

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

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

Minutes

Attendees

**Antonio Ruiz
Bob Boyd
Bob Davidson
Chris LaFleur
Christina Daniels
Laura Hill
Mark Duda
Mark Richards
Mark Siira
Morry Markowitz**

**Connor Dolan
Eric Prause
Ian MacIntire
Jay Keller
Jennifer Hamilton
Norman Newhouse
Owen Hopkins
Quailan Homann
Ray Rahaman
Rob Early**

**Jesse Adams
Juana Williams
Karen Quackenbush
Kevin Harris

Kelvin Hecht
Yuk Wong
Spencer Quong
Tommy Rockward
Will James**

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
- Reviewed Agenda
- Approved Minutes with two minor modifications.

II. DOE/HQ Update

Laura Hill

Tomorrow at 4AM US Eastern is an IPHE and Mission Hydrogen webinar, this is in conjunction with the IPHE meeting this week. <https://mission-hydrogen.de/iphe-policy-forum/>

DOE is under a continuing resolution through December 11th at this point.

Jesse Adams has taken on the role at DOE previously held by Fred Joseck. Jesse has been at DOE for 15+ years now, mostly on hydrogen storage and solid oxide research.

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

No updates at this time.

V. Codes and Standards Organization Updates

Institute of Electrical and Electronics Engineers

Mark Siira

We would like to have someone present a 15 minute overview of hydrogen and fuel cell codes and standards at our working group / organization. Our group is made up of several IEEE societies and other stationary power organizations. This would be a good first step in increasing coordination and understanding.

Action Item: FCHEA will follow-up with Mark to discuss specifics.

International Electrotechnical Commission IEC TC 105

Kelvin Hecht

- Standards
 - New Working Group to create a General Safety document to be used by all fuel cell applications
 - Adoption of TC105 standards as National Standards
 - Member countries are to regularly document adoption of TC105 standards and report at each plenary
 - Member countries are to report national sales of adopted TC105 standards
- New work items
 - Accelerated Stress Testing – Italy
 - Railway Applications – China
 - Notebook Applications – Korea
 - Power to methane – Japan
- Support TC22
 - French expert asked TC105 performance experts to assist with conflict within ISO 23828 on Performance Testing Evaluation
- Plenary
 - 2021 Korea
 - 2022 San Francisco

International Standards Organization ISO/TC 197

Karen Quackenbush/Jay Keller

There will be a committee internal ballot (CIB) to poll countries who commented on the scope issue so the document can move to a draft international standard (DIS). This will save time and help draft issues on the scope statement.

There are issues/resolutions to be taken up at the next meeting to expand the scope on basic consideration for hydrogen safety.

The effort on hoses, there is a revision underway however there was an administrative glitch that will require a formal resolution due to timing/framing.

WG 28 which deals with fuel quality issues is also planning to start work on a revision for 19880-8 to be harmonized with the ISO 14687 revision, which is already underway.

Revisiting scope for WG 29 to create a revision to ISO/TR 15916: Basic Considerations for the Safety of Hydrogen Systems. When the WG went out for review liquid hydrogen hazards were not well covered. The WG 29 report at the plenary will address a plan to expand the scope to address other issues that were highlighted during the review and reformatting, which will include a chapter on liquid hydrogen. One of the suggestions on the TR is to restructure or eliminate one of the table. We are working to revisit the safety tables to harmonize with other groups. The community is very vocal that a simplified table may not be the correct choice and a breakdown by application would be a better fit.

There is a joint WG with TC 197 on vocabulary with CEN.

They will also launch the NWIP on heavy-duty fueling. Once the NWIP is approved then the convener will be nominated and presumably will be Antonio Ruiz of Nikola Motors.

National Fire Protection Association NFPA 2

Chris LaFleur

Committee members will vote in January to confirm decisions made at the first draft meeting. There are several task groups that were formed during the meeting that are looking at things like ventilation requirements. These active task groups will be working now through the active comment period which will be next Spring/Summer and the next draft meeting will be next fall.

