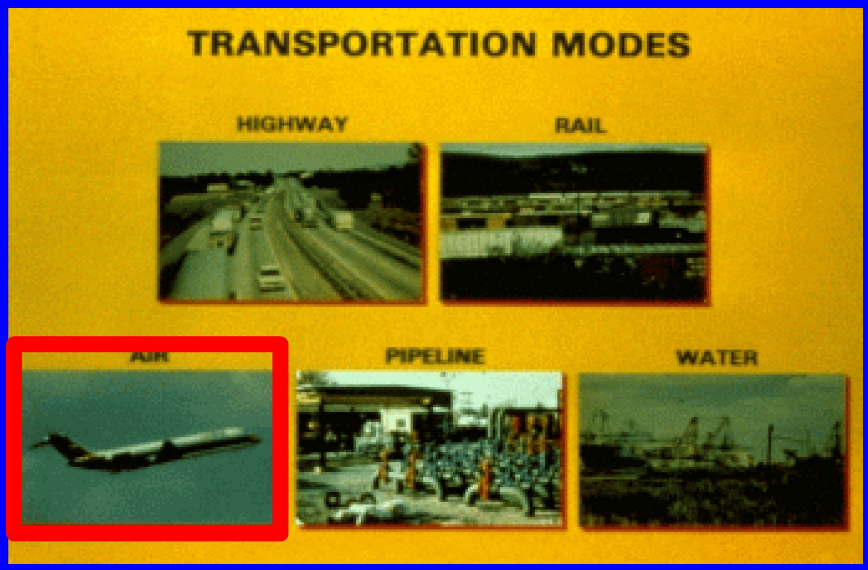
SHIPPING PAPERS RAILROAD

- Consist/wheel report
  Train crew, lead locomotive
  From the locomotive to deadman
  Must comply with 49 CFR 178



