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NFPA 400 Hazardous Materials Update

May 6, 2014

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- **Fire Code Consulting**
- **Owner Advocacy** – Representing facility owners with A&E Firms, Fire Alarm and Sprinkler contractors and Code Enforcement Officials.
- **Fire Protection Program Management**
- **Code Analysis:** New and existing buildings (suppression, alarms, egress, hazardous materials (HAZMAT), *etc*)
- **Building Code Consulting** (non-structural with focus on Chapters 1-10)
- **Hazardous Materials Consulting**
- **Life Safety and Egress Analysis**
- **Design Review/Plan Review**
- **Specification Development**
- **Fire Hazard Analyses**
- **Life Safety (Egress) Course Instruction**
- **Explosion Analysis**
- **Fire Alarm Systems** (including special detection and emergency voice alarm communication systems)
- **Fire Suppression Systems** Design and Review (fire sprinklers, standpipes, fire pumps, dry systems, pre-action systems, gaseous systems, *etc.*)
- **Health Care Occupancies** (Class I-1 and I-2 occupancies)
- **High Rise Building Fire Protection Systems**
- **Evacuation Plans**

NFPA 400

Background

- Why needed?
 - Address gaps
 - NFPA treatment of HAZMAT incomplete
 - Simplification
- 2010 1st Edition
 - Withdrawn Documents (absorbed in 400)
 - 430, *Oxidizers* (2004)
 - 432, *Organic Peroxides* (2002)
 - 434, *Pesticides* (2002)
 - 490, *Ammonium Nitrate* (2002)

