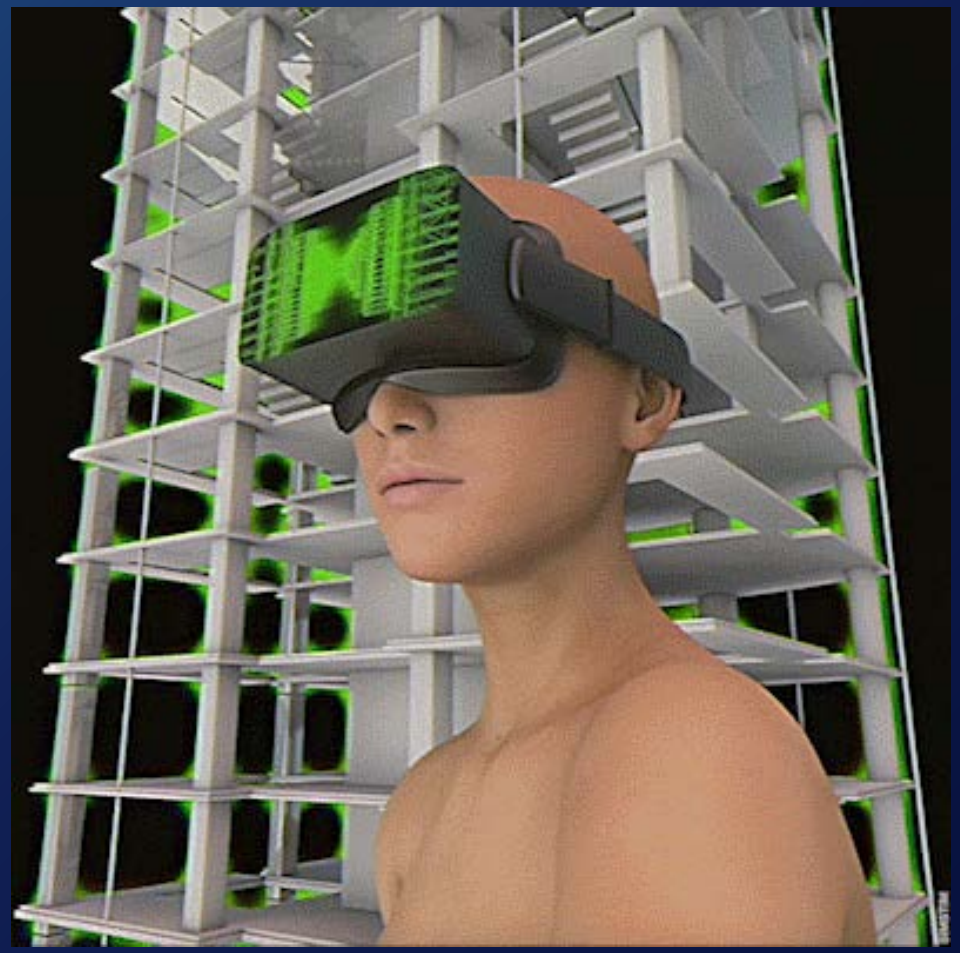
Haz Mat Fire Code Provisions V
This Time it's Virtual (Again)
March 31, 2022

Grant Miner, HazTAC Inc
Janice Van Mullem, Huntington Beach Fire Department

24th California Unified Program Annual Training Conference
March 22, 23, 24, 29, 30, 31 - 2022

Now Virtual Reality Enhanced!



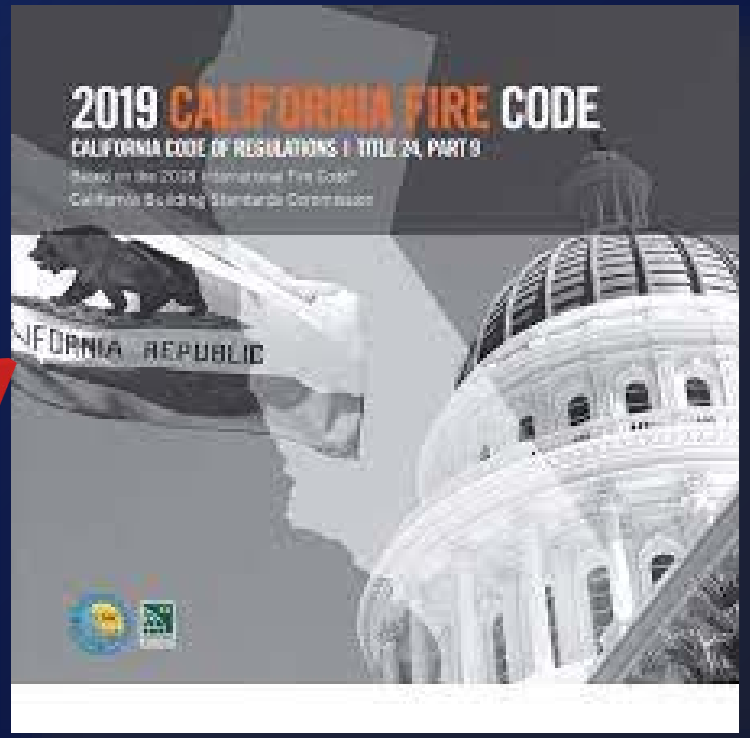
Objectives

- Evolution of Fire Code and HazMat regulations
- CFC Chapter 50 and MAQ's
- Pre-incident Planning
- Examination of recent and historic incidents

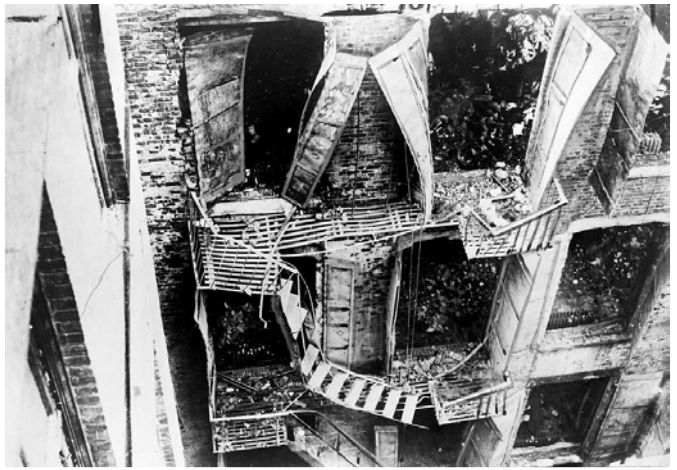
A Series of Unfortunate Events

As a rule I don't like suffering to no purpose. Suffering should be creative, should give birth to something good and lovely.

CHINUA ACHEBE



- Iroquois Theater Fire
- Triangle Shirtwaist Factory Fire



- Bhopal Disaster
- Fricker Fire

One Year After, Fricker Fire Leaves Legacy of Ordinances

June 22, 1986 | ROXANA KOPETMAN | Times Staff Writer

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Shelley J. Odom doesn't have garage sales often. Matter of fact, this weekend's sale outside her Anaheim home is the first since the one she had exactly one year ago. But that sale was interrupted.

The smell was too strong to take. The air was "too thick," she said. And her arms were itching. Every part of her body that was exposed began to itch. The garage sale was off.

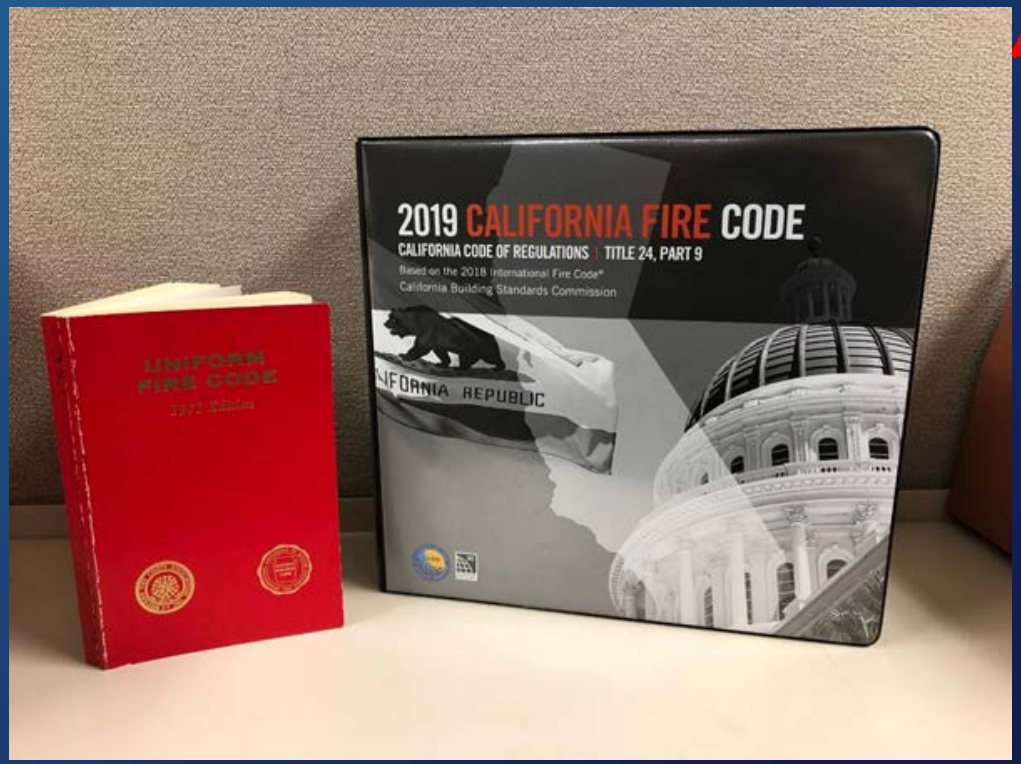
Nearby, firefighters were battling what soon became known as Orange County's worst hazardous materials accident.

WISER

Wireless Information System for Emergency Responders

Code Evolution

In the 80's the Uniform Fire Code began **classifying hazardous materials** and setting **limits for quantities**.

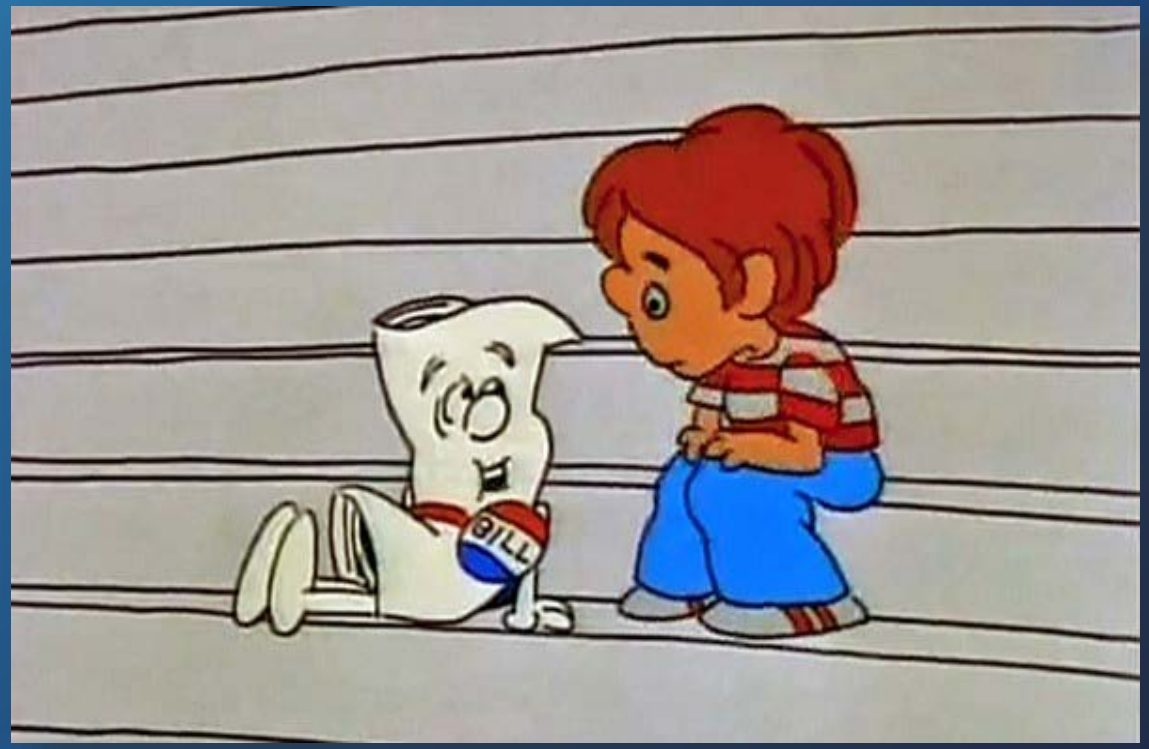


We're so much more sophisticated and comprehensive.

Code development is **continual** and **reactive**.

