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

Wednesday, May 5, 2021
TIME: 2:00 – 3:00 pm (Eastern Standard Time)

Minutes

Attendees

Connor Dolan	**Will James**	**Eric Prause**
Jay Keller	**Yuk Wong**	**Juana Williams**
Laura Hill	**Jennifer Hamilton**	**John Eihusen**
Mark Richards	**Kelvin Hecht**	**Kevin Schnepp**
Mark Siira	**Quailan Homann**	**Antonio Ruiz**
Norman Newhouse	**Stella Papasavva**	**Robert Davidson**
Owen Hopkins	**Jennifer Gangi**	**Morry Markowitz**
Rob Early	**Carl Rivkin**	**Amy Ryan**
Sara Marxen	**Christina Daniels**	**Mike Steele**

I. Welcome and Housekeeping Items

- FCHEA's anti-trust guidelines reviewed.
- Agenda approved
- Minutes approved

II. DOE/HQ Update — Laura Hill

DOE Annual Merit Review is coming up.

The HTFO FOA is closed, but there are several open FOAs.

- SuperTruck 3: https://eere-exchange.energy.gov/Default.aspx#FoaId2f6fb61b-71a1-447c-a009-a4c460d08457
- Low Greenhouse Gas Vehicle Technologies: https://eere-exchange.energy.gov/Default.aspx#FoaIdbba83da0-9b58-4d26-8c6a-4a36230aed4f
- Nuclear FOA: https://www.id.energy.gov/NEWS/FOA/FOAOpportunities/FOA.htm

Check out the DOE Newsletter for the latest details.

Mark Richards is now taking on a federal role at a different team in the Hydrogen Technologies R&D program.

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).

ICHS planning for the Fall Meeting is in full swing. The event will be in late September. This meeting is being organized as a virtual meeting for 4 days. We are hoping that in person (in Scotland) attendance will be possible. There will be live (virtual) sessions, pre-recorded sessions, and posted pre-recorded papers. There is NO distinction in the papers other than presentation format due to Covid restrictions. This is turning out to be the largest meeting we have every had. It is really unfortunate that covid restrictions are resulting in this format.

IV. Global Technical Regulations — Ian MacIntire

The GTR 13 activity is moving ahead. Task Force 0 is in the process of writing.

Task Force 4 is the fire testing group and is moving forward with its 12th chapter in passing information off to the writing group.

V. Codes and Standards Organization Updates

Institute of Electrical and Electronics Engineers — Mark Siira

Two interconnection standards 1547.2 application guide and 1547.9 interconnection of energy storage systems. Likely starting a ballot process in August. These are likely to be embedded into the state regulations by the end of the year.

UL 1741 Supplement B on Inverters will be approved in the September 2021 timeframe.

Planning a workshop for the interconnection standards to be targeted towards the fuel cell and hydrogen industry.

International Electrotechnical Commission IEC TC 105 — Kelvin Hecht

- Proposal for a Joint Work Group on *Fuel Cell Systems for Railway* with IEC/TC9 (Electrical Equipment and Systems for Railways) was approved. Four TC105 members countries appointed experts to join China:
  - Canada
  - France
  - Japan
  - United States

- IEC 62282-7-2 *Single Cell and Stack Performance Tests for Solid Oxide Fuel Cells*
  - FDIS was approved on April 23rd and will be published as an International Standard

- TC105 has distributed a questionnaire to member countries to document adoption of its standards
  - Applicable US documents
    - IEC 62282-2-100 Stack

        - CSA FC6
    - IEC 62282-3-100 Stationary Fuel Cells – Safety
        - CSA FC1
    - IEC 62282-3- 200/201 Stationary Fuel Cells – Performance
        - ASME PTC50
    - IEC 62282-3-300 Stationary Fuel Cells – Installation
        - NFPA 853
    - IEC 62282-4-101 Forklifts – Safety
        - UL 2267
    - IEC 62282-5-100 Portable Fuel Cells
        - CSA FC3

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

WG 24 – Had previously published fueling station basic requirement standard. WG 24 is a new WG that is rescoped on activities related to fueling protocols and specifically those for Medium-Duty Vehicles and Heavy-Duty Vehicles. They had a full meeting recently with the WG and projects groups.. The groups are Task Force 1 – design and development requirements of all fueling protocols, Task Force 2 – communications, and Task Force 3 – heavy-duty refueling protocol.

WG 5 – Land Vehicle Reconnection Devices Refueling – Meeting this Friday. Joint meeting with SAE to discuss issue of certain H35 high-flow nozzles and H70 receptacles.

WG 33 – Just formed on hydrogen sampling and fuel analysis. First meeting is planned for the end of May or beginning of June. A call for experts has gone out and closed at the end of April. Anyone still wishing to join is welcome to contact Jay or Karen.

