

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

**Wednesday, November 7, 2018
TIME: 3:00 – 4:00 pm (Eastern Standard Time)**

Minutes

Attendees

**Christina Daniels
Connor Dolan
Jay Keller
Juana Williams
Justin Wu
Karen Quackenbush**

**Laura Hill
Mike Steele
Morry Markowitz
Nha Nguyen
Norm Newhouse
Rob Early**

**Sara Marxen
Stella Papasavva
Yuk Wong
Eihusen – Hexagon
Carl Rivkin
Jennifer Hamilton**

I. Welcome and Housekeeping Items

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

II. DOE/HQ Update

Laura Hill

DOE / FCHEA H2 Fuels Workshop – Thursday, November 15th

III. C&S 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).

WG 24 will hold its meeting during the ISO TC 197 Meeting in December. There will also be a strategic workshop meeting on the Wednesday that week.

IV. Global Technical Regulations

Nha Nguyen

Recently finished the 4th meeting the week of October 15th. Continued to discuss the technical issues for Phase 2. Focused mainly on compatibility, improvement of the current requirements and test procedures for the GTR developed during Phase 1, also adding a fire test more consistent by specifying additional parameters, potential to add a long term stress rupture requirement as part of the cycling test.

Assigned five main tasks to five task force teams.

Task Force 1 – requirements for heavy vehicles and buses. No significant progress to date. Will try and conduct additional meetings, mainly webex, every month.

Task Force 2 – Receptacle of the vehicle. Expect a proposal at the next meeting.

Task Force 3 – improvement of the test procedures and requirements of the GTR. Making good progress, should be finished and ready to present a proposal at the next meeting.

Task Force 4 – Fire Test. Mainly from the SAE J2579 meeting participants. Three parameters to be considered to make the fire test more consistent - fire width, height, and uniformity.

Task Force 5 – Recommendations from ISO Committee. Accepted some of the proposals submitted to clarify definitions. Rest of the proposal is ongoing or being discussed at this time.

Next meeting is scheduled for March 5 – 7 in North America, depending on where we can find a host. Either in Canada or US. Will inform this group if there is any interest in participating.

Mike Steele – Are they looking at just accepting the ISO or SAE document for TF 2, or creating another document within the GTR?

Nha – In Phase 1 we used some of the requirements from the industry standard, mostly copy and paste from SAE, without direct reference to the standard. The main requirement is that the geometry of the nozzle for different type of pressure would be identified so we do not get a situation where a higher pressure would be applied to a lower pressure tank. We are working on that. Still waiting on the proposal from TF 2. Our preference is to use the requirement directly without referring to the particular standard.

Mike – As long as we do not get too detailed, that is probably appropriate.

Stella – Do you have in mind any kind of vehicle?

Nha – Right now the requirement of the GTR is for passenger light-duty vehicles. In Phase 2 we are addressing issues of heavy duty vehicles and buses.

V. Codes and Standards Organization Updates

IEC TC 105

Kelvin Hecht

Tabled for the next meeting.

ISO/TC 197

Karen Quackenbush/ Glenn Scheffler/Jay Keller

Jay Keller – Opportunity to put in new work item proposals. Working with folks from Nikola Motors (heavy-duty trucking company), potentially putting in one or two NWIP. One on heavy-duty fueling protocol – potential interface activity. The language is very sensitive to ensure harmonization to not duplicate other efforts at SAE. Expect will happen and favorably received.

Stations document went out of its way to not write protocols, only what protocols need to apply with it.

The proposed co chairs / conveners for the activity is from Shell. On the hook from WG 24 to write the protocol. Also possibly Antonio Leads from Nikola.

NFPA 2

Carl Rivkin

The 2020 edition of NFPA 2 is moving along the path needed to be published in April 2019. What that means is that the ballot for the public comments that were acted on in August is being assembled by NFPA staff and will go out shortly. Ballot will be completed by January 23, 2019. That means the document will be issued by April 2019.

The 2020 edition will contain a number of issues to help hydrogen deployment including separation distances for gaseous storage systems and flexibility with repair facilities such as sensor locations.

ICC

Spencer Quong

No report at this time.

CSA

Sara Marxen

- **CSA HGV 4.3** (hydrogen fueling parameters) is an active project to develop the next edition. Industry review has closed for the draft document, and comments have been dispositioned by the TSC chair. A Doodle poll for next meeting will be sent today.
- **HGV 4.1** (stations) and **HGV 4.9** (dispensers) are new projects to develop the next edition. The TSC met during CSA's Committee Week in mid-October. Additional meetings will be scheduled soon.
- **CHMC 2** (chemical compatibility for non-metals) is an active project to develop the first edition. The Technical SubCommittee plans to send the draft standard for Industry/Public Review in early November, with the goal of publishing in early 2019.
- **CSA FC 6** is the International adoption of IEC 62282-2-100 IEC, fuel cell module standard, and passed TC ballot, and is expected to publish in early 2019.
- **ISO TC 197 Plenary (and WG Meetings)** will be co-hosted by CSA and SCC in Vancouver – December 3 - 7, 2018.
 - Working Group -21 (Compressors) – December 3
 - Working Group -24 (Stations) – December 3 - 4
 - Working Group -23 (Fittings) – December 4
 - Strategic Planning Meeting – December 5
 - Plenary Meeting – December 6/7

SAE

Mike Steele

First meeting of SAE in 2019 will be in February in the West Coast.