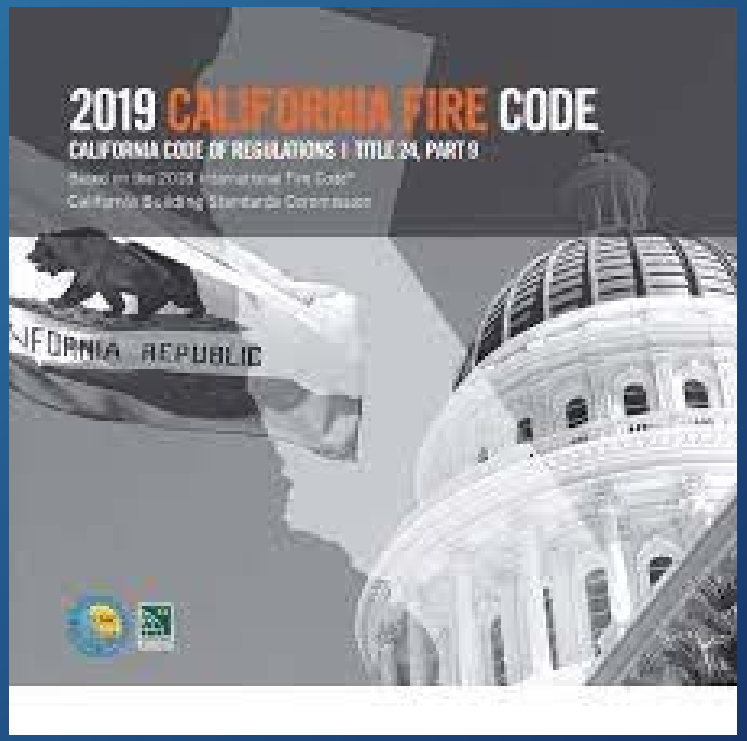
https://codes.iccsafe.org/content/CFC2019P1

How the CFC was created



- Model code (developed by ICC) is adopted by the State Fire Marshal's office
- Individual jurisdictions may amend these state codes
- Therefore, the specifics of a given code section or its interpretation may vary from jurisdiction to jurisdiction

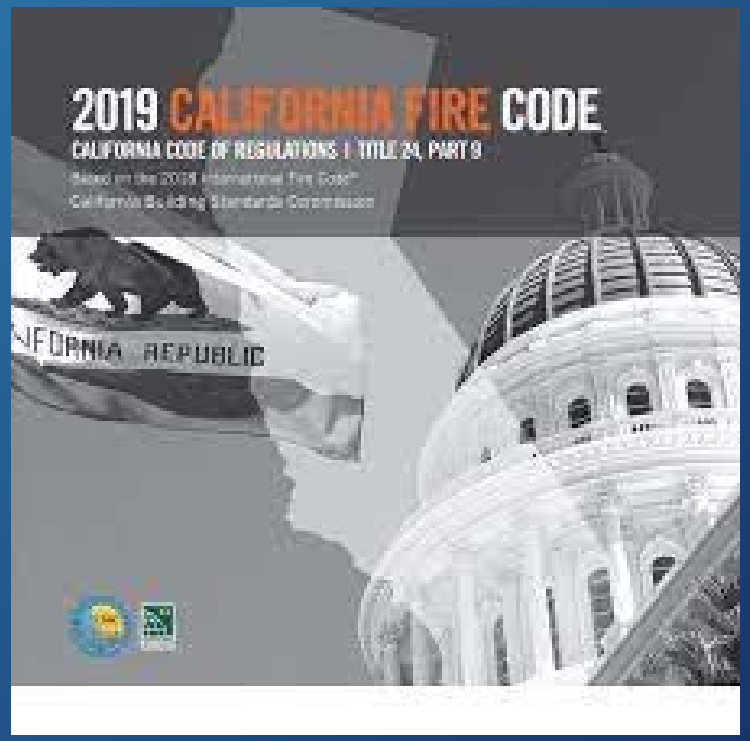
California Fire Code



Hazmat

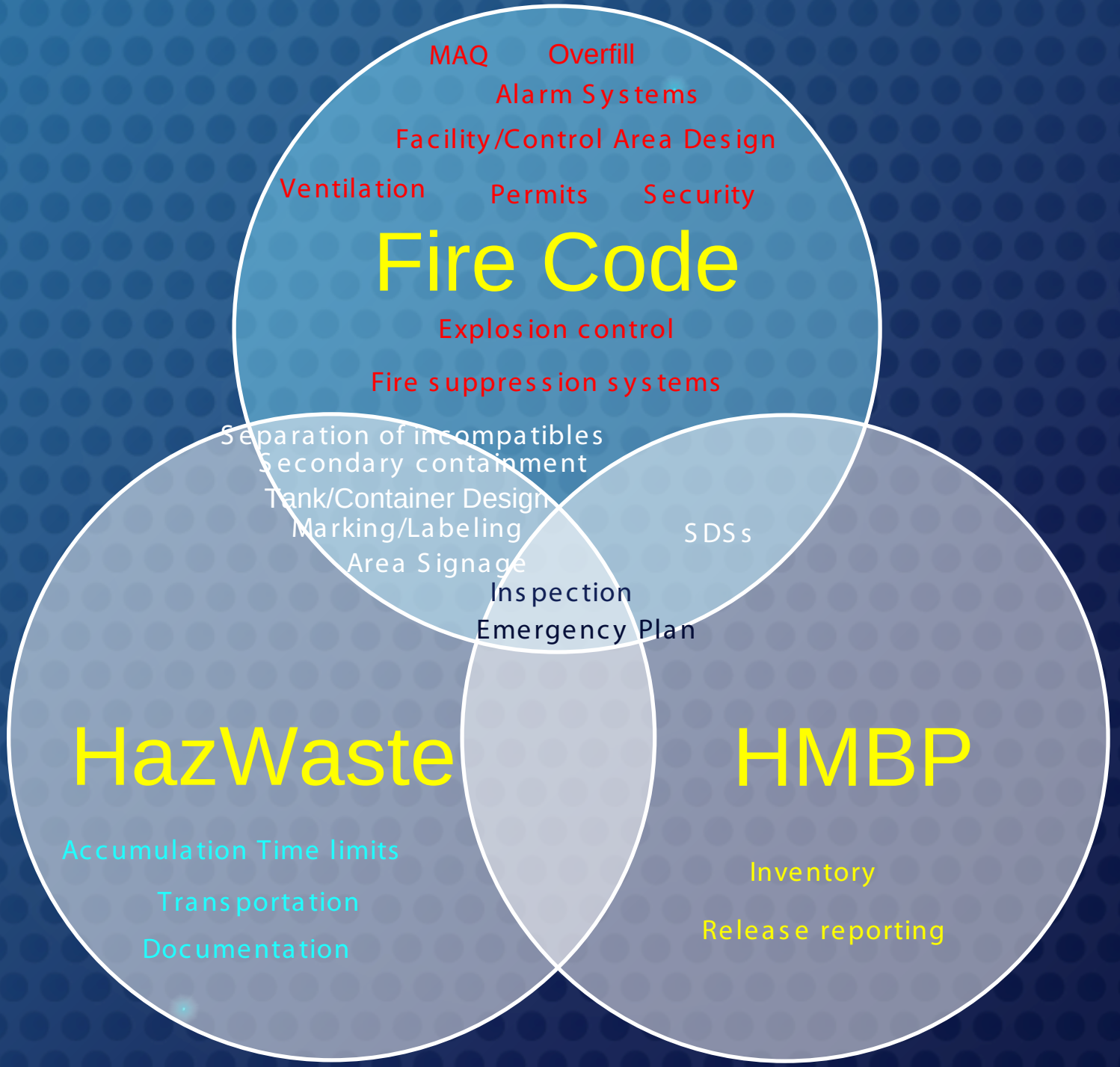
- 407 Hazard Communication
- 2104 Dry Cleaning
- 2306 Flammable/Combustible Liquid Motor Fueling
- 2307 Liquid Propane Gas Motor Fueling
- 2308 Compressed Natural Gas Motor Fueling
- 2309 Hydrogen Gas Motor Fueling
- 2404 Spray Finishing
- 2503 Ethylene Gas (fruit ripening)
- 2705 Use and Handling of HazMat in Semiconductor Fabrication
- Chapter 50 Hazardous Materials
- Chapter 53 Compressed Gases
- Chapter 54 Corrosive Materials
- Chapter 55 Cryogenic Fluids

California Fire Code



Hazmat

- Chapter 56 Explosives and Fireworks
- Chapter 57 Flammable and Combustible Liquids
- Chapter 58 Flammable Gases and Flammable Cryogenic Fluids
- Chapter 59 Flammable Solids
- Chapter 60 Highly Toxic and Toxic Materials
- Chapter 61 Liquefied Propane Gases
- Chapter 62 Organic Peroxide
- Chapter 63 Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids
- Chapter 64 Pyrophoric Materials
- Chapter 66 Unstable (Reactive) Materials
- Chapter 67 Water-Reactive Solids and Liquids
- Appendix E Hazard Categories
- Appendix H Hazardous Materials Management Plans and Hazardous Materials Inventory Statements


MAQ
Overfill
Alarm Systems
Facility/Control Area Design
Ventilation
Permits
Security
Fire Code
Explosion control
Fire suppression systems
Separation of incompatibles
Secondary containment
Tank/Container Design
Marking/Labeling
Area Signage
SDSs
Inspection
Emergency Plan
HazWaste
Accumulation Time limits
Transportation
Documentation
HMBP
Inventory
Release reporting

Chapter 50 Hazard Categories

Physical Hazards

- Organic peroxides
- Pyrophoric materials
- Unstable (reactive) materials
- Water reactive materials
- Cryogenic fluids
- Explosives and blasting agents
- Compressed gases
- Flammable and combustible liquids
- Flammable solids
- Combustible dusts and powders
- Combustible fibers
- Oxidizers

Health Hazards

- Highly toxic materials
- Toxic materials
- Corrosives

Compare with Federal Hazard Categories

NEW Categories (New CERS Data Fields 216f-216cc)	
PHYSICAL	***HEALTH HAZARD***
Flammable (gases, aerosols, liquids, or solids)	Carcinogenicity
Gas under pressure (compressed gas)	Acute toxicity (any route of exposure)
Explosive	Reproductive toxicity
Self-heating	Skin corrosion or irritation
Pyrophoric (liquid or solid)	Respiratory or skin sensitization
Oxidizer (liquid, solid or gas)	Serious eye damage or eye irritation
Organic peroxide	Specific target organ toxicity (single or repeated exposure)
Self-reactive	Aspiration Hazard
Pyrophoric gas	Germ cell mutagenicity
Corrosive to metal	Simple asphyxiant
In contact with water emits flammable gas	Hazard Not Otherwise Classified (HNOC)
Combustible dust	
Hazard Not Otherwise Classified (HNOC)	

Chapter 50 General Provisions

- All hazardous materials/all hazard classes
- Where **specific requirements** are provided in other chapters, the specific requirements shall apply
- Where a material has **multiple hazards**, all hazards shall be addressed

Chapter 50 General Provisions

Maximum Allowable Quantities

MAQ

- Maximum amount in a specific control area that is deemed reasonably safe by design for that quantity of hazardous material
- Once MAQ is exceeded, additional requirements apply
  - "Hazardous" occupancy – construction, electrical (Building Code)
  - Storage
  - Use, Dispensing and Handling

INDOOR – PHYSICAL HAZARD

TABLE 5003.1.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	Not Applicable	H-2	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable
Combustible fiber	Loose Baled[o]	H-3	(100) (1,000)	Not Applicable	Not Applicable	(100) (1,000)	Not Applicable	Not Applicable	(20) (200)	Not Applicable
Combustible liquid[c, l]	II IIIA IIIB	H-2 or H-3 H-2 or H-3 Not Applicable	Not Applicable	120[d, e] 330[d, e] 13,200[e, f]	Not Applicable	Not Applicable	120[d] 330[d] 13,200[f]	Not Applicable	Not Applicable	30[d] 80[d] 3,300[f]
Cryogenic Flammable	Not Applicable	H-2	Not Applicable	45[d]	Not Applicable	Not Applicable	45[d]	Not Applicable	Not Applicable	10[d]
Consumer fireworks	1.4G	H-3	125[d, e, l]	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Cryogenic Oxidizing	Not Applicable	H-3	Not Applicable	45[d]	Not Applicable	Not Applicable	45[d]	Not Applicable	Not Applicable	10[d]
Explosives	Division 1.1 Division 1.2 Division 1.3 Division 1.4 Division 1.4G Division 1.5 Division 1.6	H-1 H-1 H-1 or H-2 H-3 H-3 H-1 H-1	1[e, g] 1[e, g] 5[e, g] 50[e, g] 125[d, e, l] 1[e, g] 1[e, g]	(1)[e, g] (1)[e, g] (5)[e, g] (50)[e, g] Not Applicable (1)[e,g] Not Applicable	Not Applicable	0.25[g] 0.25[g] 1[g] 50[g] Not Applicable 0.25[g] Not Applicable	(0.25)[g] (0.25)[g] (1)[g] (50)[g] Not Applicable (0.25)[g] Not Applicable	Not Applicable	0.25[g] 0.25[g] 1[g] Not Applicable Not Applicable 0.25[g] Not Applicable	(0.25)[g] (0.25)[g] (1)[g] Not Applicable Not Applicable (0.25)[g] Not Applicable
Flammable gas	Gaseous Liquefied	H-2	Not Applicable	Not Applicable (150)[d, e]	1,000[d, e] Not Applicable	Not Applicable	Not Applicable (150)[d, e]	1,000[d, e] Not Applicable	Not Applicable	Not Applicable
Flammable liquid[c]	IA IB and IC	H-2 or H-3	Not Applicable	30[d, e] 120[d, e]	Not Applicable	Not Applicable	30[d] 120[d]	Not Applicable	Not Applicable	10[d] 30[d]
Flammable liquid, combination (IA, IB, IC)	Not Applicable	H-2 or H-3	Not Applicable	120[d, e, h]	Not Applicable	Not Applicable	120[d, h]	Not Applicable	Not Applicable	30[d, h]
Flammable solid	Not Applicable	H-3	125[d, e]	Not Applicable	Not Applicable	125[d]	Not Applicable	Not Applicable	25[d]	Not Applicable

(continued)

