NFPA 400
Hazardous Materials Update

May 6, 2014
Martin T Gresho, PE
Alexis Park Hotel, Las Vegas, NV
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  – Withdrawn Documents (absorbed in 400)
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.

IFC currently administered statewide
IFC administered within the state at local level
Other state or local model codes administered

Code adoptions as of 04/2010.
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, Cryogens
  – 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.
<table>
<thead>
<tr>
<th>IFC/IBC HAZMAT Classification</th>
<th>NFPA HAZMAT Classification</th>
<th>NFPA Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Hazards</td>
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</tr>
<tr>
<td>Explosives Blasting Agents</td>
<td>Not in Scope NO MAQ</td>
<td>NFPA 495</td>
</tr>
<tr>
<td>Combustible Liquids</td>
<td>Not in Scope NO MAQ</td>
<td>NFPA 30</td>
</tr>
<tr>
<td>Flammable solids, liquids and gases</td>
<td>Flammable solids,</td>
<td>NFPA 400</td>
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<td>Flammable gases</td>
<td>NFPA 55, NFPA 58 LPG</td>
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<tr>
<td>Organic Peroxide solids or liquids</td>
<td>Organic peroxide formulations</td>
<td>NFPA 400</td>
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<tr>
<td>Oxidizer, solids or liquids</td>
<td>Oxidizer solids or liquids</td>
<td>NFPA 400</td>
</tr>
<tr>
<td>Oxidizing gases</td>
<td>Oxidizing gases</td>
<td>NFPA 55</td>
</tr>
<tr>
<td>Pyrophoric solids, liquids or gases</td>
<td>Pyrophoric solids and liquids or gases</td>
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<td></td>
<td>Pyrophoric gases</td>
<td>NFPA 55</td>
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<td>Unstable (reactive) solids, liquids, or gases</td>
<td>Unstable(reactive) solids or gases</td>
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</tr>
<tr>
<td>Water-reactive materials solids or liquids</td>
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<tr>
<td>Cryogenic fluids</td>
<td>Flammable cryogenic fluids</td>
<td>NFPA 55</td>
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<tr>
<td></td>
<td>Inert cryogenic fluids (No requirements)</td>
<td>Not hazardous.</td>
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<tr>
<td></td>
<td>Oxidizing cryogenic fluids</td>
<td>NFPA 55</td>
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<tr>
<td>Health hazards</td>
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<td>Highly toxic and toxic materials</td>
<td>Toxic or highly toxic solids or liquids</td>
<td>NFPA 400</td>
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<tr>
<td>Corrosive materials</td>
<td>Toxic or highly toxic gases</td>
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<td></td>
<td>Corrosive solids and liquids</td>
<td>NFPA 400</td>
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<tr>
<td></td>
<td>Corrosive gases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inert gases (no MAQ)</td>
<td>Not hazardous</td>
</tr>
<tr>
<td>Ammonium nitrate per NFPA 490 &amp; Ch 40 Oxidizers</td>
<td>Ammonium Nitrate solids &amp; Liquids</td>
<td>400 (Ch 11)</td>
</tr>
</tbody>
</table>
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
• QUESTIONS?

• Thank You!!