There was a discussion on a new Task Group to address ground operations for activities such as hydrogen for weather balloons, and possibly to include other aviation operations. A question was raised: Does anything need to be added to the IFC on this? This is early with any standard development and could be included in the next cycle. NFPA 2 and the IFC are always out of cycle. A Task Group is being formed to respond to this topic within NFPA. A placeholder for the current ICC cycle may be warranted, even though the work has not yet been done.

International Codes Council (ICC)

Spencer Quong

Bob Davidson – A hydrogen mobile fueling proposal is being worked through. Should have a final meeting on that in the next week or two. One thing we pushed back on was an arbitrary limit. We used existing vehicles out there now and called for them to be embraced. The size of a unit/trailer will be based on where they have to refuel. Need to be cognizant of parking structures and residential neighborhoods. Should have the Fire Code Committee embrace it.

I am pulling the language from the Fuel Gas Code and reference documents for hydrogen distribution to see what needs to be tinkered with. We will look at what NFPA 2 covers and if an extensive fire code is needed on hydrogen.

On hydrogen and energy storage, does any of that include hydrogen from metal hydrides. Not much – mostly focus on storage as compressed gas or liquid. Both of the interface documents with ISO and SAE contain the interface requirements for those systems. We will include language on that for potential in the future on greater use down the line.

There was a hiccup when they added their fuel cell language. The drafter of their language when it was drafted put it in for 853. The problem was that the gas detection was for indoor systems. We will be doing a proposal as a clarification that this should be expanded for outdoor 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	IEC TC 105 Plenary 2020 was held virtually Nov. 16 and Nov. 17. The US TAG to IEC TC 105 is considering hosting TC 105 Plenary meeting to coincide with 2022 General Meeting in San Francisco. Currently gathering information from ANSI regarding IEC TC 105 funding guidance. Contact: mark.duda@csagroup.org	
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 TSC has completed disposition of public review comments. The draft deviations are out for ballot to the H ₂ TTC. Closes 12/17/2020.
HGV 2	Compressed hydrogen gas vehicle fuel containers	The TC ballot has closed, however a negative vote requires a Recirculation ballot to the H ₂ TTC. Closes 12/11/2020.
HPRD 1	Thermally activated pressure relief devices for compressed hydrogen vehicle fuel containers	Industry/public review is in progress. Closes 12/16/2020. <i>Click here to access the draft:</i> https://publicreview.csa.ca/Home/Details/3961
HGV 4.10	Fittings for use in compressed gaseous hydrogen fuelling stations	H ₂ TTC ballot closed with no negative votes. Comments were addressed by TSC, and TC chair. The document is being prepared for publication.
HGV 4.3	Test methods for hydrogen fueling parameter evaluation	Poll of TSC members shows interest in HGV 4.3 as a certification standard. Draft standard has been sent to TSC members for review and comment with deadline of December 7. <i>TSC Members can click here to access the draft:</i>

		https://community.esagroup.org/docs/DOC-134298
HGV 4.2	Hoses for dispensing compressed gaseous hydrogen	TSC continues to meet to align content with ISO 19880-5, hose standard. The draft will be posted for Public Review this week.
FC 1	Stationary fuel cell power systems	This is an adoption of IEC 62282-3-100. The TSC has completed the disposition of Public review comments. The document is being prepared to be balloted by the CSA Fuel Cell TC.
HGV 5.X	Hydrogen Refueling Appliances	Forming TSC membership now. Project kick-off meeting is today.
HGV 3.1	Fuel system components for compressed hydrogen gas powered vehicles	Project kick-off scheduled for January 2021.

Society of Automotive Engineers (SAE)

Mike Steele

Bob Boyd – In 2601/3 there is a couple of discrepancies as far as definitions of slow/fast fueling. We want to harmonize what is defined in HPIT 2 and NFPA 2 with SAE J2601/3.

