

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

**Wednesday, December 18, 2019
TIME: 3:30 – 4:30 pm (Eastern Standard Time)**

Minutes

Attendees

**Chris LaFleur
Christina Daniels
Connor Dolan
Eric Prause
Jay Keller
Jennifer Gangi
Jennifer Hamilton
Juana Williams**

**Justin Lewis
Karen Quackenbush
Kelvin Hecht
Laura Hill
Mark Duda
Mark Richards
Nick Barilo
Norman Newhouse**

**Ray Rahaman
Rob Early
Sara Marxen
Shashi Kuppa
Yuk Wong**

I. Welcome and Housekeeping Items

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

II. DOE/HQ Update

Laura Hill

We have a new Secretary of Energy Dan Brouillette. Dan has served as the Deputy Secretary previously and is familiar with the work of the Fuel Cells Office.

We have a new budget.

A notice of intent for FY 2020 FOA has been posted. Once that is out, DOE is unable to speak on any issues regarding those topics. Please direct questions to the FOA inbox.

Newsletter sign up link - <https://www.energy.gov/eere/fuelcells/subscribe-hydrogen-and-fuel-cells-news>.

DOE FOA - <https://www.energy.gov/eere/fuelcells/articles/energy-department-announces-notice-intent-issue-funding-opportunity-0>

Justin Lewis (FCHEA) – The House passed the appropriations funding yesterday and it now goes to the Senate for a final vote and then the President for signature. That is expected later this week. Current federal funding expires on Friday at midnight.

The Fuel Cell Technologies Office will be funded at \$150 million.

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. FuelCellStandards.com Announcement

Kelvin Hecht / Karen Quackenbush

<http://fuelcellstandards.com/>

FCHEA is working with Kelvin Hecht and the fuel cell standards website is now back online.

This is a comprehensive listing of hydrogen and fuel cell standards from around the world that is available to view the latest status of these efforts.

V. Global Technical Regulations

Ian MacIntire

Shashi Kuppa – There is no further update following the recap provided in November.

VI. Codes and Standards Organization Updates

International Electrotechnical Commission IEC TC 105

Kelvin Hecht

○ Active Programs

- **IEC 62282-2-100 (2nd edition)**
 - Fuel Cell Modules - Safety
 - FDIS
- **IEC 62282-3-201 Amendment 1**
 - Small Fuel Cells - Performance
 - Comments to CD received
- **IEC 62282-4-101 Ed. 2**
 - Forklifts - Safety
 - CD circulated
- **IEC 62282-4-600**
 - Fuel Cell / Battery Hybrid Excavator
 - CD in progress
- **IEC 62282-6-100**
 - Micro Fuel Cells – Safety
 - CD in progress
 - Karen Quackenbush – someone is leading a methanol specific Part 2 document. If that is of interest to you, please contact Karen for more information.
- **IEC 62282-8-101**

- Energy Storage – Fuel Cells in Reverse Mode – SOX single cells
- In publication

- **IEC 62282-8-201**
 - Energy Storage – Fuel Cells in Reverse Mode – Performance
 - In publication

- **IEC 62282-9-101**
 - Methodology for Life Cycle Thinking – Streamlined considerations
 - DTS

- **IEC 62282-9-102**
 - Methodology for Life Cycle Thinking – Product category rules
 - DTS

International Standards Organization ISO/TC 197

Karen Quackenbush/Jay Keller

Karen Quackenbush - Just had a plenary and a number of working group meetings last week in France.

The Final Draft International Standard for ISO 19880-1 General Requirements for hydrogen fueling stations document has come out for ballot. Any editorial comments can be considered at this time, but further technical changes will not be considered until the next edition.

As this document is now locked, other working groups can proceed with their own standards.

Hoses and hose assemblies are proceedings with their next revision to harmonize with the - 1 document. They are also discussing if heavy-duty should be included in this effort or if additional requirements are needed.

Compressors work is continuing and manufacturers are participating from almost all technology sectors. One last remaining gap is electrochemical compressors and we are working to engage that sector. We plan to submit a committee draft that is technology neutral.

Jay Keller – A couple of issues to highlight to this group. The stationary tank storage has been plagued with problems. The latest version failed and a robust discussion on next steps ensued at the Plenary. TC/197 issued an invitation to member countries to submit a New Work Item Proposal to restart the effort.

A New Work Item Proposal was put forward for the heavy-duty fill protocol, supported primarily by Nikola and Shell. The organizational structure moving forward is still being discussed.

National Fire Protection Association NFPA 2

Chris LaFleur

We had a reboot kickoff with all of the active task groups with NFPA 2 to ensure they are aware of all the deadlines for the upcoming cycle. There are six or seven task groups in

total. We will target holding a pre-first draft meeting to ensure that the first draft and total code cycle works efficiently. This meeting would be held in mid-April. That gives us time to receive initial input from the Task Groups and have time for the public comment cycle to begin on June 30th.

The next cycle will be 2023 for NFPA 2 and NFPA 55.

