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

**Wednesday, February 3, 2020**
**TIME: 2:00 – 3:00 pm (Eastern Standard Time)**

**Minutes**

**Attendees**

| | | |
|---|---|---|
| **Bob Boyd** | **Karen Quackenbush** | **Norman Newhouse** |
| **Chris LaFleur** | **Quailan Homann** | **Ian MacIntire** |
| **Connor Dolan** | **Jennifer Gangi** | **Robert Davidson** |
| **Jay Keller** | **Antonio Ruiz** | **Eric Prause** |
| **Kelvin Hecht** | **Christina Daniels** | **Eric Nelson** |
| **Rob Early** | **Mark Richards** | **Mike Steele** |
| **Laura Hill** | **Jennifer Hamilton** | **Stella Papasavva** |
| **Owen Hopkins** | **Spencer Quong** | **Morry Markowitz** |
| **Sara Marxen** | **Ray Rahaman** | |
| **Juana Williams** | **Kevin Harris** | |
| **Will James** | **Mark Siira** | |

## I. Welcome and Housekeeping Items

- FCHEA's anti-trust guidelines - Available on FCHEA's members only website and a copy can be provided to you on request
- Review Agenda
- Approve Minutes

## II. DOE/HQ Update — Laura Hill

New leadership and new nominees at DOE.

The Secretary of Energy is Jennifer Granholm was confirmed this morning.

Acting and Nominee Principal Deputy Assistant Secretary for EERE is Kelly Speakes-Backman.

DOE is being rearranged, however EERE will still be the arm under which the HFTO falls. New org chart is available here - https://www.energy.gov/leadership/organization-chart.

There is an open FOA from HFTO. Concept papers were due two weeks ago and are under review.

General plans for the new administration is higher TRLs than what was pivoted to in the previous administration.

The Committee discussed standards related to hydrogen within OSHA and other areas.

Now is a good time to revisit what industry can do to work with the administration.

For those interested in this topic, please send us an email to discuss further to determine how FCHEA can work to resolve these concerns (cdolan@fchea.org).

## 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**

The Task Forces are continuing to work ahead of the IWG meeting planned for March 23 – 26.

Task Force 0 – working on drafting update to the GTR. Goal is to provide a first draft of the revision document available for review, which should include most areas of agreement. Considering ways to receive feedback on that.

## V. Codes and Standards Organization Updates

### Institute of Electrical and Electronics Engineers **Mark Siira**

Interconnection standards are going through final edits and hope to have approved through the ends of 2021. Those are moving very fast. These standards include a guide for energy storage systems. There maybe some commonality with this industry as it deal with bidirectional power flow and other data points.

Another new area of activity is IEEE 2030 standard for interoperability. 350 people in WG and just now kicking off into subgroups to define interfaces required over next ten years if you connect to the grid. Could be another interesting area for this group. Could benefit commercial viability of these systems.

A conformance assessment checklists for commissioning systems is just getting started.

FCHEA will be presenting to the IEEE standards coordinating committee later this month on our association and the industry's efforts.

### International Electrotechnical Commission IEC TC 105 **Kelvin Hecht**

**USA TC105 Participation**

| Application | | Convener | Active USA Participation |
|---|---|---|---|
| **Stationary** | | | |
| | Module | Germany | **Yes** |
| | Power Plant | | |
| | Safety | USA | **Yes** |

| | | | |
|---|---|---|---|
| | Performance | Japan | Minimal |
| | Performance - Small | Japan | No |
| | Installation | Germany | **Yes** |
| | Life-cycle | Japan | No |
| | Heat-Power | Switzerland | Minimal |
| **Portable** | | Japan | Minimal |
| **Micro** | | | |
| Safety | | USA | Minimal |
| Performance | | Japan | No |
| Cartridge | | Japan | No |
| Data | | S. Korea | No |
| **Fork Lifts** | | | |
| Safety | | Japan | Minimal |
| Performance | | Japan | No |
| **Energy Storage (F/C in reverse)** | | | |
| SOX Performance | | Italy | Minimal |
| PEM Performance | | S. Korea | No |
| Power to Power Performance | | Japan | No |
| **Excavators** | | S. Korea | No |
| **New activities** | | | |
| **Drones** | | China | Plug/Infinity |
| **Railway** | | China | Sandia |

**International Standards Organization ISO/TC 197** **Karen Quackenbush/Jay Keller**

Call for experts has been released for the new WG 24 which has been restructured and renamed to accommodate the new high flow rate / heavy-duty refueling protocol efforts. If you are interested in this effort, please let us know. They are planning their first meeting on March 16.

WG 28 - Hydrogen Quality Assurance – ISO -8 is going to FDIS vote of the amendment that aligns the hydrogen quality and hydrogen quality control documents.

