

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

**Wednesday, April 7, 2021
TIME: 2:00 – 3:00 pm (Eastern Standard Time)**

Minutes

Attendees

**Amy Ryan
Bob Boyd
Chris LaFleur
Christina Daniels
Connor Dolan
Eric Nelson
Ian MacIntire
Jay Keller
Jennifer Gangi**

**Antonio Ruiz
John Eihusen
Juana Williams
Karen Quackenbush
Kelvin Hecht
Laura Hill
Mark Richards
Mike Steele
Morry Markowitz**

**Norman Newhouse
Quailan Homann
Ray Rahaman
Rob Early
Sara Marxen
Stella Papasavva**

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
- Approved Minutes

II. DOE/HQ Update

Laura Hill

DOE Annual Merit Review is June 7 to 11. Free to register. Will be a virtual event this year.

[H2-Regulatory-Map-Report_SAND2021-2955.pdf \(sandia.gov\)](#) – explores federal regulatory framework for the deployment of hydrogen. Expect to hold a webinar on this announcement in the near-future.

[Subscribe to Hydrogen and Fuel Cells News | Department of Energy](#) – signup for email newsletter from DOE for webinar information and other activities.

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

IWG meeting was held two weeks ago.

Sled test was held for Heavy-Duty vehicles for GTR 13. Results pending EU study on the use of a sled test and other various testing issues.

Permeating criteria requirement for heavy-duty vehicles was reaffirmed at this IWG meeting.

Discharge direction for TPRD vent for heavy-duty vehicles and light-duty vehicles. Have wording but exploring some other issues to revise current text.

Discussed the extension of container service life to include heavy-duty and light-duty vehicles. Container service life currently has an upper limit of 15 years, we want those containers to stay in service longer than that. There is a request to have service life relate to vehicle miles traveled or number of refueling cycles.

Fueling receptacle in GTR 13 does not have consensus. Some do not want a certain design in case there are changes in the future, particularly with 70 mPA heavy-flow nozzle. It is possible it could be changed depending on light vs heavy vehicles.

Test procedures task force and fire test task forces are working on technical details to resolve outstanding issues.

Looked at initial burst pressure requirement for containers. No consensus reached as of yet.

Saw presentations on materials compatibility. Currently no consensus as some do and some do not want to include these requirements.

Task Force 0 drafting activity is taking agreed upon items from previous meetings and putting into markup document of GTR 13. That was presented along with a summary and is now posted on the GTR 13 website. Task Force 0 will continue adding updates as they are available.

V. Codes and Standards Organization Updates

Institute of Electrical and Electronics Engineers

Mark Siira

Mark has reached out to the stationary fuel cell community for interest in potential revisions to IEEE 1547 that may happen for a 2024 edition.

Should you have any concerns on this document, please contact Connor Dolan and Karen Quackenbush.

International Electrotechnical Commission IEC TC 105

Kelvin Hecht

Nothing new to report at this time.

International Standards Organization ISO/TC 197

Karen Quackenbush/Jay Keller

WG 24 has been rescoped. The activity is in three tasks – define what a refueling protocol needs to do, communications, and develop a refueling protocol for high-flow. The WG had its first full meeting last month and is looking forward to its individual task group activities. Trying to understand how best to maneuver three tasks / three documents within one WG.

There is a task to write a standard for safe ground storage. This has started and failed a couple of times. This latest iteration of the WG is led by John Eihusen Hexagon for the US and Tomioka-San Hysut from Japan. The group is currently defining its scope.

WG 5 – Livio Gambone convener – meeting on May 7th for vehicle connection devices. Call this morning through SAE folks to discuss the same topic.

WG 30 – fuel system components – meeting scheduled for May 27th.

National Fire Protection Association NFPA 2

Chris LaFleur

Ballot and first draft publication were delayed from initial targets coming out of NFPA by a month or two. As a result, there is an extended time for public comments for rebuttals to what others have proposed or what you originally proposed during the public input period. This time is open through June 3rd.

The PI that removed all the extract tags for NFPA 55 that passed in the first verbal vote did not pass the official ballot. NFPA will be bringing the issue of perceived overlap to the standards council when they can get on their agenda.

The report is now available on the NFPA website at <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=2>.