WG 15 – Planning to meet on May 13 – Cylinders and Tubes for Stationary Storage.

WG 30 – Joint Working Group – Fuel system components meeting on May 27th.

WG 27 – Hydrogen Quality – Meeting at 9 AM on June 9th.

WG 28 – 19880-8 FDIS passed for the amendment and final publication should be coming out soon.

National Fire Protection Association NFPA 2 Chris LaFleur

NFPA 2 – Starting second draft phase. Comments due by June 3rd. You can currently only make changes for the second draft to items that were changed in the first draft or relate to comments that were touched on in the first draft.

There are a number of task groups on enclosures, vents, vent stacks, and fire extinguishers. There is a lot of work going on by the groups that are formed that will be submitting comments.

International Codes Council (ICC) Spencer Quong

Fire code action committee submitted a proposal for hydrogen mobile fueling without limits on amount of fuel.

Some exemptions to certain things for high occupancy or MAQs were built into the code years ago, including hydrogen fuel storage on top of canopy or service station, piping, fuel cells.

There is a new natural gas committee to develop standards for certified mobile fueling systems. This is focused on natural gas now, but it seems like there are allowances in the various codes for siting these things now. This would be a product standard and could be something that goes into the back of a pickup truck to refuel a vehicle in need on the road, at home, or at an event. Eventually this would go into hydrogen as well.

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 – Fueling stations – Valves	This is an adoption of ISO 19880-3 valve standard with North American deviations. The document is being prepared for publication.
HPRD 1	Thermally activated pressure relief devices for compressed hydrogen vehicle fuel containers	The HPRD 1 document published in March 2021.
HGV 4.3	Test methods for hydrogen fueling parameter evaluation	TSC members submitted comments on the draft document. The draft document is out for Industry and Public Review. Industry review closes on May 28, 2021. Public review closes June 27, 2021. Click here to access: https://publicreview.csa.ca/Document/Manage/4180
HGV 4.2	Hoses for dispensing compressed gaseous hydrogen	TSC continues to meet to align content with ISO 19880-5, hose standard. TSC continues to review Industry and Public Review comments in preparation of Technical Committee Ballot. Next meeting is scheduled for May 4, 2021.
HGV 5	Hydrogen Refueling Appliances	TSC continues to meet to develop *compact Hydrogen Fueling Systems* (HGV 5.2). TSC meetings are scheduled

		every three weeks for content development. Next meeting is scheduled for May 12, 2021.
HGV 3	Fuel system components for compressed hydrogen gas powered vehicles	TSC continues to meet to develop *Onboard vehicle components for Hydrogen Gas Vehicles* (HGV 3.1). TSC meetings are scheduled every two weeks for content development. Next meeting is scheduled for May 12, 2021.
FC 1	Stationary fuel cell power systems	This is an adoption of IEC 62282-3-100. The Fuel Cell Technical Committee ballot closed with no negative votes. The document is being prepared for publication.

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

Joint meeting with WG 5 on Monday discussed earlier.

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. To find out more details and register, please use this link: https://www.cganet.com/cgaconnect-webinar-setting-the-standard-cga-role-in-hydrogen-revolution-2021/

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
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 5th edition has been published and can be found at https://portal.cganet.com/Publication/Details.aspx?id=G-5.5 Deadline to submit proposed changes for next edition is 03/04/2026. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=26-3

Standard	Current edition	Status
		Heat radiation testing at Chart Industries in New Prague, MN date (spring 2021) 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
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.

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

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

Call for abstracts for workshop in December.

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

No update at this time.

VI. Discussion Topics

Facilitating Deployment **All**

Center for Hydrogen Safety **Nick Barilo**

No updates at this time.

Regulatory Matrix Review and Comment **Karen Quackenbush**

The March 31, 2021 version was provided with today's meeting notice.

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

Permitting and Installation of Hydrogen Fueling Stations

California Station Implementation **Jennifer Hamilton**

Studio City station has opened from FirstElement Fuel.

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

Sampling and analysis is continuing throughout the state.

Also monitoring the heavy-duty sector to be prepared for sampling and analysis when the market is more widespread.

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

No updates at this time.

VII. Open Discussion & Other Issues

Bob Boyd discussed the APRR Corridor Lower Boundary requirement in SAE. NREL report on this topic here - https://www.nrel.gov/docs/fy14osti/58564.pdf. Will add to the agenda for next month.

Mark Siira asked the group if there are any current activities pertaining to the codes and standards for data centers and fuel cells. The DOE has engaged in some data center applications.

VIII. Next Meeting – Wednesday, June 2, 2021 at 2:00 PM US Eastern