Another call for experts is anticipated soon for a discussion on liquid hydrogen behaviors. If you are interested, please contact Jay Keller.

**National Fire Protection Association NFPA 2** **Chris LaFleur**

A formal ballot was planned for mid to late January, but it has not been sent out yet. It is anticipated now to be mid-February. Once the ballot is released the first draft will be shared.

There will be meetings between now and the end of the public comment periods for the various task forces to discuss issues.

**International Codes Council (ICC)** **Spencer Quong**

Public input comments were due in January. We are waiting for the ballot documents. The next ICC Committee Action Hearings is planned for April 21st.

**CSA Group** **Sara Marxen/Brent Hartman**

| Technical Committees | |
|---|---|
| Fuel Cell Technical Committee | Actively seeking participation for Regulatory Authority and User Interest categories. Contact: mark.duda@csagroup.org |
| U.S. TAG to IEC/TC 105 | The US TAG to IEC TC 105 is considering hosting TC 105 Plenary meeting to coincide with 2022 General Meeting in San Francisco and seeking interest from members and stakeholders to support the event. Contact: mark.duda@csagroup.org if you are interested in becoming a sponsor for this TC 105 Plenary in 2022. |

| Active Projects | | |
|---|---|---|
| **TSC** | **Title** | **Status** |
| HGV 4.4 | Gaseous hydrogen – Fuelling stations – Valves | This is an adoption of ISO 19880-3 valve standard with North American deviations. $H_2$TTC ballot closed with a negative vote regarding the breakaway device value. A TSC meeting is scheduled for February 10 to discuss. |
| HGV 2 | Compressed hydrogen gas vehicle fuel containers | The HGV 2 document published in January 2021. |
| HPRD 1 | Thermally activated pressure relief devices for compressed hydrogen vehicle fuel containers | Industry/public review closed. TSC has met to discuss comments. TC Ballot is expected in February 2021. |
| HGV 4.10 | Fittings for use in compressed gaseous hydrogen fuelling stations | The HGV 4.10 document published in January 2021. |

| | | |
|---|---|---|
| HGV 4.3 | Test methods for hydrogen fueling parameter evaluation | TSC members submitted comments on the draft document. The TSC has meetings planned in February (5, 12, 19 & 26) to review and disposition comments. |
| HGV 4.2 | Hoses for dispensing compressed gaseous hydrogen | TSC continues to meet to align content with ISO 19880-5, hose standard. The draft is currently posted for public review (closes February 4). Click here to access: https://publicreview.csa.ca/Home/Details/4013 |
| FC 1 | Stationary fuel cell power systems | This is an adoption of IEC 62282-3-100. The document is currently being balloted to the Fuel Cell Technical Committee for approval. |
| HGV 5.2 | Compact Hydrogen Refueling Systems | Project kick-off meeting was held in January. TSC meetings are scheduled every three week for content development. Next meeting is scheduled for February 17, 2021. |
| HGV 3.1 | Fuel system components for compressed hydrogen gas powered vehicles | Project kick-off scheduled for February 2021. |

**Society of Automotive Engineers (SAE)** **Mike Steele**

With pace of documents out there, delayed planned meeting in January. J2600 and J2601-4 are having their comments adjudicated and anticipate out in coming weeks. When hear from these groups, will have a better understanding of meeting timelines.

**Compressed Gas Association (CGA)** **Rob Early**

CGA will be offering a webinar *Setting the Standard – CGA's Role in the Hydrogen Revolution* on Wednesday, May 19. It is scheduled for 2:00-4:00 PM EST and will be available to CGA members and non-members. More details to follow.

Status of current and future publications:

| **Standard** | **Current edition** | **Status** |
|---|---|---|
| CGA G-5, *Hydrogen* | 8th (2017) | Deadline to submit proposed changes for next edition is 7/7/2022. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-019 |
| CGA G-5.3, *Commodity specification for hydrogen* | 7th (2017) | Deadline to submit proposed changes for next edition is 6/4/2022. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-013 |

