

Hydrogen Industry Panel on Codes

Tentative Teleconference Agenda

October 24, 2006

11:00AM – 1:00PM EDT

1. Welcome, Introductions

11:07am (EST) HIPOC quorum is present (5 of 9). Call likely limited to 1:00p.

Attendees (21):

serfassp@hydrogenassociation.org; tmusil@jadoopower.com; dpfeil@cellexpower.com;
rodys@earthlink.net; larry.moulthrop@protonenergy.com; crivkin@NFPA.org;
tholmes@nuvera.com; gregory.milewski@shell.com; Ichilada@arb.ca.gov; bdeal@arb.ca.gov;
ZAJACA@michigan.gov; nancy.pehrson@centerpointenergy.com; khall@ttcorp.com;
joseph@airproducts.com; jim_ohi@nrel.gov; Michael.Short@UTCPower.com;
Glenn.Scheffler@UTCPower.com; Russell.Hewett@nrel.gov; connie.bielawski@csa-america.org;
Julie.Cairns@CSA-America.org; dmeyers@iccsafe.org

2. Proposals/Issues for consideration for NFPA 52

a. Hydrogen/Natural Gas Blends

Hank Seiff¹ (representing CSA's NGV2 Technical Advisory Group Vehicular CNG Cylinders):

“We request a TIA to NFPA 52 so that it no longer infers that vehicular fuel systems designed for CNG can be used with blends up to 20% hydrogen. The NGV2 TAG simply does not have data showing materials in NGV2 cylinders are safe for use with levels of hydrogen higher than 2%.” See attached files below:

“2% H2 TIA No 1”

“2% H2 TIA No 2”

DISCUSSION:

CSA’s Julie Cairns (for CVEF’s Hank Seiff) – Is Hank confident that TIA No. 1 covers potential conflicts throughout 52? Carl Rivkin – Led discussion relative to comments in opposition to TIA No. 1 from 52 Members. Tom Joseph – Should a note or a warning need be inserted throughout 52 to address the “up to 2%” concept? Julie Cairns – Pointed out that it appears 52 precludes “blends” beyond 20% H2 otherwise, the cylinders and appurtenances to NGV’s would have to be researched. It was unclear whether the scope of 52 covered blends up to 20% H2. Rody Stephenson – ASME and others in industry would not support blends of more than 5% H2 in natural gas.

ACTION – CVEF’s Hank Seiff (via CSA’s Julie Cairns) – Are there greater safety concerns now at 20% by volume for H2 in natural gas compared to the proposed de-limited scope of NFPA 52 – Reducing 20% by volume for H2 in natural gas down to 2% H2 blends? If so, the proponent (CVEF) should revisit the affected “natural gas” sections completely.

¹ Unable to attend the teleconference

ACTION – CVEF’s Hank Seiff (via CSA’s Julie Cairns) – Please confirm and report on availability of HGV2 by September, 2007?

b. Sandy Thomas (representing H2Gen Innovations).

DISCUSSION:

HIPOC asks that H2Gen, Sandy or other strategic partner present a written proposal to review and be present on the November 20th, 2006 call to discuss the specifics.

Two missing pieces:

i. **On-site hydrogen generators** (“mentioned here and there, but no details”)

DISCUSSION:

ACTION Proton Energy’s Larry Mouthrop to coordinate w/ H2Gen’s Sandy Thomas and UTC Power’s Mike Short. MS – It would be appropriate to reference FC1, NFPA 853, FC3 and UL 2264 (*Not likely available until late 2007*) Parts A, Water electrolyzers, and B, Reformers. LM – UL 2264 A/B are planned to be nationalized versions of ISO 22734 and ISO 16110. References to source of H2 supply should uniformly include the phraseology “on-site generation.” The term is inclusive of reforming and water electrolysis methodologies.

ii. **Elevated compressed hydrogen tanks** either on building roofs or canopy roofs over the fueling station.