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Combustible fiber	Loose Baled[o]	H-3	(100) (1,000)	Not Applicable	Not Applicable	(100) (1,000)	Not Applicable	Not Applicable	(20) (200)	Not Applicable
Combustible liquid[c, l]	II IIIA IIIB	H-2 or H-3 H-2 or H-3 Not Applicable	Not Applicable	120[d, e] 330[d, e] 13,200[e, f]	Not Applicable	Not Applicable	120[d] 330[d] 13,200[f]	Not Applicable	Not Applicable	30[d] 80[d] 3,300[f]
Cryogenic Flammable	Not Applicable	H-2	Not Applicable	45[d]	Not Applicable	Not Applicable	45[d]	Not Applicable	Not Applicable	10[d]
Consumer fireworks	1.4G	H-3	125[d, e, l]	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
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Explosives	Division 1.1 Division 1.2 Division 1.3 Division 1.4 Division 1.4G Division 1.5 Division 1.6	H-1 H-1 H-1 or H-2 H-3 H-3 H-1 H-1	1[e, g] 1[e, g] 5[e, g] 50[e, g] 125[d, e, l] 1[e, g] 1[e, g]	(1)[e, g] (1)[e, g] (5)[e, g] (50)[e, g] Not Applicable (1)[e, g] Not Applicable	Not Applicable	0.25[g] 0.25[g] 1[g] 50[g] Not Applicable 0.25[g] Not Applicable	(0.25)[g] (0.25)[g] (1)[g] (50)[g] Not Applicable (0.25)[g] Not Applicable	Not Applicable	0.25[g] 0.25[g] 1[g] Not Applicable Not Applicable 0.25[g] Not Applicable	(0.25)[g] (0.25)[g] (1)[g] Not Applicable Not Applicable (0.25)[g] Not Applicable
Flammable gas	Gaseous Liquefied	H-2	Not Applicable	Not Applicable (150)[d, e]	1,000[d, e] Not Applicable	Not Applicable	Not Applicable (150)[d, e]	1,000[d, e] Not Applicable	Not Applicable	Not Applicable
Flammable liquid[c]	IA IB and IC	H-2 or H-3	Not Applicable	30[d, e] 120[d, e]	Not Applicable	Not Applicable	30[d] 120[d]	Not Applicable	Not Applicable	10[d] 30[d]
Flammable liquid, combination (IA, IB, IC)	Not Applicable	H-2 or H-3	Not Applicable	120[d, e, h]	Not Applicable	Not Applicable	120[d, h]	Not Applicable	Not Applicable	30[d, h]
Flammable solid	Not Applicable	H-3	125[d, e]	Not Applicable	Not Applicable	125[d]	Not Applicable	Not Applicable	25[d]	Not Applicable

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INDOOR – PHYSICAL HAZ

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Combustible	Not	H-2	See Note g	Not	Not	See Note g	Not	Not	See Note g	Not
liquid, combination (IA, IB, IC)	Not Applicable	H-2 or H-3	Not Applicable	120[d, e, h]	Not Applicable	Not Applicable	120[d, h]	Not Applicable	Not Applicable	30[d, h]
Flammable solid	Not Applicable	H-3	125[d, e]	Not Applicable	Not Applicable	125[d]	Not Applicable	Not Applicable	25[d]	Not Applicable

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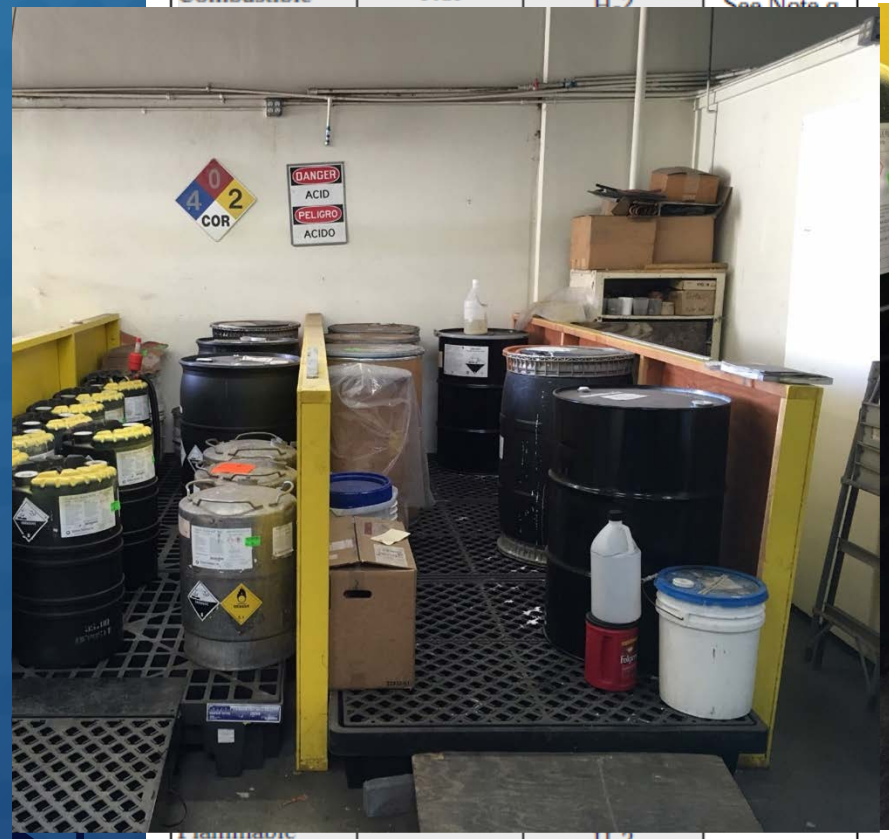

INDOOR – PHYSICAL HAZARD

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Combustible liquid[c, l]										
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Consumer fireworks										
Cryogenic Oxidizing										
Explosives										
Flammable gas										
Flammable liquid[c]										
Flammable liquid, combinat (IA, IB, I										
Flammable solid	Not Applicable	H-3	125[d, e]	Not Applicable	Not Applicable	125[d]	Not Applicable	Not Applicable	25[d]	Not Applicable

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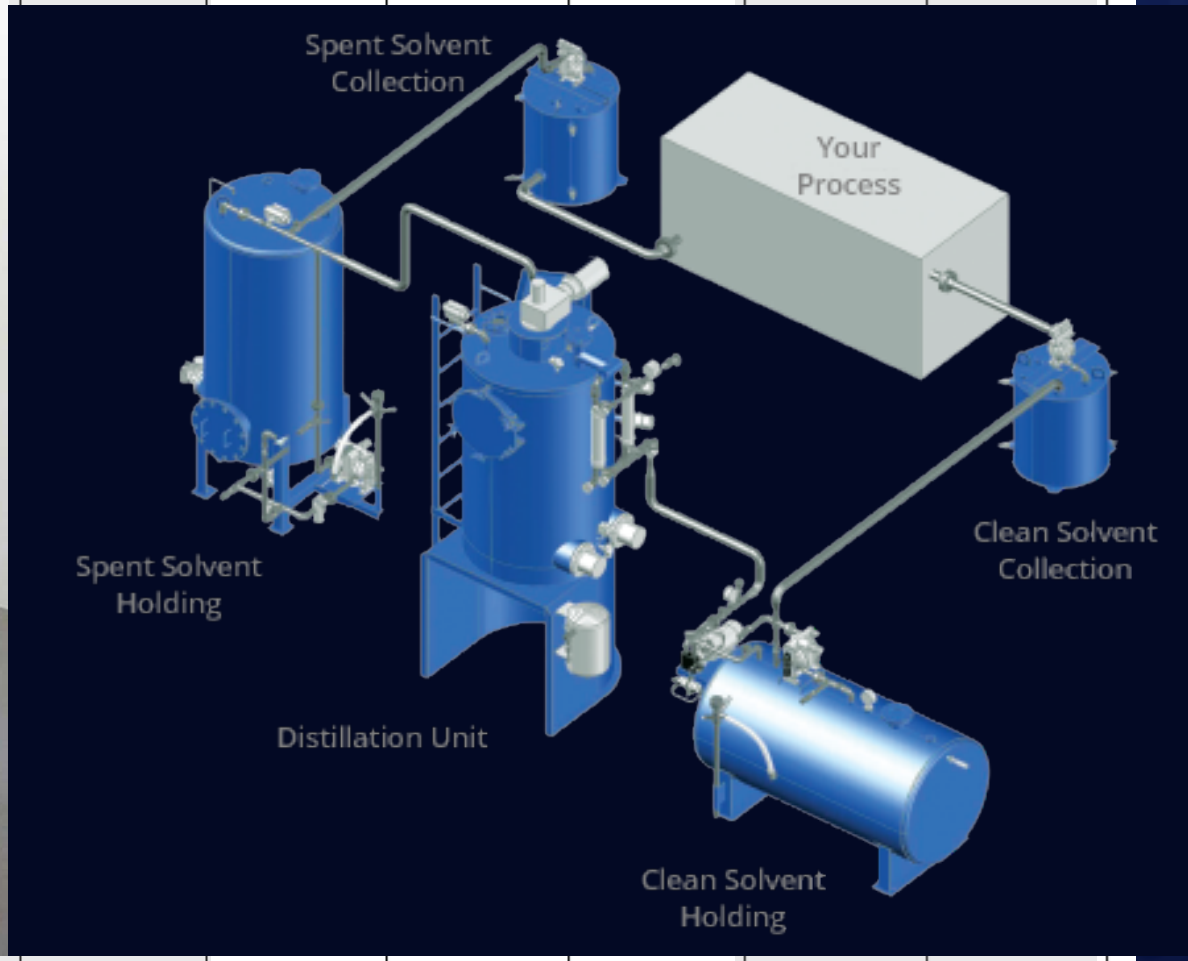

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Combustible dust	Not Applicable	H-2	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable
Combustible fiber	Loose Baled[o]	H-3	(100) (1,000)	Not Applicable	Not Applicable	(100) (1,000)	Not Applicable	Not Applicable	(20) (200)	Not Applicable
Flammable liquid[c]	IA IB and IC	H-2 or H-3	Not Applicable	30 120[d, e]	Not Applicable	Not Applicable	30 120[d]	Not Applicable	Not Applicable	10 30[d]
Flammable liquid, combination (IA, IB, IC)	Not Applicable	H-2 or H-3	Not Applicable	120[d, e, h]	Not Applicable	Not Applicable	120[d, h]	Not Applicable	Not Applicable	30[d, h]
Flammable solid	Not Applicable	H-3	125[d, e]	Not Applicable	Not Applicable	125[d]	Not Applicable	Not Applicable	25[d]	Not Applicable

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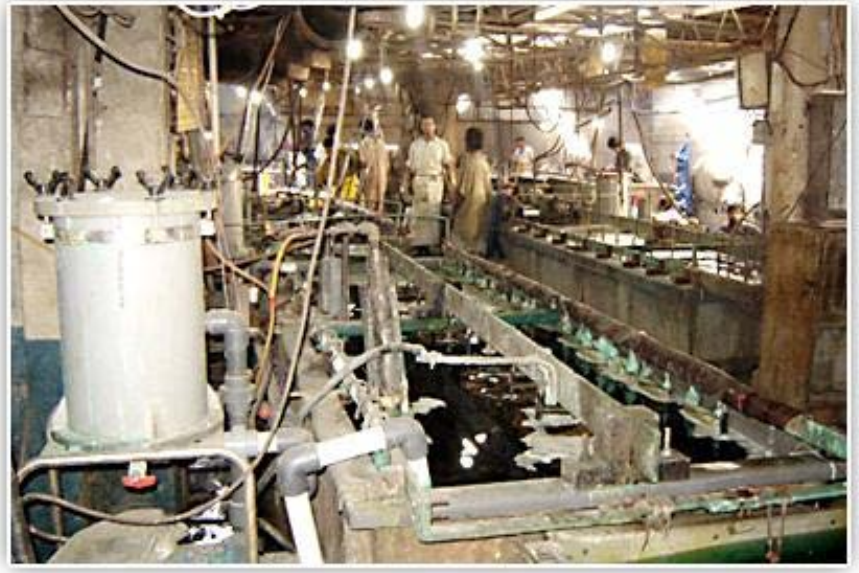

INDOOR – PHYSICAL HAZARD

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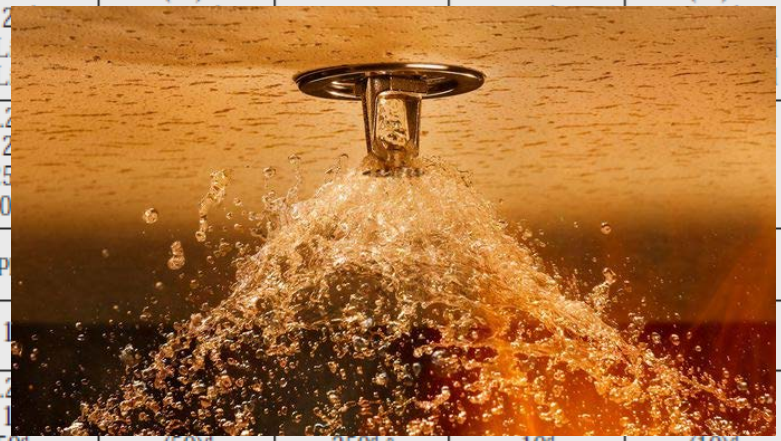
Inert Gas	Gaseous Liquefied	Not Applicable Not	Not Applicable Not	Not Applicable Not	Not Limited Not	Not Applicable Not	Not Applicable Not	Not Limited Not	Not Applicable Not	Not Applicable Not
Cryogenic						pplicable Not pplicable	Applicable Not Applicable	Limited Not Limited	Applicable Not Applicable	Applicable Not Applicable
Organic per						0.25[g] 1[d] 50[d] 12 ot L ot L	(0.25)[g] (1)[d] (50)[d]	Not	0.25[g] 1[d] 10[d]	(0.25)[g] (1)[d] (10)[d]
Oxidizer						0.2 2 25 4,0				
Oxidizing g						Ap				
Pyrophoric						1				
Unstable (re						0.2 1 50[d] ot Limited	(50)[d] Not Limited	250[d, e] Not Limited	10[d] Not Limited	(10)[d] Not Limited
Water react						5[d] 50[d] ot Limited	(5)[d] (50)[d] Not Limited	Not Applicable	1[d] 10[d] Not Limited	(1)[d] (10)[d] Not Limited

Maximum allowable quantities shall be increased 100 percent in buildings equipped with approved automatic sprinkler systems



For SI: 1 cub

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs, consumer or industrial products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

INDOOR – PHYSICAL HAZARD

TABLE 5003.1.1(1)—continued
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, exhausted enclosures, or listed safety cans. Listed safety cans shall be in accordance with Section 5003.9.10. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not

i. The maximum a

j. Quantities in pa

k. A maximum qu
storage containe

l. Net weight of p
packaging shall

m. For gallons of li

n. For storage and

o. Densely-packed

p. The following s
1. Liquid or g
2. Liquid or g
3. Gaseous fu
4. Liquid fuels

q. Where manufac

Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, dry boxes, gas cabinets, exhausted enclosures, or listed safety cans.