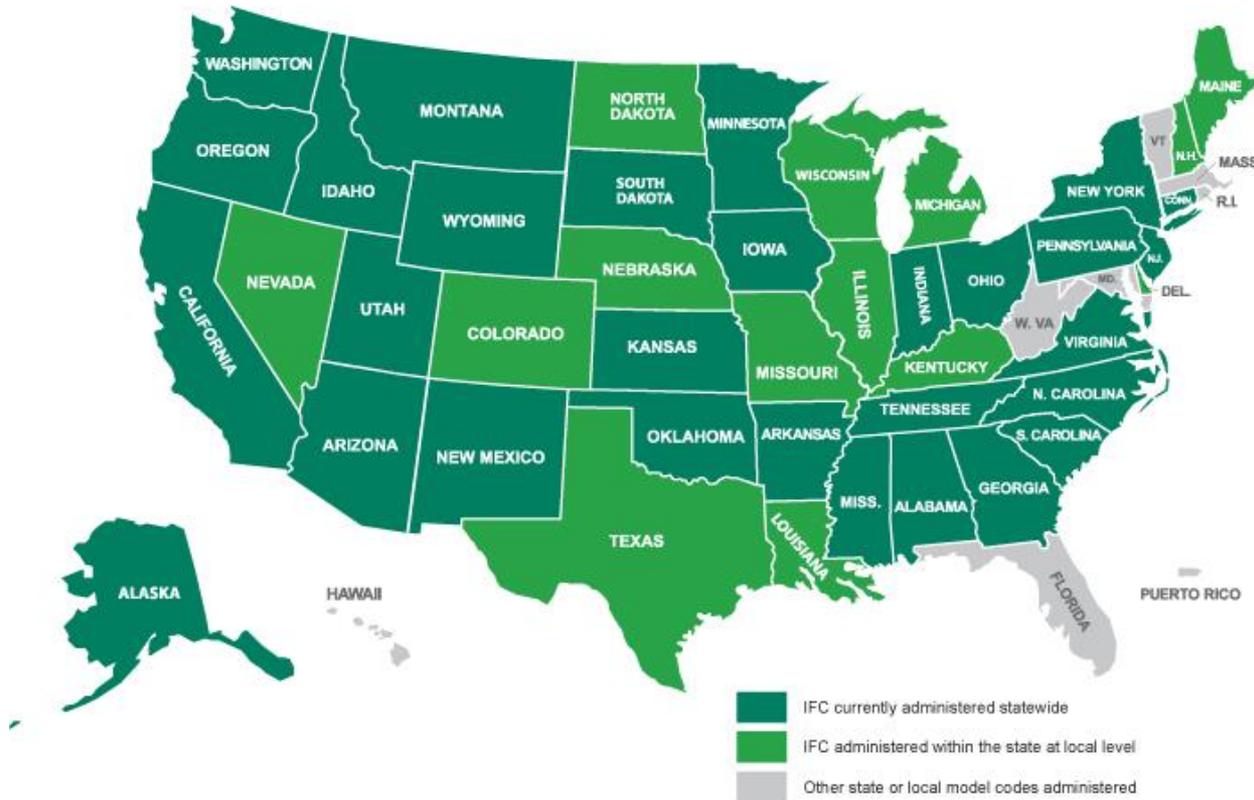
Applicability

- DOE sites!
- Many other federal government sites
- NFPA 1 States (non federal land)

IFC States

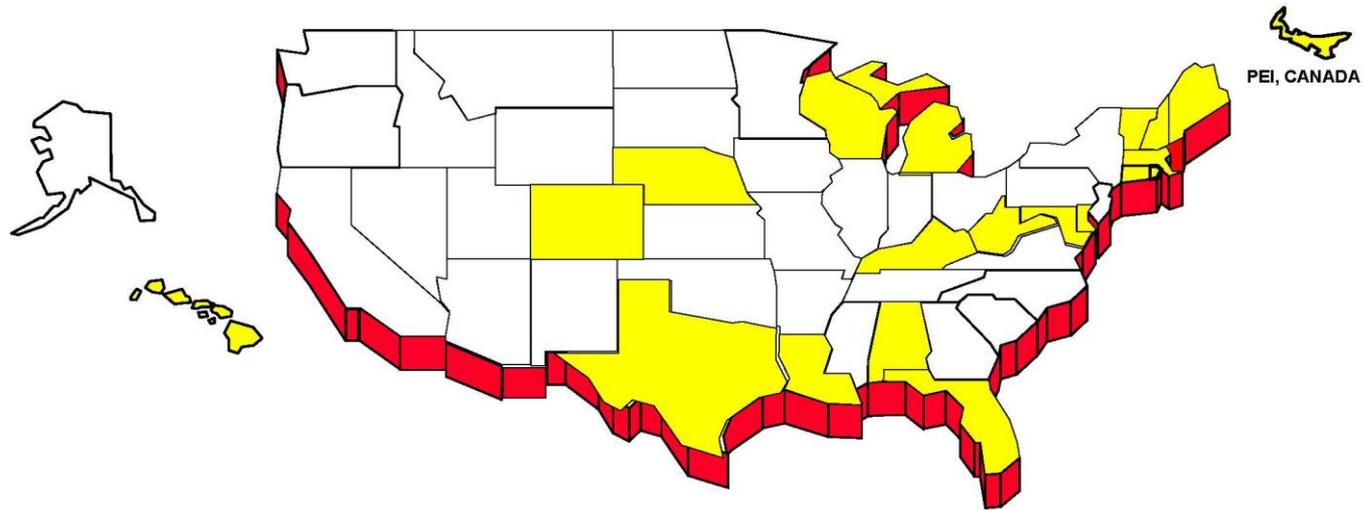
INTERNATIONAL FIRE CODE ADOPTION MAP

The IFC is in use or adopted in 43 states, the District of Columbia and NYC.



NFPA 1 States

NFPA 1 FIRE CODE ADOPTIONS APRIL 2013



**19 STATEWIDE NFPA 1 ADOPTIONS
US NAVY IN THE PROCESS OF ADOPTING
1 PROVINCE ADOPTION**

NFPA 400

Current Edition

- 2013 Edition
 - MAQ tables slightly revised . Coordinate with:
 - IBC/IFC
 - NFPA 55 Gases, Cryogenics
 - Oxidizer Definitions Revised
 - Qualitative definitions retained in Ch. 3
 - Quantitative parameters introduced in Annex A & G.
 - Oxidizer Table in Annex G revised and test method introduced.

