

**National Hydrogen and Fuel Cell Codes and Standards Coordinating Committee
(NHFCSCC)**

**Wednesday, November 20, 2019
TIME: 3:00 – 4:00 pm (Eastern Standard Time)**

Minutes

Attendees

**Christina Daniels
Connor Dolan
Eric Prause
Greg Chirdon
Ian MacIntire
Jay Keller
Jennifer Gangi
Jennifer Hamilton**

**John Eihusen
Juana Williams
Justin Lewis
Karen Quackenbush
Kelvin Hecht
Laura Hill
Mark Duda
Mark Richards**

**Mike Steele
Morry Markowitz
Ray Rahaman
Rob Early
Sara Marxen
Yuk Wong**

I. Welcome and Housekeeping Items

- Reviewed FCHEA's anti-trust guidelines - Available on FCHEA's members only website and a copy can be provided to you on request.
- Approved the meeting agenda
- Approved the previous meeting minutes

II. DOE/HQ Update

Laura Hill

The federal government is under a continuing resolution that ends this week. We do not have any more information on that at this time.

The IPHE Steering Committee met in Korea. There is a large emphasis in that group on RCS harmonization and gas identification. We appreciate all of your hard work.

The Department of Energy also hosted an H2@Scale Workshop as part of the Fuel Cell Seminar earlier this month which was very well attended.

III. Codes & Standards Events and Fuel Cell Safety Information

<http://www.hydrogenandfuelcellsafety.info/events/>

Karen Quackenbush

Request: technical resource updates for the Hydrogen and Fuel Cell Safety website. Any committee members who have materials they would like hosted on the website can send them to Karen Quackenbush (khall@fchea.org) or Connor Dolan (cdolan@fchea.org).

IV. Global Technical Regulations

Ian MacIntire

Ian MacIntire – attended the GTR 13 meeting Phase 2 in Stuttgart. This was a several day meeting. Changes and comments on the test procedures were reviewed on Monday by Task Force 3. Many of these issues were resolved, some are still pending. There was a risk

assessment done by Shell and Air Liquide on risk associated with hydrogen fueling and performance tests. We discussed possibilities of drop test in GTR 13 which is a bit confusing, no consensus was reached. There were proposed changes to the TPRD test procedures in GTR 13 and NHTSA had some comments that were discussed, this issue is still pending.

Task Force 1 on Tuesday had the objective of expanding GTR 13 to cover heavy-duty vehicles. One of the major topics discussed was the TPRD venting direction for Heavy-duty vehicles proposed by NHTSA, comments were received by Nikola and others. This was edited by the task force and sent for consideration. Other items were agreement to extend service life to fuel cell vehicles to 25 years. Need to understand the number of fuelings needed for that kind of service life expanded from 15 years.

Variability of the fire testing and expanding to cover heavy duty vehicles. JARI showed a comparison between different burner configurations. They are still collecting data on different methods to use and are getting close to an actual test procedure that can be edited and reviewed.

The informal working group meeting on Wednesday and Thursday had all contracting parties present. This group addressed issues that were relating to the task force. This included a sled test for heavy-duty vehicles in place of a crash test as you can not do a crash test for HDVs. A sled test of just the hydrogen container and its mountings is only really testing the mountings of the container when it is new and not an important safety need. There was discussion on whether this should be included or not.

Task Force 1 was able to agree and accept the same hydrogen leakage limits as heavy vehicles as for light vehicles.

Task Force 2 held a discussion on whether or not the need to include standardization of the hydrogen refueling receptacle based on an ISO standard. The benefit of doing that would be to harmonize hydrogen refueling and to prevent 35 MPa vehicles from being fueled with 70 MPa fuelings. There was discussion on whether there is current standardization or if these receptacles are still being developed further.

Another lively topic pertained to material compatibility and whether adding test procedures to test materials to containers and components that things were made out of, to determine if these pieces would be degraded by interaction with hydrogen. It did not seem that there was strong support outside of Japan to add materials requirements. NHTSA felt it was better left to industry to make these decisions, but discussion is still ongoing.

Discussions also continued on the minimum burst pressure requirement from a hydrogen container. The minimum is currently set at 225% of the normal working pressure of the container. There was some push to change that to 200% pressure of the container based on other requirements on end of life, degradation limit, etc. Most countries agreed to lower this burst pressure requirement, except for China that agreed only for 70 MPa containers and not 35 MPa. This will be discussed at the next meeting in Japan in March.

Jay Keller – GTR Phase 2 is largely for medium and heavy-duty vehicles. This brings to the table a lot of things that Phase 1 did not consider as it was only focused on light-duty vehicles. There are a couple of issues left over from GTR 1 that we are working to clean up such as the fire test.

V. Codes and Standards Organization Updates

International Electrotechnical Commission IEC TC 105

Kelvin Hecht

No report at this time.

International Standards Organization ISO/TC 197

Karen Quackenbush/Jay Keller

Jay Keller – The plenary is coming up in December. A strategic planning meeting will be held on Wednesday following working group meetings on Monday and Tuesday, followed then by the plenary.

We will have more to report at the next meeting.

National Fire Protection Association NFPA 2

Chris LaFleur

Karen Quackenbush – NFPA 2 and NFPA 55 are both published and open for public review and comment. The 2020 edition for each of them are available online at www.nfpa.org. To view an editable copy or PDF, you will need to purchase the document.

FCHEA will be reviewing these documents for the next edition in the New Year through our Hydrogen Codes Task Force.

Should you have any technical concerns with these documents, please let us know.

