

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

**Wednesday, April 17, 2019  
TIME: 3:00 – 4:00 pm (Eastern Standard Time)**

**Minutes**

**Attendees**

**Eric Nelson  
Eric Prause  
Greg Chirdon  
Jay Keller**

**Jennifer Hamilton  
Justin Lewis  
Karen Quackenbush  
Kevin Harris**

**Laura Hill  
Sara Marxen  
Spencer Quong  
Yuk Wong**

**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.
- Approved the meeting agenda.
- Approved the previous meeting minutes.

**II. DOE/HQ Update**

**Laura Hill**

There are two open FOAs. One is H2@Scalematerials to support infrastructure development and demonstrations. <https://eere-exchange.energy.gov/#Foald600decec-1f68-4c10-bda1-9ed3aadb0735>.

The other is a joint effort with Vehicle Technologies and the Bioenergy Office, addressing medium and heavy duty fueling. <https://eere-exchange.energy.gov/#Foald4940c6dc-dfe5-43ea-b5ac-f03bf0ea8c83>.

They both passed the concept paper deadline and close in May.

**III. C&S Events and Fuel Cell Safety Information**

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

**Karen Quackenbush**

Items to add to calendar of events:

The 8th International Conference on Hydrogen Safety (ICHHS 2019) will be held in Adelaide, Australia on 24-26 September, 2019.

CaFCP meetings – sent by e-mail.

Global Technical Regulation Phase II meeting in China – date June 17-20

CSA The 2019 Annual Conference & Committee Week will be held June 17-21 in Ottawa, Ontario, Canada.

**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](mailto:khall@fchea.org)) or Connor Dolan ([cdolan@fchea.org](mailto:cdolan@fchea.org)).

#### IV. Global Technical Regulations

Nha Nguyen

Materials from the last meeting are posted here: <https://wiki.unece.org/display/trans/GTR13-2-5th+session>. The next meeting will take place in China in June 17-21.

#### V. Codes and Standards Organization Updates

##### IEC TC 105

Kelvin Hecht

##### TC105 – Fuel Cell Technologies

- IEC 62282-1-100 Ed.1  
Fuel cell modules – Safety
  - Approved for FDIS
- IEC 62282-3-100 Ed.2 (Steve Maurer – FuelCell Energy)  
Stationary fuel cell power systems - Safety
  - Published 2/2019
  - Plan to harmonize with CSA FC1 (and Canadian standard)
- IEC 62282-6-101 Ed.2 (Karen Quackenbush)  
Micro fuel cell power systems – Safety
  - Re-establishing activity
- IEC 62282-6-400 Ed.1  
Micro fuel cell power systems – Power & Data Interchangeability
  - In publication
- IEC 62282-8-101 Ed.1  
Energy storage systems using fuel cell modules in reverse mode – Test procedures for solid oxide single cells and stacks
  - In translation for FDIS
- IEC 62282-8-102 Ed.1  
Energy storage systems using fuel cell modules in reverse mode – Test procedures for PEM single cells and stacks
  - Approved for FDIS
- IEC 62282-8-201 Ed.1  
Energy storage systems using fuel cell modules in reverse mode – Power-to-power systems - Performance
  - Approved for FDIS
- IEC TS 62282-9-101  
Evaluation methodology for the environmental performance of fuel cell power systems

based on life-cycle thinking – Streamlined life-cycle considered environment performance characterization of stationary fuel cell power systems for *residential* applications

- CD circulated
- IEC TS 62282-9-102  
Fuel cell technologies - Part 9-102: Evaluation methodology for the environmental performance of fuel cell power systems based on life cycle thinking - Product category rules for environmental product declarations of stationary fuel cell power systems and alternative systems for *residential* applications
  - CD circulated

## **ISO/TC 197**

**Karen Quackenbush/ Glenn Scheffler/Jay Keller**

Many documents are entering Final Draft International Standard (FDIS) stage. They are undergoing technical editing to be submitted to ISO Central Secretariat for processing. Experts are anxiously awaiting circulation of the FDIS documents, which were anticipated during the first quarter of 2019.

## **NFPA 2**

**Carl Rivkin**

Carl Rivkin has recently left NREL for a new position at Nikola Motors. Staff will reach out to him to determine whether he will continue to represent NFPA 2 in this group.

## **ICC**

**Spencer Quong**

Nothing new to report.

## **CSA**

**Sara Marxen**

- **HGV 4.3** (hydrogen fueling parameters) is an active project to develop the next edition to include MC formula based requirements. A meeting of the Technical Subcommittee will be scheduled for the week of April 26, after which the document is expected to be sent for ballot through the Hydrogen Transportation Technical Committee in late April or early May 2019.
- **HGV 4.1** (dispensers) is an active project to develop the next edition. The TSC continues to meet to disposition member comments. The next meeting of the TSC is planned for April 24, 2019.
- **HGV 4.9** (stations) is an active project to develop the next edition. The document is currently out for Industry Review with closing date of May 10, 2019.
- **CHMC 2** (chemical compatibility for non-metals) is an active project to develop the first edition. The draft standard is expected to be at Technical Committee Ballot in May 2019.
- **FC 5** (Hydrogen generators) is an international adoption of ISO 16110-1. The document is still pending ANSI BSR-9 approval. Anticipate the document publishing October 2019.

- As part of the **CSA Annual General Meeting**, the Hydrogen Technical Committee and Technical Subcommittees will be meeting in Ottawa, Canada during the week of June 17-20<sup>th</sup>. Hydrogen activity will occur June 18-20
  - June 18 – TC meeting (1 – 5 pm)
  - June 19 – HGV 4.3 TSC meeting (8 am – 12 pm)
  - June 19 – HGV 4.9 TSC meeting (1 – 5 pm)
  - June 20 – HGV 4.1 TSC meeting (8 am – 12 pm)

**SAE**

**Mike Steele**

Meetings in June as reported last month.