| Standard | Current edition | Status |
|---|---|---|
| CGA G-5.4, *Standard for hydrogen piping systems at user locations* | 6th (2019) | Deadline to submit proposed changes for next edition is 12/22/2024. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-54 |
| CGA G-5.5, *Hydrogen vent systems* | 3rd (2014) | The 4th edition is in review by CGA Standards Council. Heat radiation testing at Chart Industries in New Prague, MN date is to be determined. |
| CGA G-5.6, *Hydrogen pipeline systems* | 1st (2005 – reaffirmed 2013) | Deadline to submit proposed changes for next edition is 8/1/2022. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=19-018 |
| CGA H-1, *Service conditions for portable, reversible metal hydride systems* | 2nd (2011) | Deadline to submit proposed changes for next edition is 2/3/2022. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-033 |
| CGA H-2, *Guideline for classification and labeling of hydrogen storage systems with hydrogen absorbed in reversible metal hydrides* | 2nd (2018) | Deadline to submit proposed changes for next edition is 6/4/2022. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-012 |
| CGA H-3, *Standard for cryogenic hydrogen storage* | 3rd (2019) | Deadline to submit proposed changes for next edition is 12/1/2023. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-036 |
| CGA H-4, *Terminology associated with hydrogen fuel technologies* | 3rd (2020) | Deadline to submit proposed changes for next edition is 12/1/2024. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-59 |
| ANSI/CGA H-5, *Standard for bulk hydrogen supply systems* | 3rd (2020) | The deadline to submit proposed changes for the next edition is 2/26/2024. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-010 |
| CGA H-10, *Combustion safety for steam reformer operation* | 2nd (2018) | Deadline to submit proposed changes for next edition is 12/1/2023. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-038 |
| CGA H-11, *Safe start-up and shutdown practices for steam reformers* | 2nd (2020) | Deadline to submit proposed changes for next edition is 8/11/2025. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-30 |

| Standard | Current edition | Status |
|---|---|---|
| CGA H-12, *Mechanical integrity of syngas outlet systems* | 1st (2016) | Deadline to submit proposed changes for next edition is 3/1/2022. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=21-016 |
| CGA H-13, *Hydrogen pressure swing adsorber (PSA) mechanical integrity requirements* | 1st (2017) | Deadline to submit proposed changes for next edition is 8/1/2022. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-027 |
| CGA H-14, *HYCO plant gas leak detection and response practices* | 1st (2018) | Deadline to submit proposed changes for next edition is 12/8/2023. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-045 |
| CGA H-15, *Safe catalyst handling in HYCO plants* | 1st (2020) | Deadline to submit proposed changes for next edition is 9/1/2025. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-59 |
| CGA H-XXX (TBD), *Small scale hydrogen production and delivery* | New publication not released yet | Task force is creating first draft that will then go to the CGA membership for review. |
| CGA P-28, *OSHA process safety management and EPA risk management plan guidance document for bulk liquid hydrogen supply systems* | 4th (2014) | The draft of the 5th edition is in staff review before going to Standards Council for final review. |
| CGA PS-31, *Position statement on cleanliness for proton exchange membranes hydrogen piping / components* | 1st (2007 – reaffirmed 2019) | Deadline to submit proposed changes for next edition is 6/12/2025. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-16 |
| CGA PS-33, *Position statement on the use of LPG or propane tanks as compressed hydrogen storage buffers* | 1st (2008 – reaffirmed 2020) | Deadline to submit proposed changes for next edition is 12/10/2026. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-41 |
| CGA PS-46, *Position statement on roofs over hydrogen storage systems* | 1st (2017) | Deadline to submit proposed changes for next edition is 3/6/2023. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-012 |
| CGA P-48, *Position statement on clarification of existing hydrogen setback distances and* | 1st (2016) | Deadline to submit proposed changes for next edition is 2/12/2021. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=21-062 |

| Standard | Current edition | Status |
|---|---|---|
| *development of new hydrogen setback distances in NFPA 55* | | |

**American Society for Testing & Materials (ASTM)** **Jennifer Hamilton**

ILS that have been ongoing are working to come to a close. We are working to set up a workshop for December of this year for in line sampling for fuel quality.

We had someone from FAA which is another ASTM committee D02.J to reach out about hydrogen quality for aircraft.

**American Society of Mechanical Engineers (ASME)** **Ray Rahaman**

No update at this time.

## VI. Discussion Topics

**Facilitating Deployment** **All**

Will follow-up on OSHA discussion from earlier.

**Center for Hydrogen Safety** **Nick Barilo**

No update at this time.

**Regulatory Matrix Review and Comment** **Karen Quackenbush**

The latest version was circulated with today's meeting notice and was published on December 31, 2020.

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

NFPA 2 will have to post by March 2nd.

**Permitting and Installation of Hydrogen Fueling Stations**

**California Station Implementation** **Jennifer Hamilton**

HyStep testing has been delayed due to COVID restrictions.

We are looking forward to the next batch of stations that were funded by CEC.

SOSS system is still being updated to bolster within CAFCP to include things like heavy-duty stations.

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

Continue to support the market with testing and sampling.

Have found that the longer stations have been opened the owners understand things like how often to purge and what amount to do so to stay in appropriate ranges. Since this understanding, have found no issues.

As look into high flow rate / heavy-duty stations we may need to update our testing methods / equipment.

**Legal Metrology Standards Hydrogen Fuel Quality and Measurement** **Juana Williams/Ralph Richter**

No report at this time.

**VII. Open Discussion & Other Issues**

**VIII. Next Meeting** – Wednesday, March 3 at 2:00 PM US Eastern.