International Codes Council (ICC)

Spencer Quong

Committee action hearings are starting next week and run on for ten days. The various proposals would be presented to the Committee action group. This is essentially the first ballot.

Two proposals of interest, one on mobile fueling and another on simple clarification of indoor displays of vehicles with alternative fuels.

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. A first ballot of the H ₂ TTC closed with a negative vote regarding the breakaway device separation value. A TSC meeting was held to discuss the concern and the TSC agreed to revise the deviation (see below). The second ballot of the H ₂ TTC passed. The document is being prepared for publication.
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	The HPRD 1 document published in March 2021.
HGV 4.10	Fittings for use in compressed gaseous hydrogen fueling 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 for April 9 to continue 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. Industry/public review closed.
HGV 5.2	Hydrogen Refueling Appliances	TSC continues to meet to develop <i>compact Hydrogen Fueling Systems</i> (HGV 5.2). TSC meetings are scheduled every three weeks for content development. Next meeting is scheduled for April 21, 2021.
HGV 3	Fuel system components for compressed hydrogen gas powered vehicles	TSC continues to meet to develop <i>Onboard vehicle components for Hydrogen Gas Vehicles</i> (HGV 3.1). TSC meetings are scheduled every two weeks for content development. Next meeting is scheduled for April 14, 2021.
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.

FC 5	Hydrogen generators using fuel processing technologies – Part 1: Safety	We published the US adoption of ISO 16110-1:2007 as CSA/ANSI FC 5:2021 – (<i>Adopted ISO 16110-1:2007, first edition, with US deviations</i>)
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Society of Automotive Engineers (SAE)

Mike Steele

A call was held this morning on J2600 to discuss a 350-bar high-flow vehicle nozzle. The group discussed the ability of this nozzle to connect to other receptacles. A WG 5 meeting will be held next month on the same issue.

A standards meeting is planned for some time in late April.

Compressed Gas Association (CGA)

Rob Early

CGA now has reciprocal membership with FCHEA and the CAFCP.

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 will follow at the next web conference.

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. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-54
CGA G-5.5, <i>Hydrogen vent systems</i>	3 rd (2014)	The 4 th 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, <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

Standard	Current edition	Status
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 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. 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.

Standard	Current edition	Status
		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 hydrogen setback distances in NFPA 55</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

Thermal radiation testing is still planned for this Spring once weather improves. Should have more details on the next meeting.

American Society for Testing & Materials (ASTM)

Jennifer Hamilton

ASTM will be hosting an in-line hydrogen fuel analyzers workshop. Here is the official call for presentations <http://www.astm.org/D03WorkshopHydrogenDec2021>.

American Society of Mechanical Engineers (ASME)

Ray Rahaman

B31.12 – just had march meeting on the 24th. Have a few working items that are now on the way. A few other board approved items are going to be added to the next standard. These will be relayed at the next meeting once we have a date.

VI. Discussion Topics

Facilitating Deployment

All

Center for Hydrogen Safety

Nick Barilo

Webinar coming up on April 29th on safety of water electrolysis equipment. Have 350 registrations. Will be led by Larry Moulthrop.

<https://www.aiche.org/academy/webinars/safety-water-electrolysis>

Regulatory Matrix Review and Comment

Karen Quackenbush

The latest version of the matrix was published last week.

<https://static1.squarespace.com/static/5668416ddc5cb4375e2a9ef8/t/60748b63f260ea032a4ec883/1618250596268/FCHEA+Regulatory+Matrix+markup+March+31+2021.pdf>

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

No updates at this time.

California Div. of Measurement Standards/Fuel Quality / Metrology

 Christina Daniels

Some electric vehicle supply equipment standards were just published. Two devices are out on loan to test electric charging stations in the state. There is also a new rulemaking for inspection and fees of all devices in the state which is in the 30 day review period upon which the new fee will take effect.

Legal Metrology Standards Hydrogen Fuel Quality and Measurement

Juana Williams/Ralph Richter

No updates at this time.

VII. Open Discussion & Other Issues

OSHA activity has been taken up within FCHEA to review regulations related to hydrogen. This activity is just starting and has been populated. If you are interested in this topic, please let us know.

VIII. Next Meeting – Wednesday, May 5th at 2:00 PM US Eastern.