Approved:

Acceptable to the Fire Code Official

INDOOR – PHYSICAL HAZARD

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f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containir

i. The maxi

j. Quantitie

k. A maxim when the storage containers and the manner of storage are approved.

l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with n 5003.11, see 5003.11.1.

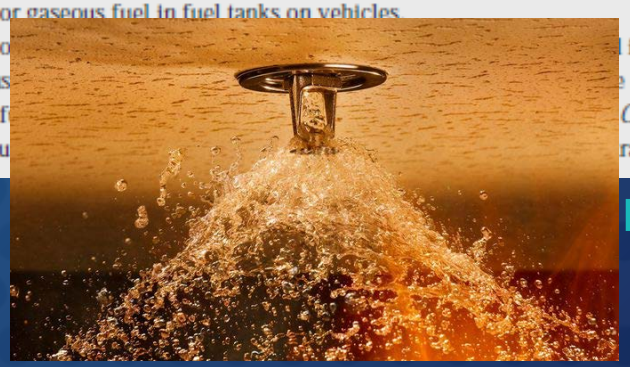
o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included i aterial class.

p. The following shall not be included in determining the maximum allowable quantities:

1. Liquid or gaseous fuel in fuel tanks on vehicles
2. Liquid o in accordance with this code.
3. Gaseous *California Mechanical Code.*
4. Liquid f *California Mechanical Code*

q. Where manu ration ar nditions fir ed in accordance with Section 10 2.

Footnote d & e are applied accumulatively

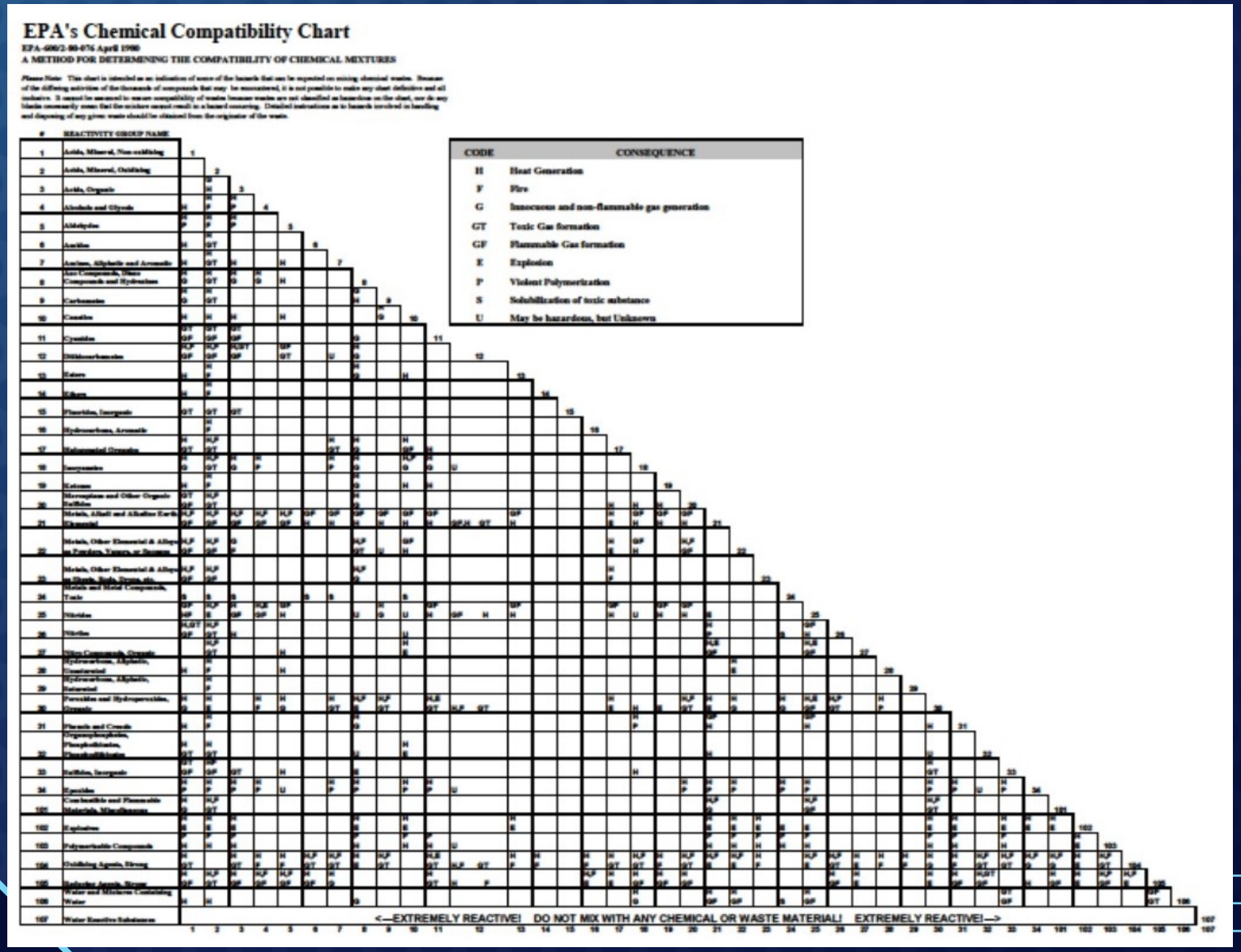


+

= 4x MAQ

Chapter 50 Incompatible Storage

Chapter 50 Incompatible Storage



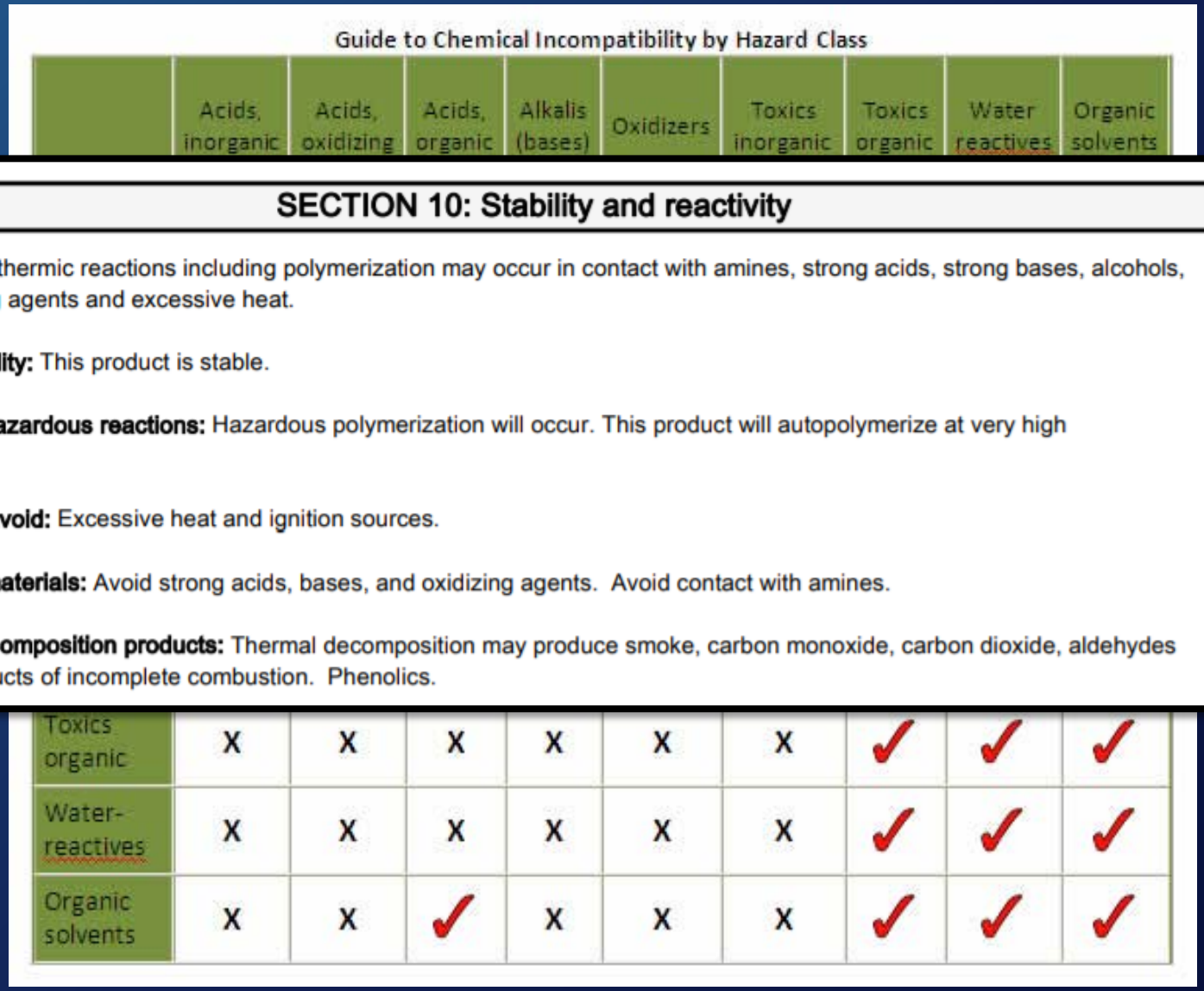
Chapter 50 Incompatible Storage

#	REACTIVITY GROUP NAME	1	2	3	4	5	6	7	8	9	10
1	Acids, Mineral, Non-oxidizing										
2	Acids, Mineral, Oxidizing										
3	Acids, Organic		G H								
4	Alcohols and Glycols	H	H F	H P							
5	Aldehydes	H P	H F	H P							
6	Amides	H	H GT								
7	Amines, Aliphatic and Aromatic	H	H GT	H		H					
8	Azo Compounds, Diazo Compounds and Hydrazines	H G	H GT	H G	H G	H					
9	Carbamates	H G	H GT						G H		
10	Caustics	H	H	H		H				H G	

CODE	CONSEQUENCE
H	Heat Generation
F	Fire
G	Innocuous and non-flammable gas generation
GT	Toxic Gas formation
GF	Flammable Gas formation
E	Explosion
P	Violent Polymerization
S	Solubilization of toxic substance
U	May be hazardous, but Unknown

Chapter 50 Incompatible Storage

- Lots of Tools
- Always consult SDS
  - Section 10 – Stability and Reactivity



Guide to Chemical Incompatibility by Hazard Class

	Acids, inorganic	Acids, oxidizing	Acids, organic	Alkalis (bases)	Oxidizers	Toxics inorganic	Toxics organic	Water reactives	Organic solvents
Toxics organic	X	X	X	X	X	X	✓	✓	✓
Water-reactives	X	X	X	X	X	X	✓	✓	✓
Organic solvents	X	X	✓	X	X	X	✓	✓	✓

SECTION 10: Stability and reactivity

Reactivity: Exothermic reactions including polymerization may occur in contact with amines, strong acids, strong bases, alcohols, strong oxidizing agents and excessive heat.

Chemical stability: This product is stable.

Possibility of hazardous reactions: Hazardous polymerization will occur. This product will autopolymerize at very high temperatures.

Conditions to avoid: Excessive heat and ignition sources.

Incompatible materials: Avoid strong acids, bases, and oxidizing agents. Avoid contact with amines.

Hazardous decomposition products: Thermal decomposition may produce smoke, carbon monoxide, carbon dioxide, aldehydes and other products of incomplete combustion. Phenolics.

Chapter 50 Take Aways

- Watch for maximum allowable quantities
- Make sure you know basic incompatibility

Pre-incident Planning & Hazmat

Hazmat & Pre-incident Planning

- What is Pre-incident Planning?
- What do Fire Departments/Hazmat Response Teams do with CERS inventories before/during an incident?
- Reinforce importance of accurate, current inventories & maps

Video:

What is Pre-incident Planning

- **NFPA 1620, Standard for Pre-incident Planning**
- **Process** – Data collection, Plan development, Plan distribution, how it is used during incident, revised occasionally

- **Pre-incident Plan** – A document developed by gathering general and detailed data that is used by responding personnel in effectively managing emergency for the protection of occupants, participants, responding personnel, property and the environment

Information in a Pre-Incident Plan

- Physical and site considerations
- Occupancy considerations
- Water supplies and fire protection systems
- Special considerations
  - Hazmat
  - Vacant and abandoned structures
  - Buildings under construction

Pre Incident Plan Document

- Each FD has a different final format for pre-incident planning
  - Building Card with Data
  - Maps - from CAD or handmade
  - Aerial Photos + Annotations
  - GIS-based maps with data integrations

Examples please...

