• **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  – Withdrawn Documents (absorbed in 400)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 400 Update - Gresho
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.
### NFPA 400 Scope

<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>
<td></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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<tr>
<td></td>
<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>
</tr>
<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>
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<td>Pyrophoric solids and liquids or gases</td>
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<td>Water-reactive materials solids or liquids</td>
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<td>Flammable cryogenic fluids</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>
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<tr>
<td>Health hazards</td>
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<tr>
<td>Highly toxic and toxic materials</td>
<td>Toxic or highly toxic solids or liquids</td>
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<tr>
<td></td>
<td>Toxic or highly toxic gases</td>
<td>NFPA 55</td>
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<td>Corrosive materials</td>
<td>Corrosive solids and liquids</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>
</tbody>
</table>

| Ammonium nitrate per NFPA 490 & Ch 40 Oxidizers | Ammonium Nitrate solids & Liquids | 400(Ch 11) |

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NFPA 400 Update - Gresho
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
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!!