International Codes Council (ICC)

Spencer Quong

Karen Quackenbush - There is no new activity to report as they are currently in between cycles. The next cycle will begin again in 2020.

CSA Group

Sara Marxen/Brent Hartman

- Active Projects
 - *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. Expect to ballot late 2019 or early 2020.
 - *HGV 4.1 Hydrogen dispensing systems* – TSC has completed disposition of industry review comment. The document is being finalized for a final Technical SubCommittee review and then Technical Committee Ballot. Expect to ballot 1Q 2020.
 - *SPE 2.1.3 Best practices for defueling, decommissioning, and disposal of compressed hydrogen gas vehicle fuel containers* – Work is completed and expected publication in February 2020.
 - *HGV 2 Containers*
 - *HPRD 1 Thermally activated pressure relief devices*
 - *HGV 4.4 Breakaway valves* – Next meeting is January 7, 2020
 - *HGV 4.6 Manual valves* – See HGV 4.4
 - *HGV 4.7 Automatic valves* – See HGV 4.4
 - *HGV 4.10 Fittings* – Next meeting is January 14, 2020
 - *FC 1 Stationary fuel cell power systems* – Meeting this week
- 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*
- 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.

Society of Automotive Engineers (SAE)

Mike Steele

J2799 communications and software document has been published and is now publicly available.

Meetings will be held in January and the notice will be sent out shortly for registration.

The Safety and Interface Task Force agendas will be available that show the dates that meetings will be held.

These meetings will be held the week of January 27th in Torrance, California.

Compressed Gas Association (CGA)

Rob Early

Radiation testing underway for G5.5, which will be conducted in May in Minnesota. We hope to have good results by the summer. This standard will affect the size of stacks and separation distances.

American Society for Testing & Materials (ASTM)

Jennifer Hamilton

There are potentially three or four more labs participating in the Interlaboratory Study. We have a technical lead for a document that was going to expire on December 31st.

For the June meeting in D.C. we have planned a workshop on hydrogen sampling. We are looking for abstracts for that meeting. If you are interested, please contact Jennifer Hamilton and/or Christina Daniels.

American Society of Mechanical Engineers (ASME)

Ray Rahaman

The latest edition of B31.12 hit my desk on Friday, December 13th. The digital copy is now out and available.

VII. Discussion Topics

Facilitating Deployment

All

No update at this time.

Center for Hydrogen Safety

Nick Barilo

We had our first safety conference in Sacramento in October. As a takeaway, one half of the audience was traditional industry players, but about half of the audience were new players.

In November, two workshops were held in Delaware and New Jersey. These were well received.

The Center for Hydrogen Safety had some actions following the incidents held in the Spring. There is a brochures now available on hydrogen safety for the public. An additional brochure is being developed for other specific stakeholder audiences.

Frist responder training previously housed on H2Tools.org has now been deployed on the AIChE university online website. The training has also been updated and will be updated again in 2020. We have completed video shoots for hydrogen safety activities for this effort and are finalizing these five new videos.

We are planning new conferences in 2020. We plan on collocating with the solar folks in Anaheim, putting on an event Germany in September / October, and another in Asia in June.

Regulatory Matrix Review and Comment

Karen Quackenbush

The next revision of the FCHEA Regulatory Matrix will come out at the end of this month. There will be a significant number of updates, due to the annual meetings of IEC/TC 105, CSA, and ISO/TC 197 all having taken place during this quarter. 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

California Station Implementation

Jennifer Hamilton

We are working with the hydrogen suppliers to post a statement on the Partnership website in the near-future.

We are waiting for the release of the next grant funding opportunity.

The Harrison Street station opened on December 2nd.

California Div. of Measurement Standards/Fuel Quality / Metrology **Christina Daniels**

We are continuing sampling. We are looking into purchasing a particulate sampler. We had great discussions last week at the ASTM meetings to perform particulate sampling.

Legal Metrology Standards Hydrogen Fuel Quality and Measurement

Juana Williams/Ralph Richter

The 2020 editions of NIST Handbooks 44 the device code and 130 which has the hydrogen method of sale are now available on our website. The permanent code adopted in July of this year are included in these editions.

The website for our publications is <https://www.nist.gov/pml/weights-and-measures/publications>.

- [NIST Handbook 44](#): Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices - Current Edition
- [NIST Handbook 130](#): Uniform Laws and Regulations in the Areas of Legal Metrology and Engine Fuel Quality - Current Edition

VIII. Open Discussion & Other Issues

OSHA standard

There was some discussion that the government would update OSHA 103 on hydrogen, which is 30 years old. Is there any activity to update that document or work to have it withdrawn?

When we last spoke with OSHA, they recognized it was an issue, but they had other priorities.

Action: *FCHEA will take this back as an item to approach OSHA early in the new year to gauge whether increased interest might elevate this update within OSHA.*

Maritime regulations, codes, and standards

As fuel cell-powered vessels continue to develop commercially, we anticipate that ISO and other groups will start looking at this energy space to provide some assistance.

IX. Next Meeting – Wednesday, February 5 at 2:00 PM US Eastern