BUILDING INFORMATION

Date of Pre-Incident Plan: 04/03/2018

Address: 1212 Hudson Street

Location Name: Ellson Building

Lock Box Location: Side-A

Construction Type: Ordinary

Length × Width × Height: 30.5 m × 15.2 m × 22.9 m (100 ft × 50 ft × 75 ft)

No. of Stories: 7

Occupancy Type: Residential

Primary Entrance: Side-A

Secondary Entrance: Side-D

EXPOSURES TO BUILDING

Side-A: Hudson Street

Side-C: Yard

Side-B: 6-story/ordinary const./attached

Side-D: 2½-story/wood frame const./detached 4.6 m (15 ft)

STAIRS

Roof Access: Off Stair-A

Belowgrade Access: Off Stair-B

WATER SOURCE

Fire Hydrant Locations

Primary: 1216 Hudson St.

Size of main: 12 in. (305 mm)

Secondary: 236 13th St.

Size of main: 8 in. (203 mm)

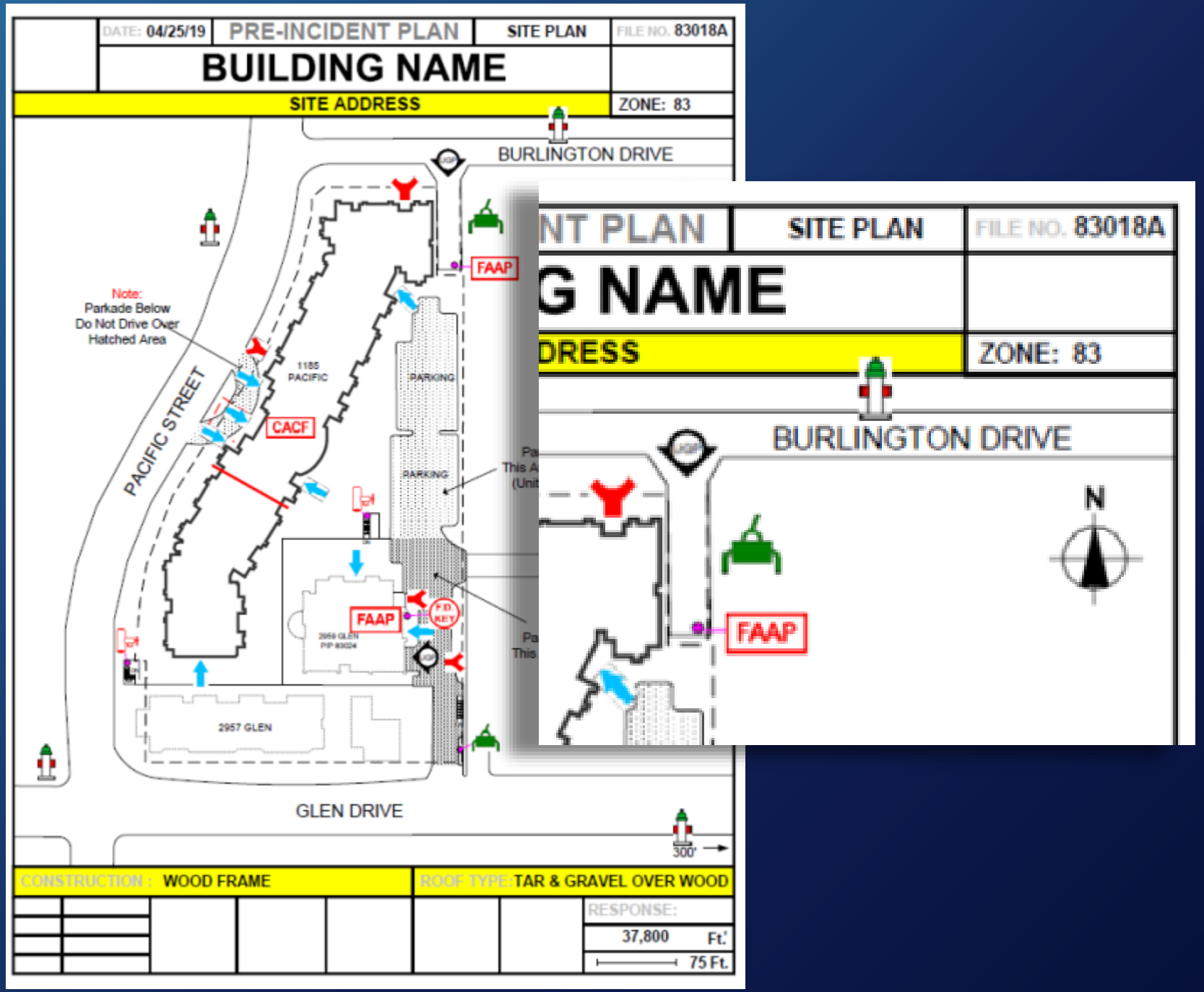
FIRE PROTECTION SYSTEMS

Combination Sprinkler/Standpipe System

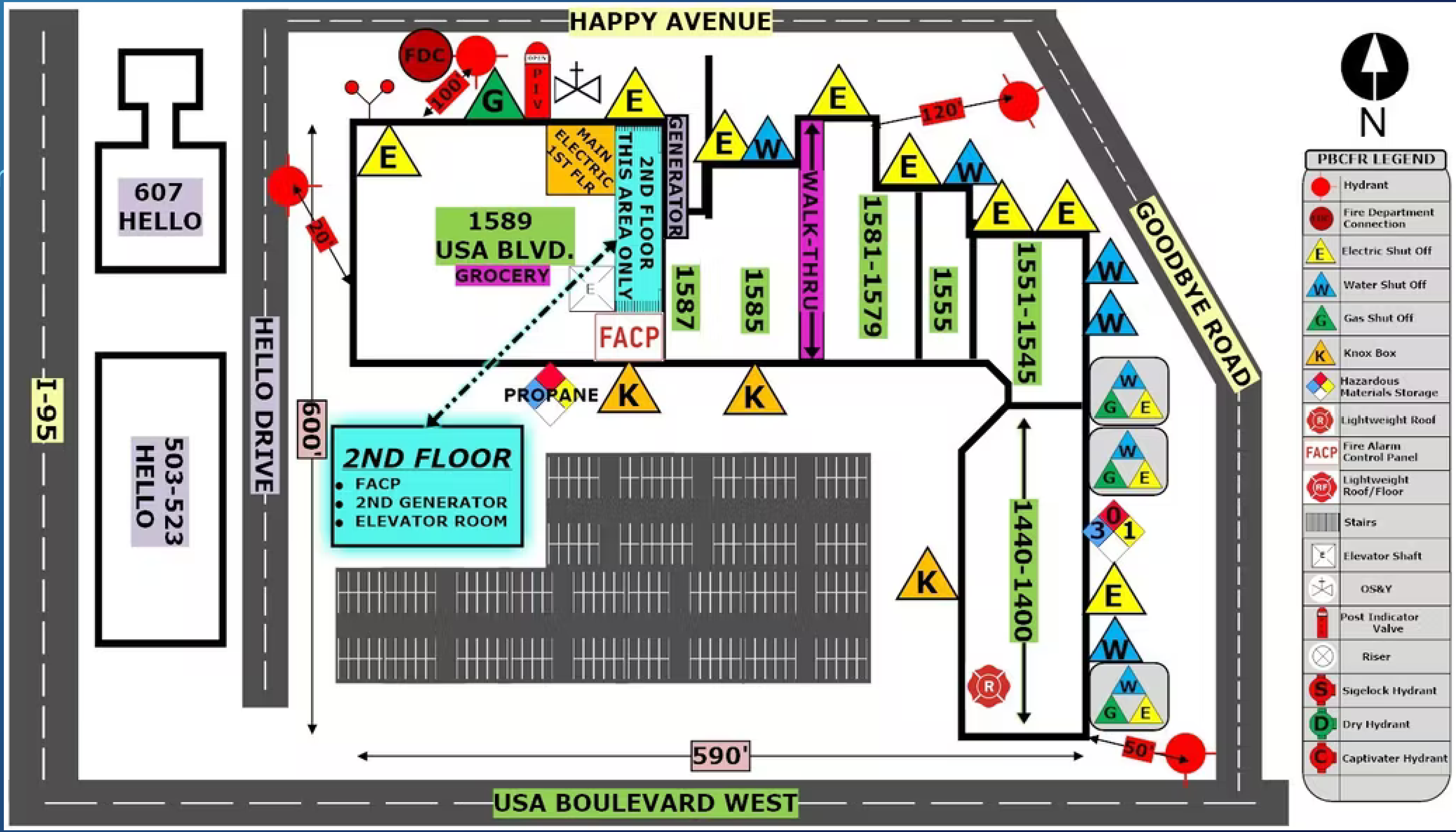
FDC Location(s): Side-A

Standpipe Riser Hose Connection: Stair-B

Fire Alarm Control Panel (FACP): Main lobby


DATE: 04/25/19
PRE-INCIDENT PLAN
SITE PLAN
FILE NO. 83018A
BUILDING NAME
SITE ADDRESS
ZONE: 83
BURLINGTON DRIVE
FAAP
Note:
Parkade Below
Do Not Drive Over
Hatched Area
1185
PACIFIC
PACIFIC STREET
CACF
PARKING
PARKING
FAAP
F.D.
KEY
2957 GLEN
GLEN DRIVE
300'
CONSTRUCTION : WOOD FRAME
ROOF TYPE: TAR & GRAVEL OVER WOOD
RESPONSE:
37,800 Ft.'
75 Ft.
SITE PLAN
FILE NO. 83018A
ZONE: 83
BURLINGTON DRIVE
N
FAAP

- Pr


HAPPY AVENUE
FDC
100'
G
P I V
E
GENERATOR
E
W
E
120'
E
W
E
E
607 HELLO
20'
MAIN ELECTRIC 1ST FLR
2ND FLOOR THIS AREA ONLY
1589 USA BLVD.
GROCERY
FACP
1587
1585
WALK-THRU
1581-1579
1555
1551-1545
W
W
GOODBYE ROAD
HELLO DRIVE
600'
PROPANE
K
K
I-95
503-523 HELLO
2ND FLOOR
FACP
2ND GENERATOR
ELEVATOR ROOM
K
1440-1400
0 3 1
E
W
R
590'
50'
USA BOULEVARD WEST
N
PBCFR LEGEND
Hydrant
Fire Department Connection
Electric Shut Off
Water Shut Off
Gas Shut Off
Knox Box
Hazardous Materials Storage
Lightweight Roof
Fire Alarm Control Panel
Lightweight Roof/Floor
Stairs
Elevator Shaft
OS&Y
Post Indicator Valve
Riser
Sigelock Hydrant
Dry Hydrant
Captivater Hydrant


Elementary School
6011 Allen Street, Anytown USA
School Main No: (999) 555-1212
Emer: (999) 555-1213
Fire and Security: ABC Security (888) 555-1212
Account No: 1234
N
GENERAL NOTES:
PUBLIC ELEMENTARY SCHOOL WITH APPROX. 460 STUDENTS, 35 STAFF
ALL BUILDINGS ARE FULLY SPRINKLERED
KNOX IS TO RIGHT OF MAIN OFFICE ENTRANCE
AP DISPLAY IS TO LEFT INSIDE OFFICE, AP CONTROL IS IN DATA ROOM ON NORTH (B) SIDE OF ADMIN BLDG
BUILDING CONSTRUCTION IS WOOD / STUCCO WITH STEEL AND ROLLED TAR ROOFS
600
B WING IS TWO STORIES
FIRST FLOOR ROOMS
SECOND FLOOR ROOMS
BLACKTOP
FIELDS
BASEBALL FIELD
ELEMENTARY PLAY STRUCTURE
COURTYARD
MULTI-USE ROOM
ADMIN OFFICE
LIBRARY
CHILD CARE OFFICE
KINDERGARTEN PLAYAREA
KIDS COUNTRY PLAYAREA
ELEC BREAKER IS IN DATA ROOM NEAR OFFICE
FIRE OS&Y
FOR B BLDG
FOR ADMIN BLDG
FOR MULTI USE
EVA
EXIT
GATE
FENCE
MAIN STREET
ALLEN STREET
EIGHTH STREET
NORTH STREET
STAFF PARKING
PARKING
ENTRY
MAIN DOMESTIC VALVE & METER
5039
5045
5051
5057
5063
5069
5075
5081
5087
5093
5099

Pre-Incident Plan Dashboard

Pre-Incident Planning Dashboard can be used by Fire Service personnel to to monitor progress of the pre-incident plan program.

Adjust the filters or current map extent to refine the results.