NFPA 400 Scope

IFC/IBC HAZMAT Classification	NFPA HAZMAT Classification	NFPA Document
Physical Hazards		
Explosives Blasting Agents	Not in Scope NO MAQ	NFPA 495
Combustible Liquids	Not in Scope NO MAQ	NFPA 30
Flammable solids, liquids and gases	Flammable Solids, Flammable gases	NFPA 400 NFPA 55, NFPA 58 LPG
Organic Peroxide solids or liquids	Organic peroxide formulations	NFPA 400
Oxidizer, solids or liquids	Oxidizer solids or liquids	NFPA 400
Oxidizing gases	Oxidizing gases	NFPA 55
Pyrophoric solids, liquids or gases	Pyrophoric solids and liquids or gases	NFPA 400
	Pyrophoric gases	NFPA 55
Unstable (reactive) solids, liquids, or gases	Unstable(reactive) solids or gases	NFPA 400
	Unstable(reactive) gases	NFPA 55
Water-reactive materials solids or liquids	Water-reactive solids or liquids	NFPA 400
Cryogenic fluids	Flammable cryogenic fluids	NFPA 55
	Inert cryogenic fluids (No requirements)	Not hazardous.
	Oxidizing cryogenic fluids	NFPA 55
Health hazards		
Highly toxic and toxic materials	Toxic or highly toxic solids or liquids	NFPA 400
	Toxic or highly toxic gases	NFPA 55
Corrosive materials	Corrosive solids and liquids	NFPA 400
	Corrosive gases	
	Inert gases (no MAQ)	Not hazardous
Ammonium nitrate per NFPA 490 & Ch 40 Oxidizers	Ammonium Nitrate solids & Liquids	400 (Ch 11)

How NFPA 400 works!

- Step 1 Categorize (Ch. 4)
- Step 2 Quantity, phase and location
- Step 3 <MAQ (Apply control area concept) (Ch. 5)
- Step 4 >MAQ (Ch. 6 + Ch. X)
- Step 5 Determine Protection Level (1-5)
- Step 6 Apply requirements of **hazard** specific Chapter (Ch. 11-21)
- Step 7 – There is no step 7. Repeat 6 as needed.

Current Issues

- Waste Handling Facilities
 - Clarify requirements
 - Research Foundation Project
- Separation Distances
 - Establish basis
 - Research Foundation Project
- Oxidizers
- PL-4 (H-4) Egress (no common path)
- Ammonium Nitrate

Ammonium Nitrate

- NFPA 400 is the ONLY document for the entire US.
- AN is Treated Different from all other Hazardous Material
- Material Specific Chapter
- Not a Hazard Specific Chapter