DISCUSSION:

ACTION Shell Hydrogen’s Greg Milewski to coordinate w/ Sandy Thomas – A real concern is retrofitting existing service stations for hydrogen use. Should HIPOC look into the development of a notation in the annex to NFPA 52 to clarify the meaning of ‘appropriately engineered’ in §9.3.2.3 – OR – contemplate harmonization of §9.3.2.3 with Canopy Top provisions in ICC IFC §2209.3.2.6 Canopy Tops – OR – Should HIPOC pursue NFPA for a technical interpretation of the meaning and applicability of §9.3.2.3?

c. **Interface between the vehicle and building**

Rody Stephenson²:

DISCUSSION:

Rody Stephenson – ICC and NFPA seem to focus on the built environment; CSA and SAE seem to focus on the vehicle. The PRD must be more reliable. Will there be research to support? Jim Ohi – This is an area DOE intends to support. Are there specific recommendations?

To the best of my knowledge the interface between the vehicle and the building has fallen between the cracks. The most obvious example of this is the situation when a vehicle is parked in a residential or commercial parking garage.

A full range automobile will have ca 5-6 kg of H2 on board. There is a point of single point failure which is the thermally-actuated pressure relief device (PRD) on the vehicle. Its flow rate will be sized to vent the contents of the vehicle in a few minutes (say 3 minutes). If that PRD should inadvertently open while the car is parked inside we will end up with a

² Will call in 30 minutes late

hydrogen flow rate of ca 2 kg/min - a huge rate. Delayed ignition is quite possible in such a situation and could lead to a serious explosion.

The solution to that is to make the PRD extremely reliable. When the H2 economy is mature there may be 200 million H2 vehicles on the road. If society will tolerate 2 such H2 explosions per year, you can easily see that the PRD reliability (for an "open" failure) needs to be no more than 10⁻⁸ per year.

I am an advocate of quantitative risk analysis and I think someone has to step up and specify the PRD reliability requirements.

HIPOC's opinion is that this is a component standard issue for SDO's like CSA and SAE to address at the component level. The PRD reliability issue is not something the Code Development Organizations will solve.

3. **Other items.**

Nuvera's Thomas Holmes – **UL 2267 and the refueling of industrial trucks within buildings.** Tom Joseph – There is a proposal currently in the ICC Process (F155-06/07) that was recommended for Disapproval by the IFC Committee. HIPOC would ask for your support. For more information see www.

UTC Power's Mike Short – **Areas of the repair garage that are intended specifically for maintenance of hydrogen-fueled vehicles.**

Shell Hydrogen's Greg Milewski – **Should we clarify NFPA §9.2.10 regarding phraseology, "high discharge" and "low suction pressure?"**

Air Products' Tom Joseph – fyi... **CGA proposing changes to NFPA 52.** If there's interest in collaborating on these sections, please contact Tom directly.

§9.2.15

§9.2.2

§9.2.2.3

§9.3.1.2

§9.2.15.2

§9.2.2.2

§9.2.16

ACTION Michigan Dept. of Environmental Quality's Andrea Zajac – Was asked to investigate **areas within the Michigan Hydrogen Code that may be of interest to the HIPOC for consideration at the November 20, 2006 meeting.**

4. Next Meeting

Tom Joseph – This group, HIPOC and parties interested in NFPA 52 should meet again prior to the NFPA 52 proposal deadline of November 23rd, 2006.

NEXT MEETING: November 20, 2006, 1pm – 4pm (EDT). Proposals to be considered by the HIPOC on 11/20/2006 shall be in accordance with NFPA procedures, on NFPA proposal forms, and ready for "prime time" DUE TO HIPOC staff via crivkin@NFPA.org ON OR

BEFORE C.O.B., NOVEMBER 15, 2006. NFPA submittal procedures can be found at:
<http://www.hydrogenandfuelcellsafety.info/hipoc/proposals.asp>

For a copy of the minutes or more information on composition of the HIPOC, the HIPOC charter and related information, please visit the HIPOC web page:
<http://www.hydrogenandfuelcellsafety.info/hipoc/>

5. Adjourn 12:50pm (EDT)