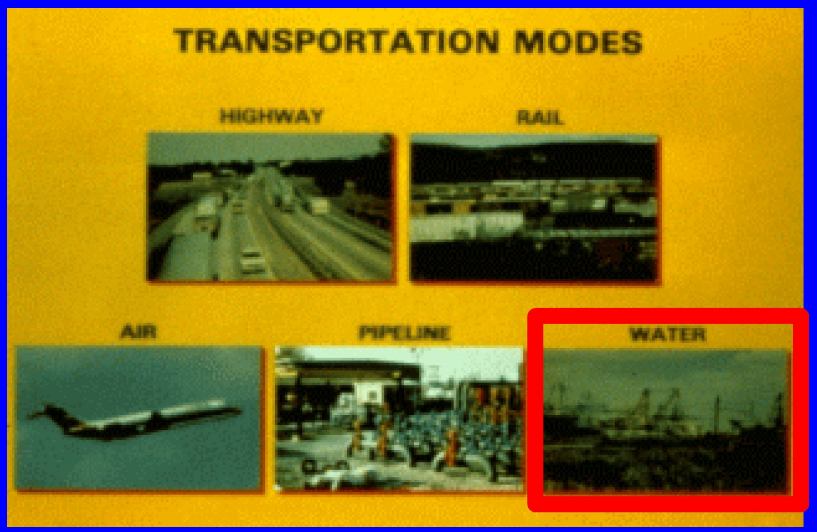
SHIPPING PAPERS AIRLINE

- Air bill
- Pilot must approve
- Pilot/cockpit
- Must comply with ICAO



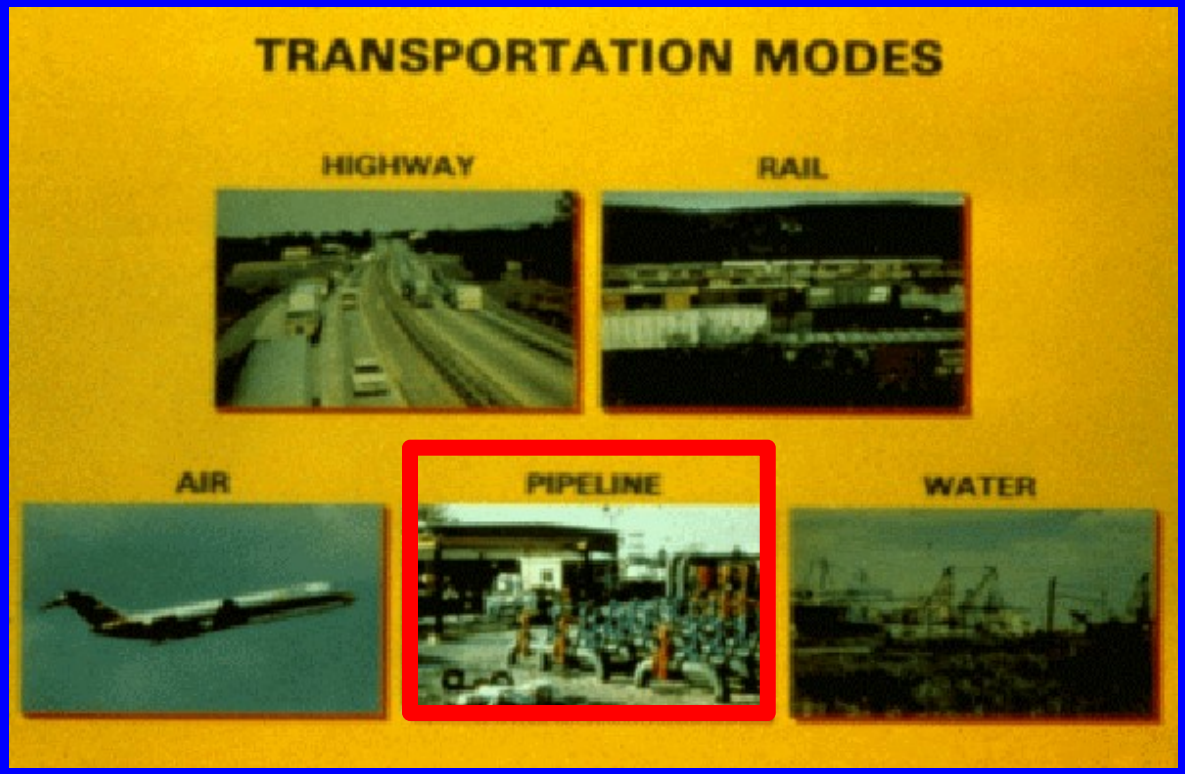
SHIPPING PAPERS WATERWAY

- Dangerous cargo
  Captain/master
  Wheelhouse or bridge, or
  mailbox on barge/tow
  Must comply with IMO



SHIPPING PAPERS PIPELINE

- Information on pipeline markers to call



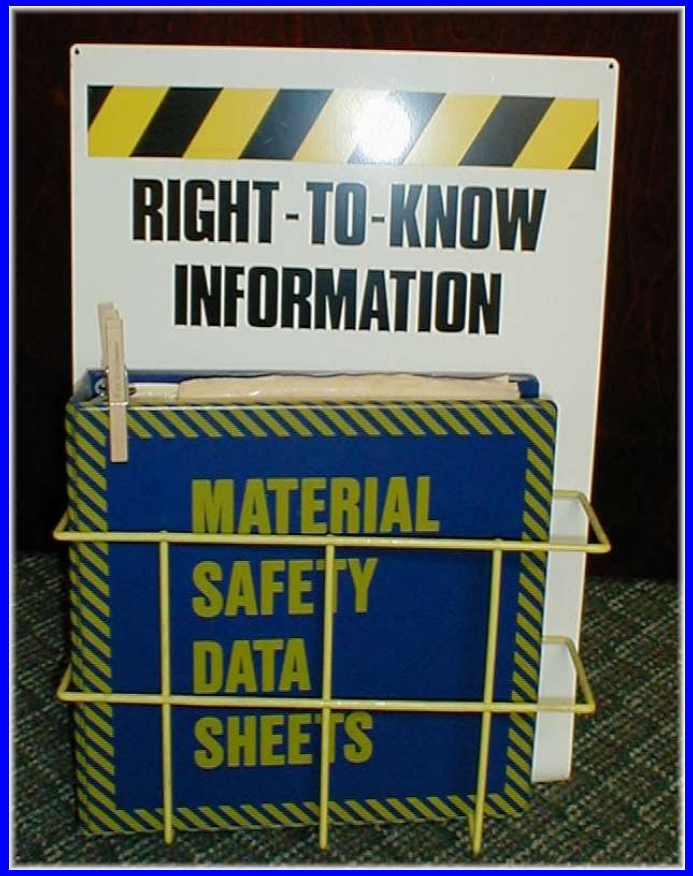
SENSES

- Use of senses is very risky in the identification of hazardous materials
- Desensitization of olfactory system could cause exposure to deadly concentrations
- Only safe sense is sight from a distance, with binoculars

SENSES

- Look for any biological indicators (dead animals or vegetation)
- Look for unusual colored smoke emitted from the scene
- Noises from containers are not normal (containers venting)
- Bulging containers, or those with deep gouges and dents, will rupture

Hazard Communications (HazCom)



CONCLUSION

- Six clues to identify presence of hazardous materials
- Use safest method available to ensure worker safety
- Each incident is different! Though material may be the same, don't be complacent
- Safest approach: UPwind, UPhill, Upstream
- Educated decisions can be made to safely mitigate a situation
- Rely on a variety of clues to collect information

Questions?

Photo by Vincent Laforet / The New York Times