**CGA**

**Rob Early**

No report.

**ASTM**

**Jennifer Hamilton**

There are a number of meetings coming up. All is quiet on the ILS front, which is good. ASTM is working on a Linked In page.

**ASME**

**John Bendo**

**VI. Discussion Topics**

No report.

**Facilitating Deployment**

**Carl Rivkin**

No report.

**H<sub>2</sub>USA Activities**

**Karen Quackenbush**

Roadmapping activity for the Northeast is still active. Jay noted the Market Support and Accelerating Working Group will hold a meeting on April 25<sup>th</sup>. The meeting will include an update on progress being made to address regulatory barriers in the Northeast.

**Regulatory Matrix Review and Comment**

**Karen Quackenbush**

Latest version of the Matrix is here (updated March 31) -

<http://www.hydrogenandfuelcellsafety.info/s/FCHEA-Regulatory-Matrix-Markup-March-31-2019.pdf>

This is a new version of the matrix, showing progress in the development of codes and standards for fuel cells and hydrogen infrastructure. New items include NIST Handbook 44, which will soon be considered for approval with permanent status and made available.

Please review this version of the Matrix and provide any updates to Karen Quackenbush at [kquackenbush@fchea.org](mailto:kquackenbush@fchea.org).

## Permitting and Installation of Hydrogen Fueling Stations

### CA Station Implementation

Jennifer Hamilton

The HyStep device is making its way to several stations in California. The station map has been updated, and is available at <https://cafcg.org/stationmap>.

A final CEC grant opportunity is anticipated soon.

### CA DMS Fuel Quality / Metrology

Kevin Schnepf

No report.


### Legal Metrology Standards Hydrogen Fuel Quality and Measurement

Juana Williams/Ralph Richter

Report provided by Juana by e-mail:

#### (1) U.S. Weights and Measures Standards Development Process

The National Conference on Weights and Measures (NCWM) met January 13-16, 2019 to hold its 104<sup>th</sup> Interim Meeting in Charleston, SC. The proposal for upgrading NIST Handbook (HB) 44 Section 3.39 Hydrogen Gas-Measuring Devices – Tentative Code to permanent status (intended to be enforced) with several modifications will be voted on for adoption July 14-18, 2019 in Milwaukee, WI. The final draft of the proposed code and

background discussions are: 1) embedded as an attachment  to this report; 2) available on the NCWM website under the Specifications and Tolerances Committee Report at: <http://www.ncwm.net/meetings/annual/publication-16>; and 3) on the NIST OWM Hydrogen: U.S. National Work Group (USNWG) website available at: <https://www.nist.gov/pml/weights-and-measures/legal-metrology-devices/hydrogen-us-national-work-group>.

Copies of the *current* 2019 NIST HB 44 hydrogen code are on the NIST OWM publications website available at: <https://www.nist.gov/pml/weights-and-measures/publications>. Also available on the NCWM website is the September 2018 report from the California Division of Measurement Standards on “Hydrogen Gas-Measuring Device Test Data.”

The USNWG will meet shortly to develop input for the NCWM on the latest proposal for the hydrogen code. Further input is encouraged from the hydrogen and weights and measures communities on this latest NCWM proposal.

The most significant modifications to the code are:

- A reduction in the size of the required larger test draft to the lesser quantity of five times the MMQ rather than ten times the MMQ or a draft at 4 kg instead of 1 kg, whichever is larger (see edits to modify paragraphs N.3. Test Drafts, N.4.2. Gravimetric Tests and N.4.3. PVT Pressure Volume Temperature Test on pages S&T-66 through S&T-67);
- Recognition of the use of a master meter test standard to verify a dispenser’s accuracy is eliminated from the code (see edits to delete paragraphs N.4.1. Master Meter (Transfer) Standard Test and N.4.1.1. Verification of Master Metering Systems on page S&T-66);

- The proposal continues to include a new minimum size requirement of 1000 grams for test drafts when performing a repeatability test for accuracy (see edits to modify paragraphs N.6.1.1. Repeatability Tests and T.3. Repeatability on page S&T-67); and
- The proposal continues to include a new performance tolerance to widen (2x) the allowable error for deliveries at the MMQ (typically 500 grams) to  $\pm 14$  percent (see proposed new paragraph T.6. Tolerance – on Minimum Measured Quantity (MMQ) on page S&T-67).

## **VII. Open Discussion & Other Issues**

There has been a suggestion to include work on cybersecurity efforts relating to stationary fuel cells as well as vehicles on the matrix for tracking. We are looking for information of who might have efforts in this area. Will check SAE for vehicle-related efforts. In the meantime, EERE in partnership with the Office of Cybersecurity, Energy Security and Emergency Response (CESER), seeks to establish a Clean Energy Manufacturing Innovation Institute dedicated to advancing cybersecurity in energy efficient manufacturing. The FOA is available here: <https://eere-exchange.energy.gov/#Foalddfdeec54-a32a-4113-bd78-04aa84185034>.

The new Center for Hydrogen Safety has been launched at [www.aiche.org/CHS](http://www.aiche.org/CHS).

The Hydrogen Safety Panel and H2Tools activities will transition there. There will be significant international coordination and collaboration. The U.S. DOE and the CaFCP are collaborators from the U.S.

## **VIII. Next Meeting - Wednesday June 12 – 3-4pm Eastern.**