Next year can look forward to the issues of the GTR and the nozzle. Working to have the heavy-duty activities included in the next round of J2700. Looking for a trigger point to open up the SAE document and want to ensure that IEC folks are done with their piece prior to opening up SAE.

CGA

Rob Early

CGA continues to update the G5.5 hydrogen venting storage systems. Planning to conduct testing on radiation to determine how vent stack fires respond compared to calculated ones (liquid hydrogen). We will be incorporating real world data into calculations.

We have made some headway on the test protocols and will be closer to May 2019 before we run the actual testing. The work will review the impact of vent stacks on siting to reduce separation distances.

Jay Keller – closer linked to the pressley high FCH-JU project on liquid behavior, as well as the Sandia / NREL activities?

Rob – We are linked with NREL / Sandia, but not the FCH-JU.

Jay Keller – I will follow-up with you offline with the details.

ASTM

Jennifer Hamilton

The December interest and meeting will happen in Atlanta on the 11th and 12th. Have a meeting soon to go over the agenda. Should have data from the Interlaboratory Studies. Have samples out and labs have done the protocols, so will have data to report.

ASME

John Bendo

Justin Wu – Not much to report. We are finishing up the new edition of BW112, expect to be published in March. Next meeting will happen on March 12, 2019.

VI. Discussion Topics

Facilitating Deployment

Carl Rivkin

Collecting information on what has actually been the conditions with permits issued for hydrogen refueling stations to collect details on what alternative means and methods people have used when they can not meet prescriptive code requirements. Will assemble this information all in one place to help others with their permitting efforts. Would like to see if there is some way to develop the consistency with jurisdictions to determine how they evaluate them and how to get a variance. Work will culminate with a report that summarizes the station permits and will be completed this fiscal year. Have data from four or five stations now.

H₂USA Activities

Karen Quackenbush

RCS Joint Task Group met last Friday to discuss R&D needs to take into the FCHEA/DOE workshop Nov 15th.

H2@Scale

Jay Keller – I was invited to give a keynote lecture to Japanese maritime activities on liquid hydrogen storage, production, transportation on what we are doing in the US. Constrained my comments to the largely limited research that NREL / SNL are doing that differentiates greatly from the other lectures. What I want to leave with this group is the maritime activities both on board ship and off board port activities, the technical activities are prime for this application. Two people from Air Liquide and Linde that recognized that the activity is of interest.

Regulatory Matrix Review and Comment

Karen Quackenbush

Latest version of the Matrix is here (updated September 30) -

<http://www.hydrogenandfuelcellsafety.info/s/FCHEA-Regulatory-Matrix-markup-Sept-30-2018.pdf>

Please review this version of the Matrix and provide any updates to Karen Quackenbush at kquackenbush@fchea.org.

Permitting and Installation of Hydrogen Fueling Stations

CA Station Implementation

Jennifer Hamilton

We should have two upgrade stations this year, along with potential for two new ones. Anticipate that Shell will open the Sacramento station early next year.

Expect a draft of the next round of solicitations will come out from CEC by the end of the year.

CA DMS Fuel Quality / Metrology

Kevin Schnepf

No update at this time.

Legal Metrology Standards Hydrogen Fuel Quality and Measurement

Juana Williams/Ralph Richter

OIML R 139 “Compressed gaseous fuel measuring systems for vehicles”

During its October 2018 meeting in Hamburg, Germany, the CIML* approved a final draft revision of OIML R 139 (last published in 2014) expanding the application of the recommendation to further address hydrogen fueling systems. OIML R 139 (2018) is available on the OIML website at: <https://www.oiml.org/en/publications/recommendations>. Major changes for hydrogen fueling systems in the document include:

1. two new Accuracy Classes with the following maximum permissible errors (MPEs): for meters: 1.5 percent (2.0 AC) and 2.0 percent (4.0 AC); for complete systems: 2.0 percent and 3.0 percent (2.0 AC) and 4.0 percent and 5.0 percent (4.0 AC) for type evaluation/initial verification and for systems when in service, respectively, with no changes proposed to the MPEs for CNG fueling;

2. a minimum measured quantity (MMQ) not to exceed 1 kilogram;
3. revisions to durability test procedures to require only meters with moving parts be tested. Sections of the R 139 testing procedures were also modified making them applicable specifically to hydrogen fueling systems; and;
4. recognizing the “pre-cooler,” depressurization correction device, and compressors as part of the measuring system, where appropriate, in (OIML) R 139, Part 1: Metrological and technical requirements, Part 2: Metrological controls and performance tests, and Part 3: Report format for type evaluation.

*CIML- International Committee of Legal Metrology

VII. Open Discussion & Other Issues

VIII. Next Meeting – Wednesday, January 9, 2019 at 3:00 PM Eastern