Compressed Gas Association (CGA)

Rob Early

CGA continues to work on expanding its scope of support of the hydrogen economy by identifying and filling gaps where appropriate. **The Hydrogen Strategy Task Force has been established and has met three times to focus on long range plans and to identify barriers that must be eliminated.** The Hydrogen Gap Analysis Task Force has met once to identify gaps in CGA’s portfolio of standards and training materials and will meet again in December.

Status of current and future publications:

Standard	Current edition	Status
CGA G-5, <i>Hydrogen</i>	8 th (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, <i>Commodity specification for hydrogen</i>	7 th (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, <i>Standard for hydrogen piping systems at user locations</i>	6 th (2019)	Deadline to submit proposed changes for next edition is 12/22/2024.

Standard	Current edition	Status
		https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-54
CGA G-5.5, <i>Hydrogen vent systems</i>	3 rd (2014)	Next step for 4 th edition is review by CGA Standards Council. Heat radiation testing at Chart Industries in New Prague, MN date is to be determined.
CGA G-5.6, <i>Hydrogen pipeline systems</i>	1 st (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, <i>Service conditions for portable, reversible metal hydride systems</i>	2 nd (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, <i>Guideline for classification and labeling of hydrogen storage systems with hydrogen absorbed in reversible metal hydrides</i>	2 nd (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, <i>Standard for cryogenic hydrogen storage</i>	3 rd (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, <i>Terminology associated with hydrogen fuel technologies</i>	3 rd (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, <i>Standard for bulk hydrogen supply systems</i>	3 rd (2020)	The 3 rd edition has been released. 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, <i>Combustion safety for steam reformer operation</i>	2 nd (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, <i>Safe start-up and shutdown practices for steam reformers</i>	2 nd (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, <i>Mechanical integrity of syngas outlet systems</i>	1 st (2016)	Deadline to submit proposed changes for next edition is 3/1/2022.

Standard	Current edition	Status
		https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=21-016
CGA H-13, <i>Hydrogen pressure swing adsorber (PSA) mechanical integrity requirements</i>	1 st (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, <i>HYCO plant gas leak detection and response practices</i>	1 st (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, <i>Safe catalyst handling in HYCO plants</i>	1 st (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), <i>Small scale hydrogen production and delivery</i>	New publication not released yet	Task force is creating first draft that will then go to the CGA membership for review.
CGA P-28, <i>OSHA process safety management and EPA risk management plan guidance document for bulk liquid hydrogen supply systems</i>	4 th (2014)	The draft of the 5 th edition is in staff review before going to Standards Council for final review.
CGA PS-31, <i>Position statement on cleanliness for proton exchange membranes hydrogen piping / components</i>	1 st (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, <i>Position statement on the use of LPG or propane tanks as compressed hydrogen storage buffers</i>	1 st (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, <i>Position statement on roofs over hydrogen storage systems</i>	1 st (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, <i>Position statement on clarification of existing hydrogen setback distances and development of new</i>	1 st (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
<i>hydrogen setback distances in NFPA 55</i>		

American Society for Testing & Materials (ASTM)

Jennifer Hamilton

No report at this time.

American Society of Mechanical Engineers (ASME)

Ray Rahaman

No report at this time.

VI. Discussion Topics

Facilitating Deployment

All

No updates at this time.

Center for Hydrogen Safety

Nick Barilo

No report at this time.

Regulatory Matrix Review and Comment

Karen Quackenbush

Add link here

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

A new version will be coming out at the end of this month.

Permitting and Installation of Hydrogen Fueling Stations

California Station Implementation

Jennifer Hamilton

No report at this time.

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

We just released a proposed regulation under review right now. This will increase the inspection fees of all devices installed. If anyone wants to comment, you have until December 31, 2020. **Add link here.**

We have slowed down on testing at stations due to fuel supply issues.

Next week we are doing the DMS at a new station in California.

**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, January 6, 2021 at 2:00 PM US Eastern.