Fire Station

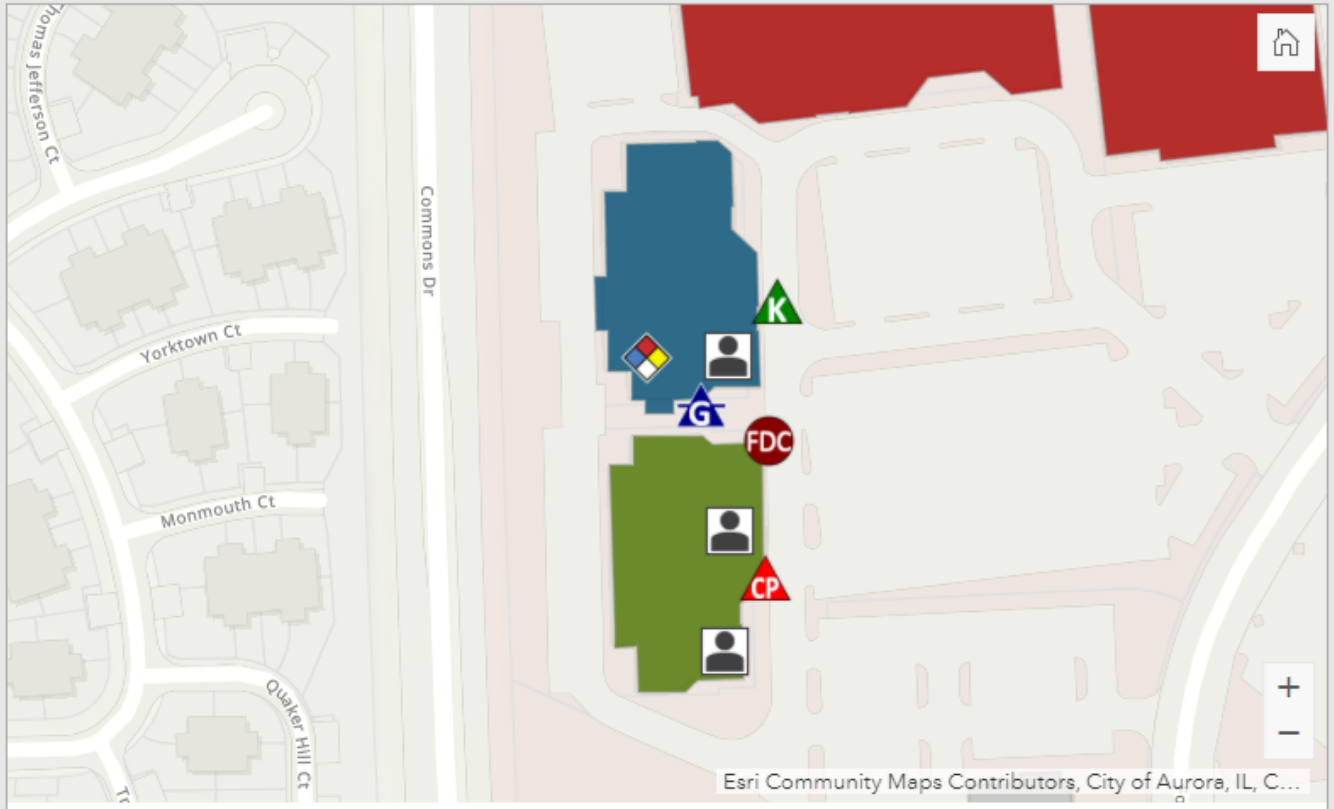
- (●) All
- ( ) 5
- ( ) 6
- ( ) 7
- ( ) 8
- ( ) 9

Pre-Incident Plan Status

- [ ] Approved
- [ ] Assigned
- [ ] Unassigned
- [ ] Under Review

Inspection Date

All



Pre-Incident Plans by Fire Station

Pre-Incident Plans

4

- 4070 Fox Valley Ctr Dr
  Assigned
- 4054 Fox Valley Center Dr
  Assigned
- 4030 Fox Valley Center Dr
  Under Review
- 4008 Fox Valley Center Dr
  Approved
- 4000 Fox Valley Centr
  Unassigned

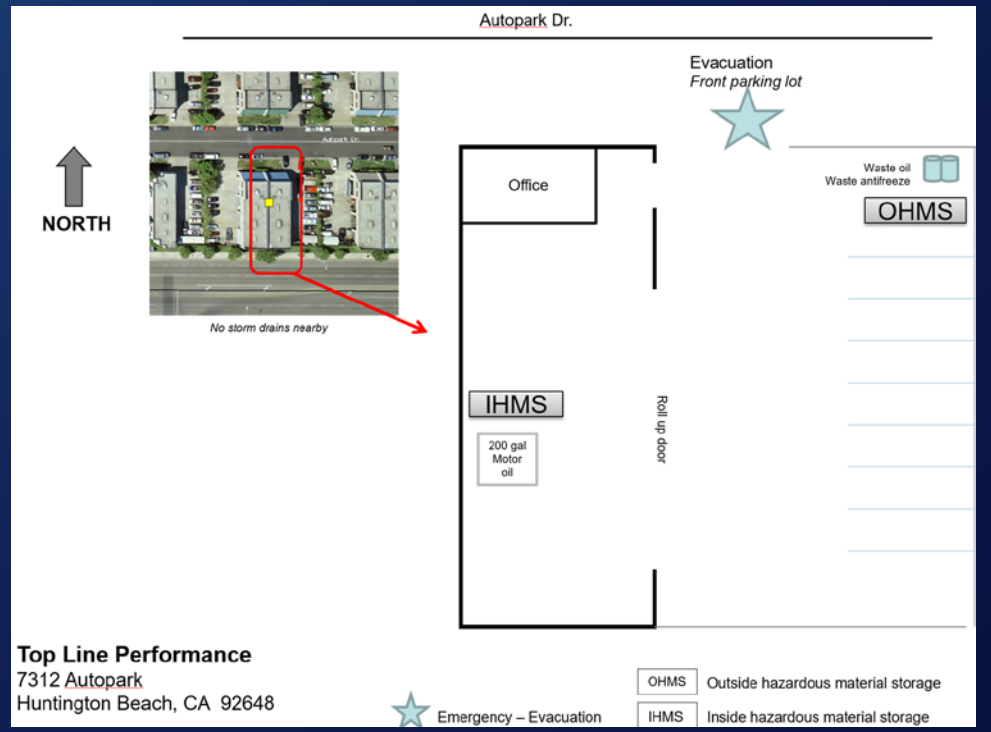
Video:


first due
RES STRUCTURE FIRE
415 VANDALIA ST, PITTSB...
Jul 14, 2020 08:32:28
DOMESTIC DISTRUBANCE
1302 LIPAN TRAIL, AUSTI...
Jul 14, 2020 08:29:51
COMM STRUCTURE FIRE
2502 ALGERIAN WAY, HOUS...
Jul 14, 2020 08:29:31
COMM STRUCTURE FIRE
3800 CALLE TECATE, CA
Jul 14, 2020 08:28:53
B
7th Floor
5th
4th
3rd
2nd
1st
Ground
FDC
FDC
Map
Satellite
Google
ArcGIS
Google

Pre-incident Plan - use of Symbology

- Why have a standard on tactical maps used for PIP?
- Current standards:
  - NFPA 1620 references NFPA 170, Standard for Fire Safety and Emergency Symbols
  - NAPSG Foundation https://www.napsgfoundation.org/all-resources/symbology-library/

- What is the standard for symbology in CERS site maps?



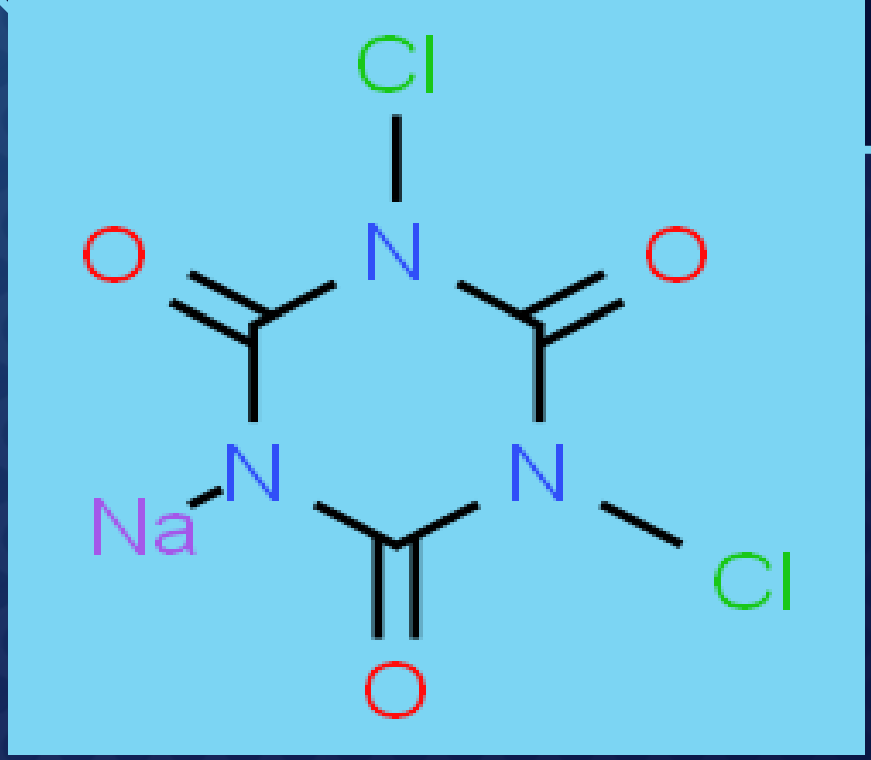
Optima Belle LLC Explosion and Fire

- The Optima Belle facility in Belle, WV experienced an explosion event on December 8, 2020.
- The explosion occurred in an industrial dryer unit.
- Optima Belle was performing a process to remove water from chlorinated dry bleach.
- One worker was fatally injured.
- The explosion resulted in multiple projectiles.
- One of the projectiles landed on the nearby highway and injured a local resident.
- Optima Belle was performing a trial batch process operation for the Clearon Corporation.
- The explosion occurred during the first trial batch.

- Dark specks were observed in the chlorinated dry bleach powder shortly before the incident, causing the powder samples to fail visual inspection multiple times before the incident.
- Chemicals present at the facility include Methanol and “CBD 63”.

- The initial explosion occurred in a 1600 gallon dual cone dryer.
- While Methanol was present in piping surrounding the building where the explosion took place, it is unlikely to have been involved in the initial explosion
- What is “CBD 63” and how might it have to contributed to the explosion?

- CBD 63 is one brand name for Dichloroisocyanuric Acid Sodium Salt
- It's a dry bleach used in cleaning compounds and swimming pool disinfectants
- Let see what the SDS can tell us…



SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Oxidizing solids	Category 2 (H272)

Health hazards

Acute oral toxicity	Category 4 (H302)
Serious Eye Damage/Eye Irritation	Category 2 (H319)
Specific target organ toxicity - (single exposure)	Category 3 (H335)

Environmental hazards

Acute aquatic toxicity	Category 1 (H400)
Chronic aquatic toxicity	Category 1 (H410)

Maybe the Hazard Statements can tell us something…

2.2. Label elements

Signal Word **Danger**

Hazard Statements

H272 - May intensify fire; oxidizer
H302 - Harmful if swallowed
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation
H410 - Very toxic to aquatic life with long lasting effects
EUH031 - Contact with acids liberates toxic gas

SECTION 5: FIREFIGHTING MEASURES

5.2. Special hazards arising from the substance or mixture

May ignite combustibles (wood paper, oil, clothing, etc.). Risk of explosion by shock, friction, fire or other sources of ignition.

Oxidizer: Contact with combustible/organic material may cause fire.

Hazardous Combustion Products

Carbon monoxide (CO), Carbon dioxide (CO_2), Nitrogen oxides (NOx).

cial Remarks on Hazards	The material itself is not combustible, but if contaminated with a combustible or organic material (e.g. organic matter, wood, paper, oil, sawdust, floor sweepings, easily oxidized organics) ignition can result. It will accelerate the burning of combustible materials. Reaction with ammonium salts, or foreign substances may also increase fire hazard. Do not use dry chemical extinguishers containing ammonium compounds.

Section 10. Stability and Reactivity Data

Conditions of Instability	Excess heat, dust generation, incompatible materials, water
Incompatibility with various substances	Reactive with reducing agents, combustible materials, organic materials. Slightly reactive to reactive with moisture.
pecial Remarks on Reactivity	Reacts with ammonia or amines to produce nitrogen trichloride. Reacts with most reducing agents. Reacts with water, releasing chlorine gas and nitrogen trichloride. Reacts with combustible materials, ammonium salts. Reacts with sodium carbonate (soda ash) Reacts with other strong oxidizers such as calcium hypochlorite, hydrogen peroxide.

Reacts with water, releasing chlorine gas and nitrogen trichloride.

WHAT'S NITROGEN TRICHLORIDE?

