

ASME HYDROGEN CODES & STANDARDS

New Activities Update

**Fuel Cells Summit VII
University of Maryland
May 28, 2003**

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Summary

- ◆ H₂ Steering Committee Activity
- ◆ H₂ Standards Task Forces
- ◆ H₂ Standards Development Steps
- ◆ Interface with Other Organizations
- ◆ Spreading the Word
- ◆ Invitation to Participate

ASME H₂ Steering Committee

- ◆ Formed in November 2002
- ◆ Volunteer membership from industry, academia, and government organizations
- ◆ Committee charge includes:
 - Identifying ASME codes and standards for H₂ infrastructure applications
 - Coordinating with standards developers
 - Involvement in related global regulations

ASME H₂ Steering Committee

- ◆ Revised Action Plan from January 13, 2003 workshop
- ◆ Considering established ASME standards applicable for H₂ applications
- ◆ Proposed initial H₂ standards actions:
 - Piping and Pipelines Standard (Items 1,2,17)
 - Portable Tank Standard (Item 11)
 - Storage and Transport Tank Standard (Items 12,13)

ASME Codes and Standards Applicable to H₂ Infrastructure

◆ Tanks:

- BPVC Section VIII
 - Division 1 – Pressure Vessels
 - Division 2 – Alternative Rules
 - Division 3 – High Pressure Vessels
- Code Case 2390 - BPVC Section VIII, Div.3 - Composite Reinforced Pressure Vessels
- BPVC Section X - Fiber-Reinforced Plastic Pressure Vessels
- BPVC Section XII - Rules for Construction of Transport Tanks (1st edition in 2003)

ASME Codes and Standards Applicable to H₂ Infrastructure

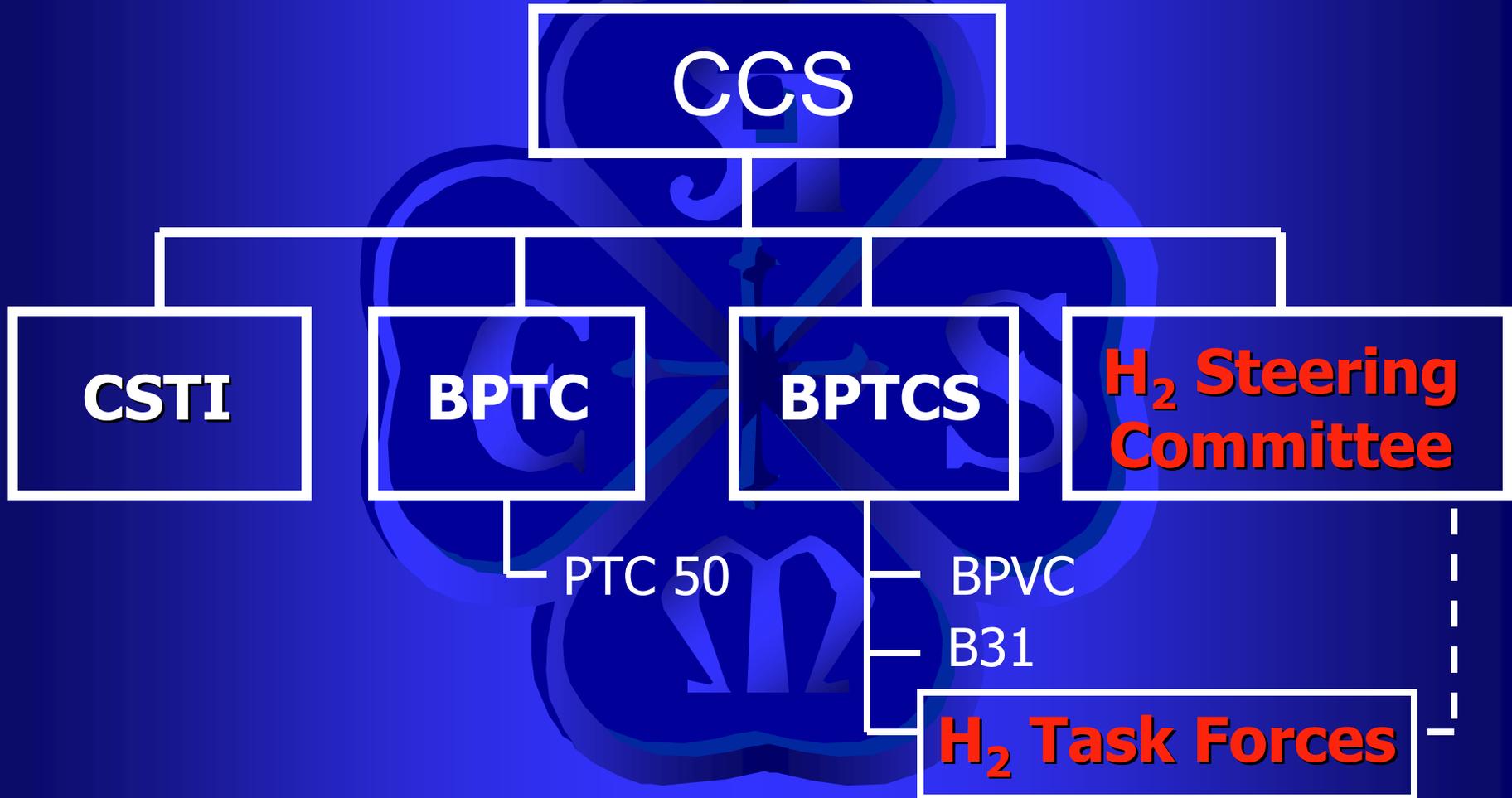
◆ Piping and Pipelines:

- B31.1 - Power Piping
- B31.3 - Process Piping
- B31.8 - Gas pipelines
- B31.8S - Managing gas pipeline integrity

◆ Fuel Cells:

- PTC 50 - Performance Test Code on Fuel Cell Power Systems Performance

ASME H₂ Standards Organization



ASME H₂ Task Forces

- ◆ ASME Board on Pressure Technology Codes & Standards (BPTCS) formed H₂ Task Forces
 - H₂ Piping and Pipelines
 - Small Portable H₂ Tanks
 - H₂ Storage and Transport Tanks
- ◆ Task Force Charges include:
 - Gather and review information
 - Understand regulatory issues
 - Understand industry users
 - Determine scope of standardization
 - Identify research needs
 - Make recommendations to BPTCS

ASME H₂ Task Forces

◆ Anticipated Direction

- Obtain broadest possible input to scoping
- Fill gaps for H₂ infrastructure
- Heavily reference existing standards
- Guidance to designers, fabricators, and users on special H₂ considerations
- Recommendations may include:
 - Expand existing standards
 - Develop new standards
 - No action in some cases
- Task Forces will not write the standards

Task Force on H₂ Piping and Pipelines

- ◆ Address requirements for piping and pipelines in H₂ service
 - Metallic and composite materials
 - All pressure ranges
 - Industrial, commercial, and residential applications
 - Potential references – B31.1, B31.3, B31.8, CGA 5.4, NFPA 54
- ◆ First teleconference - May 15, 2003
- ◆ Staff Contact: koehrj@asme.org

Task Force on Small Portable H₂ Tanks

- ◆ Address requirements for small portable tanks in H₂ service
 - Metallic and composite materials
 - Gas, liquid, and metal hydrides
 - Up to 5,000 psi
 - < 5 kg capacity
 - Portable applications
 - Potential references – BPVC Section VIII, X, SAE
- ◆ Has not yet met
- ◆ Staff Contact: eisenbergg@asme.org

Task Force on H₂ Storage and Transport Tanks

- ◆ Address requirements for H₂ storage and transport tanks
 - Metallic and composite materials
 - Gas, liquid, and metal hydride
 - Up to 10,000 psi
 - > 5 kg capacity
 - Industrial, commercial, and residential applications
 - Tube trailers
 - Potential references – BPVC Section VIII, X, API 620, API 650
- ◆ First Teleconference – May 19, 2003
- ◆ Staff Contact: eisenbergg@asme.org

Research and Development

- ◆ To be identified by H₂ Task Forces
- ◆ Managed by Codes & Standards Technology Institute (CSTI)
 - Provides R&D needed for technical relevance of C&S
 - Manages C&S research projects
 - Outside of the consensus process
 - Volunteer committees may be formed to validate research
 - <http://www.csti.asme.org>

Interface With Other Organizations

- ◆ DOE Harmonization Meeting - March 7, 2003
 - Lead SDOs assigned
 - Fuel Delivery and Storage
 - Composite Containers - ASME, CSA, CGA, NFPA
 - Pipelines - ASME, API, CGA, AGA
 - Equipment – ASME, API, CGA, AGA
 - Fueling and Service
 - Storage Tanks - ASME, CSA, CGA, NFPA, API
 - Piping - ASME, CSA, CGA, NFPA
- ◆ ASME interface with other SDOs will be through the H₂ Steering Committee
 - Contact: koehrj@asme.org

Interface With Other Organizations

- ◆ Member of DOE H₂ C&S Coordinating Committee (HCSCC)
- ◆ Jurisdictions and Regulatory
 - National Board of Boiler Inspectors (NBBI)
 - Jurisdictional Chief Inspectors
 - Responsible for enforcement of laws
 - 49 US States
 - Some U.S. municipalities
 - All Canadian Provinces
 - ASME Conference Committee
 - Includes NBBI membership
 - First consideration vote of BPVC standards actions

Interface With Other Organizations

◆ International

- **ASME C&S International Presence**
 - BPVC accepted in over 80 countries
 - 1,600 accredited manufacturers outside of U.S.
- **ISO Technical Advisory Group (TAG) Participation**
 - ASME administers 47 U.S. TAGs
 - Administers ISO/TC11 (B&PV) U.S. TAG
 - Member of ISO/TC 197 (Hydrogen) U.S. TAG
- **Pressure Technology Sectoral Technical Advisory Committee (PT-STAC)**
 - Advise U.S. DOC and USTR on pressure equipment issues

Interface With Other Organizations

◆ Approach for International Standards

- Multiple paths to international standardization
- ASME is one of those paths, ISO is another
- ASME supports development of technically sound and globally relevant international standards
- Example: ASME B31.3 Process Piping is an international standard

H₂ Standards Development Steps

- ◆ H₂ Task Force recommendation
- ◆ BPTCS Initiates Standards Action
- ◆ Prerequisite technical work, R&D
- ◆ Draft standard
- ◆ Standards Committee approval
- ◆ Public review
- ◆ Supervisory Board approval
- ◆ ANSI approval

Spreading the Word

- ◆ ASME Workshop – January 13, 2003
- ◆ CCEF Fuel Cell Summit – March 17, 2003
- ◆ ASME Fuel Cell Conference – April 22, 2003
- ◆ ASME Conference Committee – April 29, 2003
- ◆ ASME News – monthly
- ◆ C&S Newsletter – quarterly
- ◆ www.asme.org

Invitation to Participate

- ◆ Membership on H₂ Task Forces
- ◆ Serve as technical resource to H₂ Task Forces
- ◆ Participate on future voluntary consensus standards committees
- ◆ Staff Contact: eisenbergg@asme.org