Classify AN
per Ch 4

Determine MAQ
per Table 5.2.1.13

<MAQ
Apply Ch 1-4
+
Applicable
requirements of
Ch 5-10

>MAQ
Apply Ch 1-4
+
Applicable requirements
of Ch 5-10
+
Chapter 11

None of Oxidizer or UR
Chapters

AN Storage Methods - Bags



AN Storage Methods – Bulk



Review of Loss History



West TX, Before



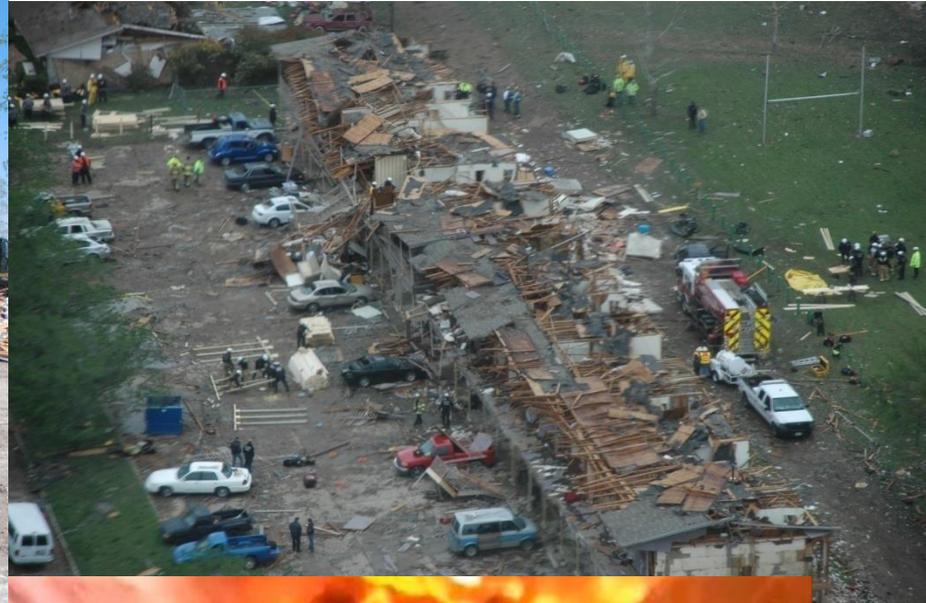
West TX - After



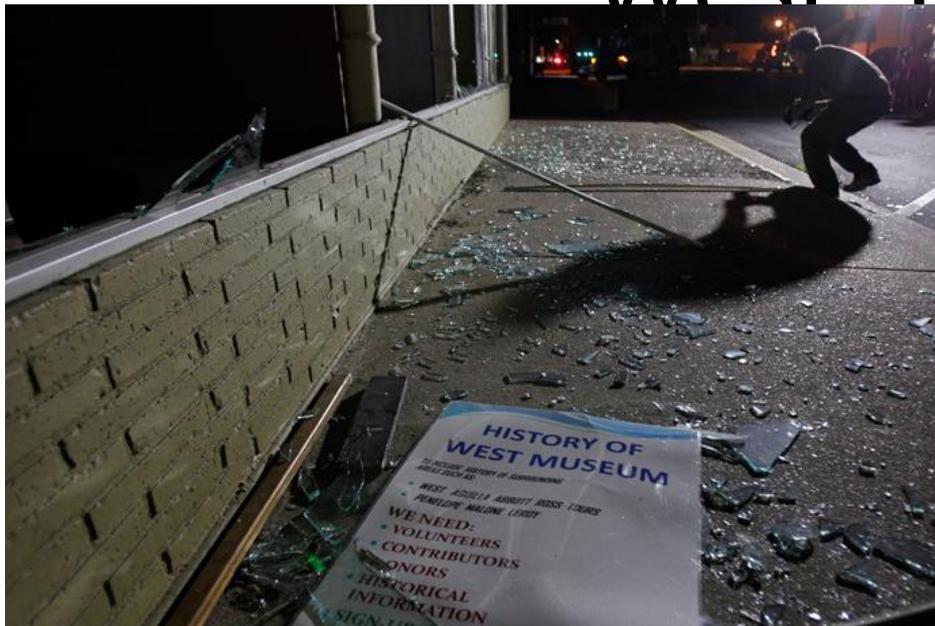
West TX - After



West. TX - After



West TX - After



AN Explosion Images – Not WEST



NFPA 400 Ch 11 AN (2013)

- Applies >MAQ (5 lbs for UR3 det, 250 lbs OX 3)
- Existing Conflicts that need improvement
 - Applicability >MAQ or % ammonium nitrate (annex E)
 - Sprinkler requirement. >MAQ per 11.2.6 or >2500 tons in bags per 11.2.6.1.1.
 - AHJ decisions or prescriptive requirements?
 - Outdoor storage? Nearly no requirements 11.4

NFPA 400 Proposed Changes

- Delete conflicting thresholds 50 tons or 5 lbs?
- Require sprinklers retroactively
- Require fire alarm retroactively.
 - Flow switch
 - Building notification
- Require Evacuation Plan and community siren if >1000 lbs and UR3 det.
- Heat detection for outdoor hoppers

Conclusions

- NFPA 400 Status
 - Public comment is welcome
 - Committee does not write the code – **the public does**
 - Deadline for input:
 - Paper: 4/11/2014
 - Electronic: 5/16/2014

Conclusions