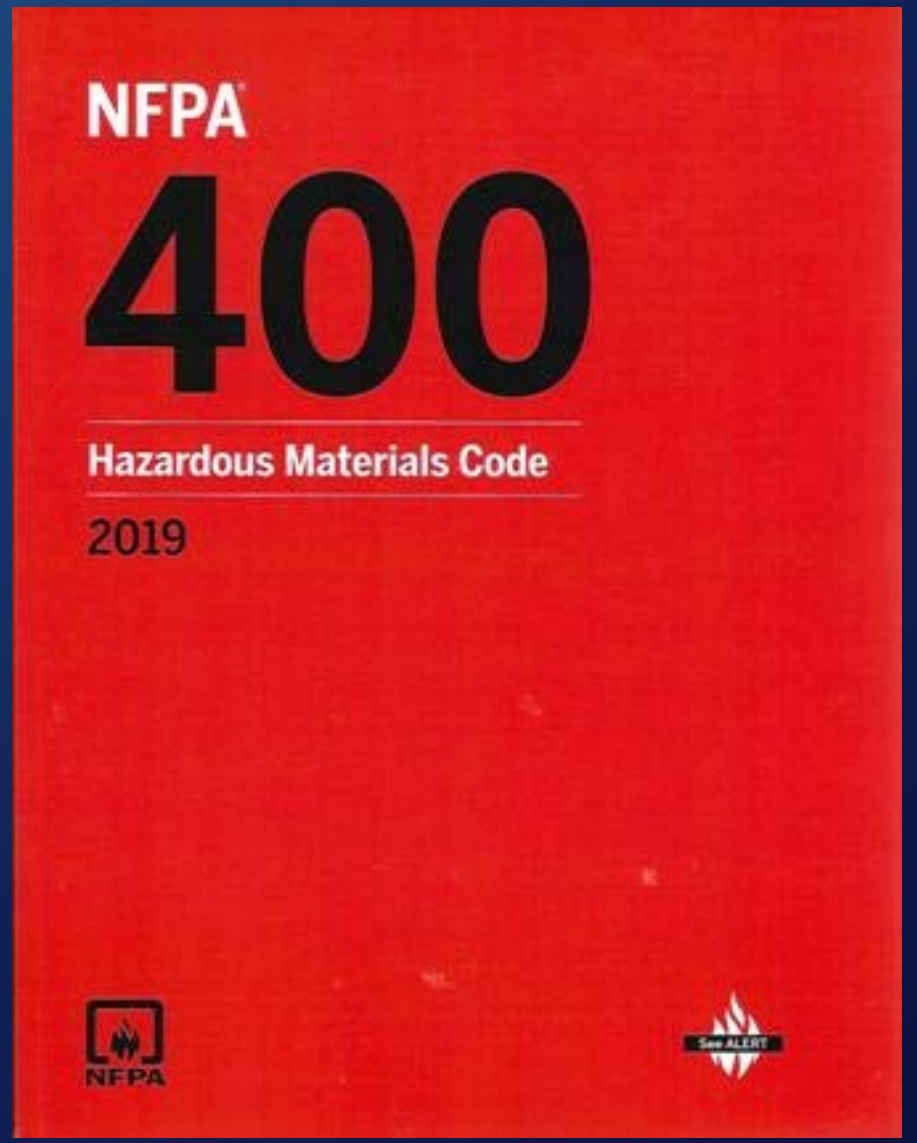
- First made in 1812 by Pierre Louis Dulong
- The discovery cost him an eye and two fingers
- Extremely unstable
- Not in widespread commercial use

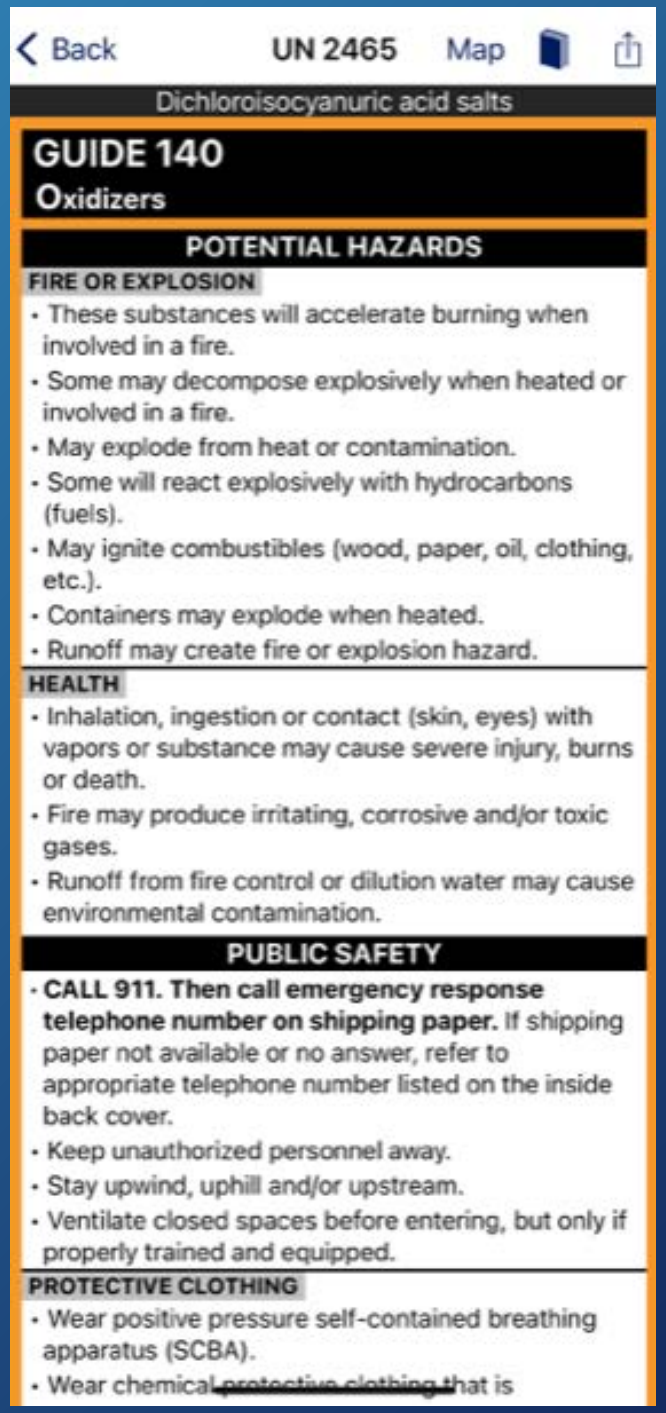
So How Should This Stuff Be Handled?

Section 7. Handling and Storage

Precautions	Keep away from heat. Keep away from sources of ignition. Keep away from combustible material.. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as reducing agents, combustible materials.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers.

- Note: The NFPA Standard referenced by the SDS (NFPA 43A) is obsolete.
- The requirements for Oxidizer Solids and Liquids are now in Chapter 15 of NFPA Standard 400 (Hazardous Materials Code)





Back UN 2465 Map

Dichloroisocyanuric acid salts

GUIDE 140
Oxidizers

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- These substances will accelerate burning when involved in a fire.
- Some may decompose explosively when heated or involved in a fire.
- May explode from heat or contamination.
- Some will react explosively with hydrocarbons (fuels).
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Containers may explode when heated.
- Runoff may create fire or explosion hazard.

HEALTH

- Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause environmental contamination.

PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is

- Here's the ERG guide for Dichloroisocyanuric Acid Salts

Probable Contributing Factors:

A strong oxidizing chemical impacted by

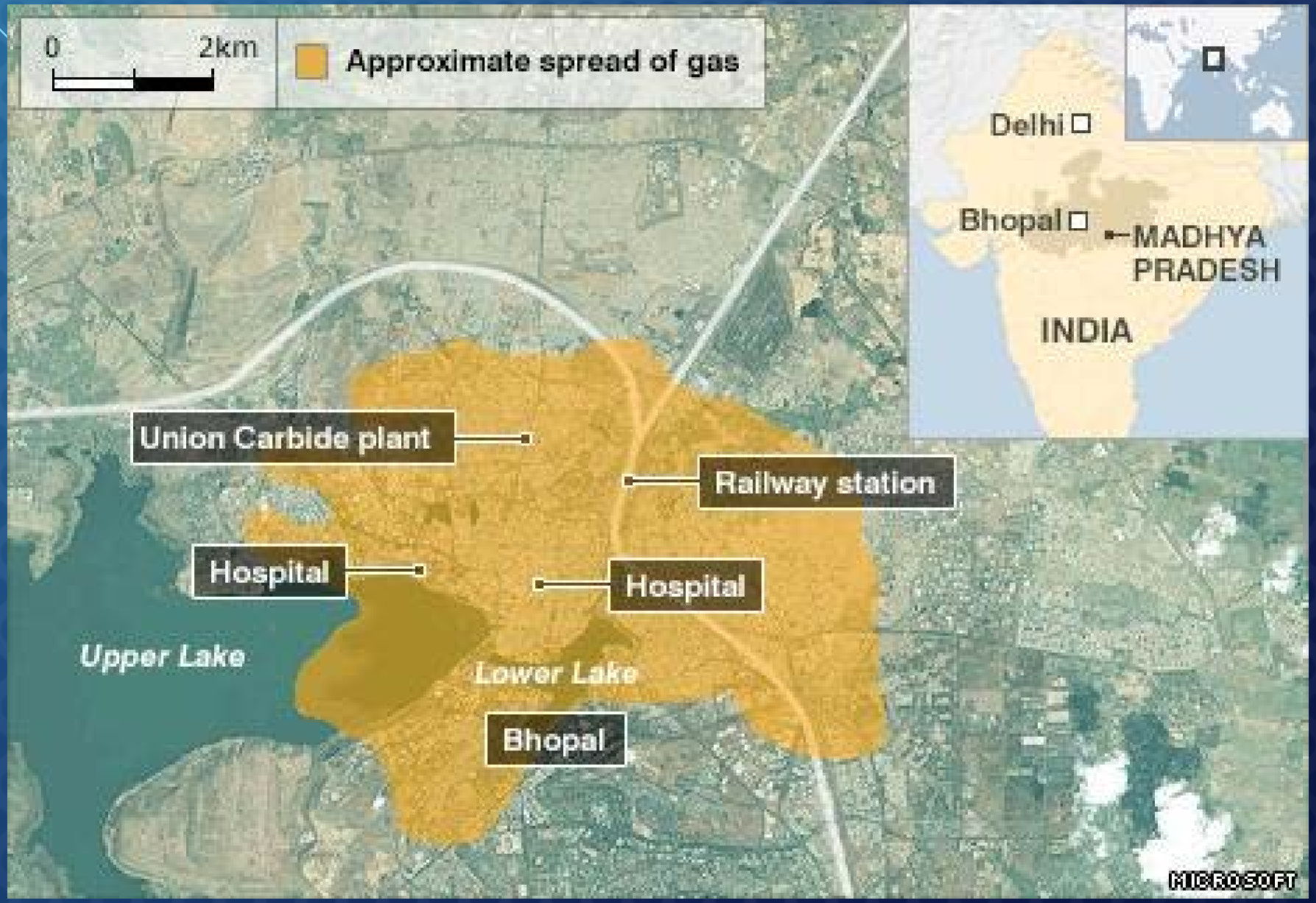
- Contamination (possibly w/organics)
- Heat
- Pressure
- Water

Resulting in

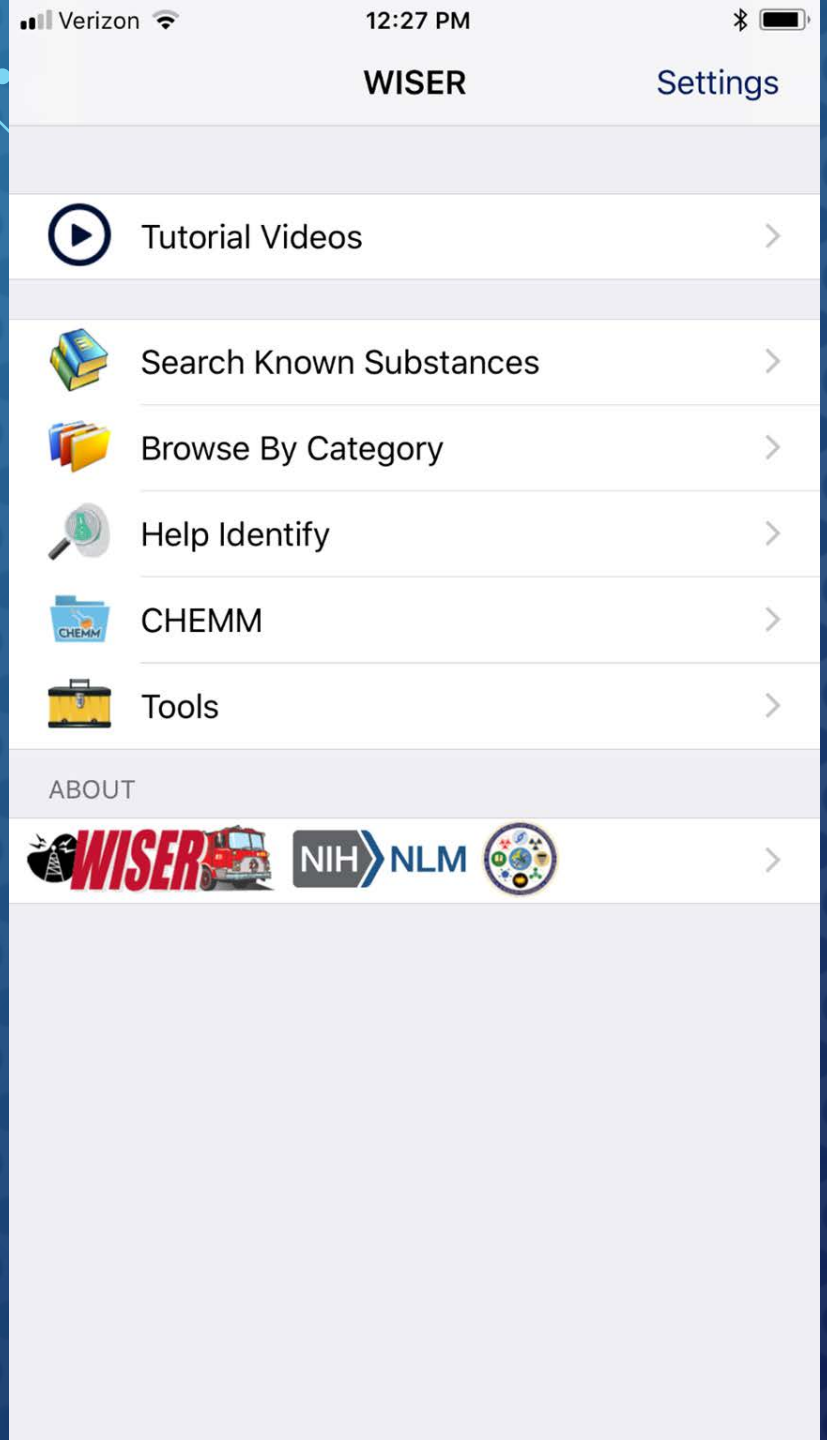
- Gas formation (Flam/OX)
- Combustion
- Possible formation of unstable compounds