Jennifer Hamilton - It is also good to coordinate activity within the Task Groups within NFPA 2 and they are working to get reports to the technical committee in the next year.

International Codes Council ICC

Spencer Quong

There is nothing to report at this time as the latest process just ended. We will have more to report when the next cycle begins.

CSA Group

Sara Marxen/Brent Hartman

• Recently Published

- HGV 4.3 *Fueling parameter evaluation* published in July 2019. Work on the next edition of HGV 4.3 will be to align with definitions in SAE J2601.
- CHMC 2 *Chemical compatibility (Non-Metals)* published in August 2019.

• Active Projects

- HGV 4.1 *Hydrogen dispensing system* Industry Review closed. Some final comments are being dispositioned by the TSC currently.
- HGV 4.9 *Hydrogen fueling stations*. All comments have been dispositioned. The revised draft is being edited and will then be finalized for Technical Committee Ballot.
- SPE 2.1.3 *Best practices for defueling, decommissioning, and disposal of compressed hydrogen gas vehicle fuel containers*
- HGV 2 *Containers*
- HPRD 1 *Thermally activated pressure relief devices*

- **New Projects Recently Launched**

- HGV 4.4 *Breakaway valves*
- HGV 4.6 *Manual valves*
- HGV 4.7 *Automatic valves*
- HGV 4.10 *Fittings*
- FC 1 *Stationary fuel cell power systems*

- **Projects Launching Soon**

- HGV 5.1 *Hydrogen Refueling Appliance*
- HGV 4.2 *Hoses for compressed hydrogen fuel stations*
- HGV 3.1 *Fuel system components for compressed hydrogen gas powered vehicles*

Society of Automotive Engineers (SAE)

Mike Steele

Vote on J2719 hydrogen quality specification ends on the 26th of November. This has enough votes to pass. Plan to host a WebEx before the end of the year to move the document into the affirmation phase.

The first meeting for 2020 of the fuel cell standards committee will be January 27th in Torrance, California. The usual Tuesday/Wednesday Safety and Interface meetings with the Standards meeting followed. Other meetings may be extended on either side to Monday and Thursday. Check the agendas for the two task forces to determine specific timing.

Other meeting dates will be locked in later on.

Compressed Gas Association (CGA)

Rob Early

The vent stack testing is being developed to determine radiation from vent stack fire to potentially reduce separation distances and vent stack size. We will be holding these tests in May in Minnesota.

FCHEA President Morry Markowitz attended the CGA Board Meeting recently to provide a state of the industry overview for fuel cells and hydrogen. As a result, the board is asking CGA to get more involved in hydrogen fueling applications.

Kelvin Hecht – The radiation testing is for which CGA document?

Rob Early – It is for G-5.5 Hydrogen Vent Systems. We believe the equations used are fairly conservative and are creating issues.

Jay Keller noted that Sandia has done a lot of work on these models. Rob Early confirmed that CGA is working with both Sandia and NREL.

American Society for Testing & Materials (ASTM)

Jennifer Hamilton

An in-person meeting will be held on December 9th. An agenda will be share soon.

More will be available at the next meeting after the in-person.

American Society of Mechanical Engineers (ASME)

Ray Rahaman

We recently had our B31.12 hydrogen pipes and pipeline code teleconference on November 8th. This was my first meeting since taking over the committee. We are looking at potentially restructuring the committee as it has been dormant for a while. There were a few items left hanging from mid-2018 which is pending the revision of the standard coming out in the end of December.

VI. Discussion Topics

Facilitating Deployment

All

No items at this time.

Center for Hydrogen Safety

Nick Barilo

Karen Quackenbush - This week the Center for Hydrogen Safety is hosting some workshops in New Jersey and Delaware.

Jay Keller – There was a Hydrogen Safety Panel meeting held in conjunction with the 1st Annual Center for Hydrogen Safety Conference. The event went well and the audience was different from what we normally see, in that it included a wider variety of stakeholders.

Laura Hill – Another event will be held in conjunction with Japan in the Spring.

Jennifer Hamilton – There is also talk of having something in conjunction with SPI as well.

Regulatory Matrix Review and Comment

Karen Quackenbush

Please direct any updates, questions, or comments to Karen Quackenbush by email at kquackenbush@fchea.org.

Updated September 30, 2019 - <http://www.fchea.org/s/FCHEA-Regulatory-Matrix-markup-September-30-2019.pdf>

Permitting and Installation of Hydrogen Fueling Stations

Jennifer Hamilton - Air Products has restored their facility to full capacity and the hydrogen supply situation has improved.

California Station Implementation

Jennifer Hamilton

The HySTEP device for 4.3 data collection will be going under some mandatory maintenance in December.

The next grand funding opportunity should be released soon from the California Energy Commission.

California Div. of Measurement Standards/Fuel Quality / Metrology

Christina Daniels

We just closed our last comment period on accuracy measuring devices and are doing routine sampling throughout the state.

The comment period was about incorporating the NIST 7.0 accuracy class into our rulemaking. We had originally explored removing the 2 and 3 accuracy classes but based on industry feedback they were kept in the rulemaking.

**Legal Metrology Standards Hydrogen Fuel
Quality and Measurement**

Juana Williams/Ralph Richter

No report at this time.

VII. Open Discussion & Other Issues

Kelvin Hecht – There is a teleconference tomorrow harmonizing the FC 1 stationary fuel cell standard with the newly published international standard. This activity has stated and will eventually lead to a new edition of FC 1.

VIII. Next Meeting – Wednesday, December 18th at 3:30 PM.