An Overview of NFPA's Hydrogen Requirements

National Hydrogen Association Meeting
April 28, 2004

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NFPA Contact Information

- For more information contact on NFPA's hydrogen activities
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NFPA- What it is and does

- Non-profit association founded in 1896
- Provides full range of fire and safety programs
- Develops codes & standards - volunteer based
- 75,000 Members & 300+ Staff
- 220+ Committees
- 300+ Codes & Standards
- www.nfpa.org
- www.nfpa.org/ECommittee/HCGroup/HCGroup.asp

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The NFPA Process

- Revision process closely mirrors regulatory revision process
- Call for proposals
- Committee review of proposals
- Report on Proposals published
- Call for Comments/committee review
- Vote by NFPA membership
- Issuance by NFPA Standards Council

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Existing NFPA H_2 Codes and Standards

1. *NFPA 50A Standard for Gaseous Hydrogen Systems at Consumer Sites 1999 Edition*
2. *NFPA 50B Standard for Liquefied Hydrogen Systems at Consumer Sites 1999 Edition*
3. *NFPA 853 Stationary Fuel Cell Power Plants 2003 Edition*
4. *NFPA 70 National Electric Code®Article 692 2002 Edition*

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Projects Underway to Expand Hydrogen Requirements

- Expansion of NFPA 52 Compressed Natural Gas (CNG) Vehicular Fuel Systems Code 2002 Edition to cover Hydrogen.
- *Modifications to NFPA 55 Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks 2003 Edition* to address hydrogen systems

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Vehicular Alternative Fuels T/C

- Primary responsibility for documents on fire and explosion hazards associated with compressed natural gas (CNG), gaseous hydrogen (GH2, liquefied hydrogen LH2, and liquefied natural gas (LNG) engine fuel systems on vehicles of all types and for refueling stations and associated storage.
- Responsible for NFPA 52 and 57

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Recent Code and Standard Activities- NFPA 52 2005 ed.

- *NFPA's Vehicular Alternative Fuel Systems met in March 2004 to develop requirement for hydrogen refueling operations*
- *Committee also incorporating NFPA 57 (LNG refueling and engine systems) into 2005 edition of NFPA 52*
- *Draft of 2005 ed of NFPA 52 issued 8/1/2004*
- *Committee will meet Nov. 2-5, 2004 to review comments to draft NFPA 52*

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Industrial and Medical Gases T/C

- Committee Scope: primary responsibility for documents on the storage, transfer, and use of industrial gases. Included are the storage and handling of such gases in their gaseous or liquid phases; the installation of associated storage, piping, and distribution equipment; and operating practices.
- Responsible for NFPA 50, 50A, 50B, 51, 51A, 55 and 560

Recent Code and Standard Activities- NFPA 55 2005 ed.

- *NFPA's Industrial and Medical Gas Technical Committee met in August 2003 to review proposals to NFPA 55*
- *Committee proceeding to incorporate NFPA 50A and 50B into 2004 edition of document*
- *Committee will meet June 8-10, 2004 to review comments on the Draft 2005 edition of NFPA 55*

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Electric Generating Plant T/C

- primary responsibility for documents on fire protection for electric generating plants and high voltage direct current (HVDC) converter stations, except for electric generating plants using nuclear fuel.
- Responsible for NFPA 850, 851 and 853

Recent Code and Standard Activities- NFPA 853 2003 ed.

- *2003 edition of 853 just released*
- *Covers all size stationary fuel cells- previous edition did not cover smaller systems*
- *Refers to NFPA 55 for storage of hydrogen used for fuel cell systems*

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Building Construction and Safety Code T/C

- Primary responsibility for documents or portions of documents on the design and construction of every building or structure, including structural design methods and techniques, as well as the design of integrated building systems for health, safety, comfort, and convenience.
- Responsible for NFPA 5000

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Recent Code and Standard Activities- NFPA 5000 2006 ed.

- *NFPA Building Construction and Safety Code contains references to NFPA 55, 853, and 52 among other hydrogen documents*
- *Proposals to next edition being balloted*
- *Comment closing date 10/8/2004*

Fire Prevention Code T/C

- Primary responsibility for documents on a Fire Prevention Code that includes appropriate administrative provisions, to be used with the National Fire Codes for the installation, operation, and maintenance of buildings, structures and premises for the purpose of providing safety to life and property from fire and explosion.
- Responsible for NFPA 1Uniform Fire Code™

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Recent Code and Standard Activities- NFPA 1 2006 ed.

- *NFPA 1- now called the Uniform Fire Code*
- *Fire prevention code meant to work in tandem with NFPA 5000 Building Code*
- *Give code official a single document for fire safety compliance inspections*
- *For the most part NFPA 1 extracts material from other NFPA document- large portions of NFPA 55 extracted into NFPA 1*

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The NFPA Hydrogen Coordinating Group (HCG)

- Compare the existing NFPA hydrogen safety requirements to the needs of the hydrogen infrastructure and determine where there are gaps.
- Form work groups to develop the needed requirements

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The NFPA Hydrogen Coordinating Group (HCG)

- Formed December 2002 with following task groups:
- 1.Metal Hydride Storage and Generation
- 2. High Pressure Storage/Composite Material for Storage/High Pressure Handling and Utilization)
- 3.Hydrogen Siting (including electrical classification, rooftop siting, and offset distances)
- 4.Below Grade and Mounded Storage
- 5. Emergency Power generation

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The NFPA Hydrogen Coordinating Group (HCG)

- 6. C^3® Code Set
- 7. Methanol Usage
- 8. Hydrogen Venting (Size and Location of Vents)
- 9. Hydrogen Piping and Utilization (including building ventilation)
- 10. Hydrogen Detection and Protection (Sensing and Control Devices)

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Potentially Affected Documents

- *1. NFPA 55 Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks*
- *2. NFPA 52 Vehicular Fuel Systems Code*
- *3. NFPA 30A Code for Motor Fuel Dispensing Facilities and Repair Garages*
- *4. NFPA 853 Stationary Fuel Cell Power Plants*
- *5. NFPA 5000™ Building Construction and Safety Code*

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Potentially Affected Documents

- *6. NFPA 497 Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*
- *7. NFPA 70 National Electric Code®Article 692*
- *8. NFPA 110 Standard for Emergency and Standby Power Systems*
- *9. NFPA 111 Standard on Stored Electrical Energy Emergency and Standby Power Systems*

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The Future

- NFPA would like to see the views of all interested parties heard and encourages them to participate in the process of creating hydrogen safety requirements in the NFPA codes and standards
- For more information contact
- Carl Rivkin, P.E

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