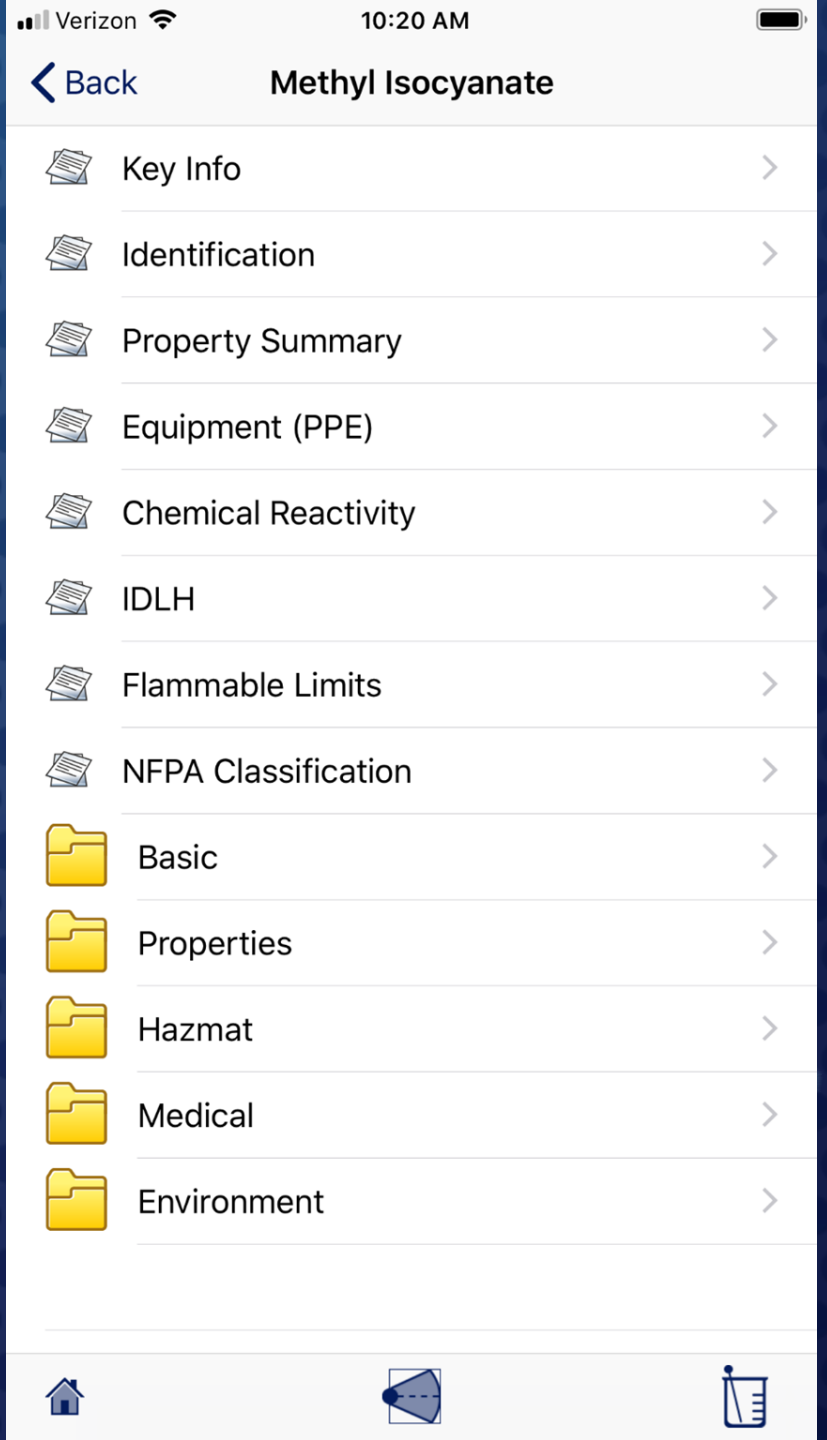
Bhopal Disaster

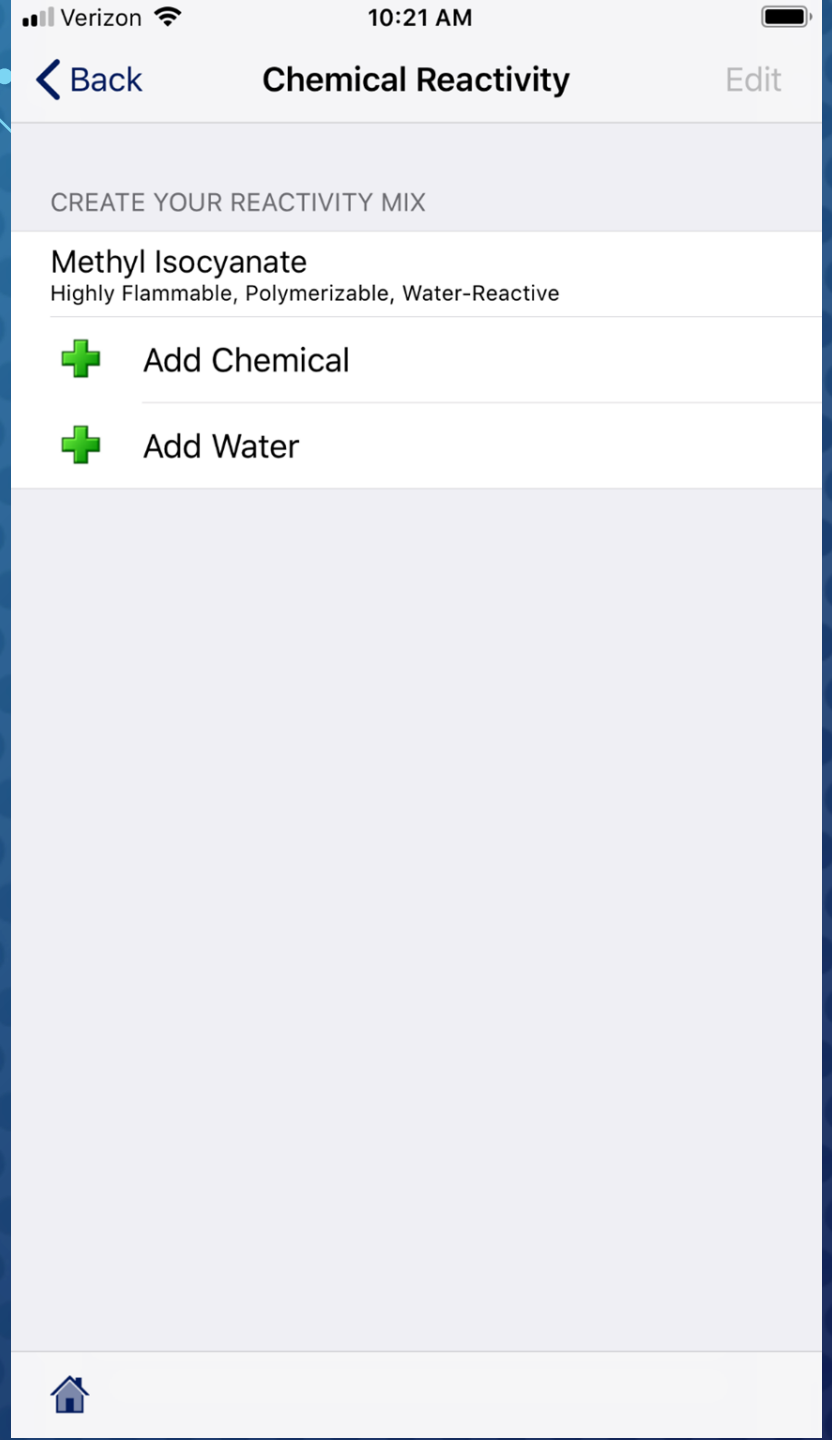
- Occurred the night of December 2, 1984 at Union Carbide plant
- Water entered a tank containing 42 tons of Methyl Isocyanate
- The ensuing gas leak reached neighboring communities
- Death toll estimates vary from 3,000 to 10,000


0
2km
Approximate spread of gas
Delhi
Bhopal
MADHYA PRADESH
INDIA
Union Carbide plant
Railway station
Hospital
Hospital
Upper Lake
Lower Lake
Bhopal
MICROSOFT


WISER


Verizon
12:27 PM
WISER
Settings
Tutorial Videos
Search Known Substances
Browse By Category
Help Identify
CHEMM
Tools
ABOUT
WISER
NIH NLM


Verizon
10:20 AM
Back
Methyl Isocyanate
Key Info
Identification
Property Summary
Equipment (PPE)
Chemical Reactivity
IDLH
Flammable Limits
NFPA Classification
Basic
Properties
Hazmat
Medical
Environment


Verizon
10:21 AM
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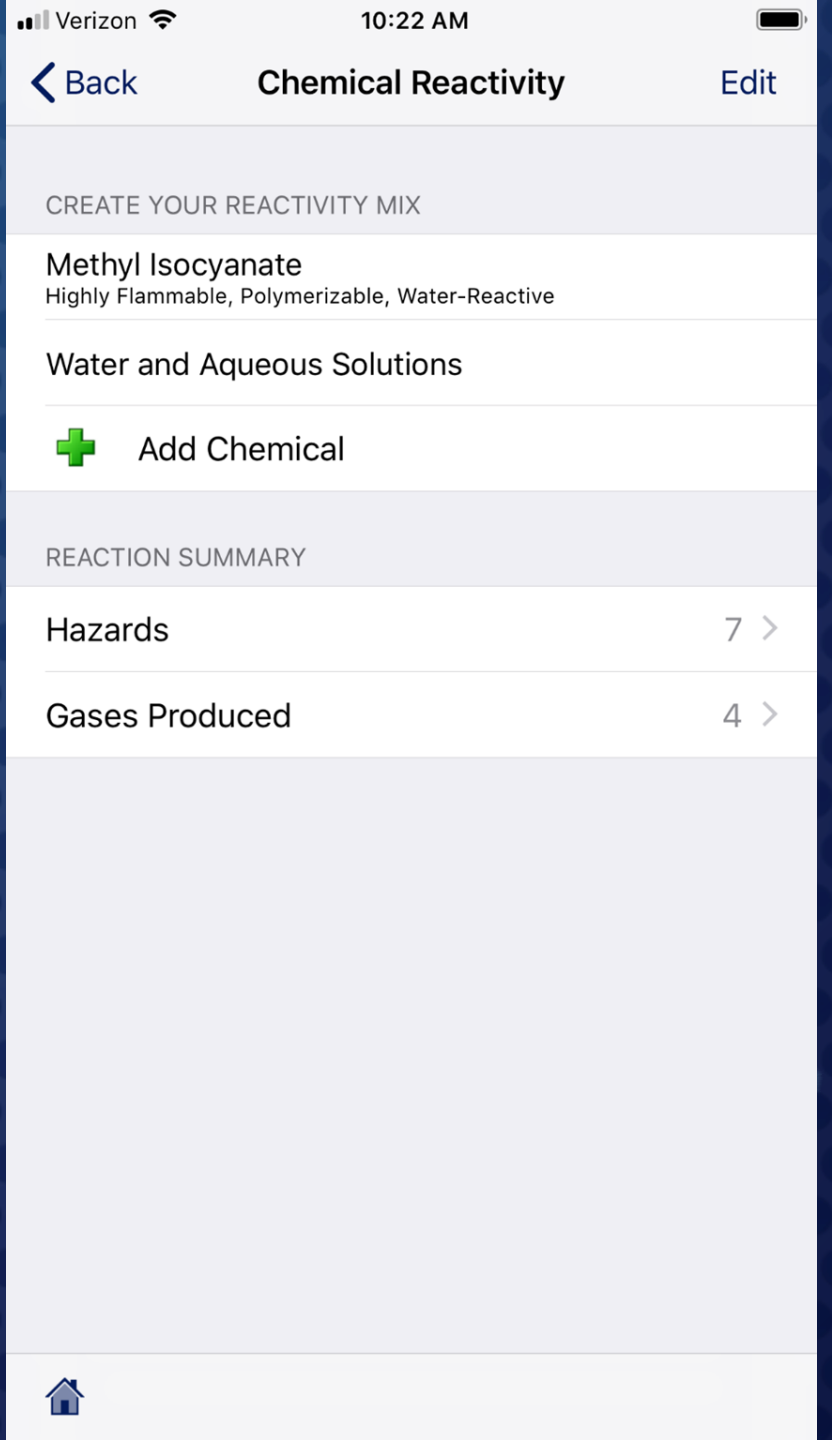
Chemical Reactivity
Edit
CREATE YOUR REACTIVITY MIX
Methyl Isocyanate
Highly Flammable, Polymerizable, Water-Reactive
Add Chemical
Add Water


Verizon
10:22 AM
Back
Chemical Reactivity
Edit
CREATE YOUR REACTIVITY MIX
Methyl Isocyanate
Highly Flammable, Polymerizable, Water-Reactive
Water and Aqueous Solutions
Add Chemical
REACTION SUMMARY
Hazards
7
Gases Produced
4

- Ammonia
- Carbonyl Sulfide
- Ethylene Oxide
- Hydrogen Cyanide

Isocyanates and Isothiocyanates + Water and Aqueous Solutions

Materials

Methyl Isocyanate + Water and Aqueous Solutions

Hazards


Reaction products may be corrosive


Reaction products may be flammable


Reaction liberates gaseous products and may cause pressurization


Exothermic reaction at ambient temperatures (releases heat)


Reaction products may be toxic

Hazard Notes

Isocyanates and Isothiocyanates WITH Water and Aqueous Solutions:

1) Methyl Isocyanate reacts exothermically with water to produce carbon dioxide, methylamine, dimethylurea and/or trimethylbiuret. Heat of reaction causes evolution of the vapors of the isocyanate. Reaction is relatively slow below 20 C but becomes violent at more elevated temperatures or in the presence of acids and bases. A 1984 release of methyl isocyanate in Bhopal, India

Summary

- Did you learn something new?
- We covered:
  - Evolution of Fire Code and HazMat regulations
  - CFC Chapter 50: MAQ's & Incompatibles
  - Pre-incident Planning
  - Examination of recent and historic incidents

THANK YOU!

GRANT MINER
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949 422 8527

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714 536 5565