

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

**Wednesday, September 6, 2023
TIME: 2:00 PM ET**

Minutes

**Andrew Adkins
Christina Daniels
Connor Dolan
Rob Early
Brian Ehrhart
Mark Fasel
Mike Force
Jennifer Gangi
Jennifer Hamilton
Tobais Hanson
Kelvin Hecht**

**Laura Hill
Shinichi Hirano
Owen Hopkins
Will James
Jay Keller
Ian MacIntire
Sara Marxen
Norm Newhouse
Haboon Osmond
Eric Prause
Karen Quackenbush**

**Amy Ryan
Kelvin Sumba
Audrey Tu
Svetlana Ulemek
Christine Watson
Juana Williams
Frank Wolak
Yuk Wong
Jason**

I. Welcome and Housekeeping Items

- a. The NHFCCSCC reviewed FCHEA's Anti-trust Guidelines, approved previous minutes, and approved the meeting agenda.

II. DOE/HQ Update

Christine Watson

- **Recording of Stakeholder Webinar on the U.S. National Clean Hydrogen Strategy and Roadmap is Now Available:** leaders from the White House, DOE, and other federal agencies discussed plans for implementing the U.S. National Clean Hydrogen Strategy and Roadmap. During the webinar, Deputy National Climate Advisor Mary Frances Repko announced the launch of the groundbreaking Hydrogen Interagency Task Force (HIT), a collaboration among U.S. federal agencies to ensure a whole-of-government approach to advancing the production and use of clean hydrogen. The HIT will leverage the strengths and capabilities of the entire U.S. government to develop technologies, implement policies, and overcome remaining barriers to the clean hydrogen economy. [Hydrogen Stakeholder Webinar: National Clean Hydrogen Strategy and Roadmap and Interagency Coordination | Department of Energy](#)
- As part of the Bipartisan Infrastructure Law Technology Commercialization Fund, the U.S. Department of Energy (DOE) Office of Technology Transitions (OTT), Office of Clean Energy Demonstrations (OCED), and Office of Energy Efficiency and Renewable Energy (EERE), in collaboration with ENERGYWERX, is offering its **Clean Energy Demonstration Project Siting/Permitting Support Voucher Opportunity (VO-3)** to eligible AHJs to understand new clean energy technology benefits and challenges, evaluate siting and permitting best practices developed by similar jurisdictions, develop streamlined permitting processes, and support community engagement on related issues. The ultimate goal is to increase adoption readiness of new clean energy technologies with a focus on challenges related to license to operate. [Voucher Opportunity 3 – Clean Energy Demonstration Project Siting/Permitting Support \(OCED/EERE\)](#)

- DOT PHMSA is planning an R&D forum (<https://www.federalregister.gov/documents/2023/08/07/2023-16802/pipeline-safety-pipeline-safety-research-and-development-forum>) and (<https://primis.phmsa.dot.gov/meetings/MtgHome.mtg?mtg=166>) on October 31-November 1, 2023 at the Westin Hotel in Crystal City, VA (1800 Richmond Highway, Arlington, VA 22202) and would like to invite you to participate in the forum. The forum will be an excellent opportunity for participants to interact with PHMSA and other federal representatives, industry experts, and other members of academia, small businesses, and other stakeholders. Working Group #2 is on Hydrogen Pipelines.

III. Codes & Standards Events and Fuel Cell Safety Information Karen Quackenbush

- Calendar of events: <https://www.hydrogenandfuelcellsafety.info/safety-report-calendar>
- Any committee members with materials they would like hosted on the website can send them to Karen Quackenbush (kquackenbush@fchea.org) or Haboon Osmond (hosmond@fchea.org).

IV. Global Technical Regulations Ian MacIntire

- GTR 13 Phrase 2 is now posted: <https://unece.org/transport/standards/transport/vehicle-regulations-wp29/global-technical-regulations-gtrs>

V. Codes and Standards Organization Updates

Institute of Electrical and Electronics Engineers Mark Siira

- The revision process for the 2027 edition of IEEE 1547 continues.

International Electrotechnical Commission IEC TC 105 Kelvin Hecht

- New Work Proposal
 - Fuel Cell Power System for propulsion and auxiliary power in maritime applications
- Call for Convenors (chair)
 - Forklifts – safety
 - Forklifts – performance
- SOFC Single Cell & Stack performance
 - CD posted for 2nd edition
- 2023 TC105 Plenary – Paris November 13-17
 - A draft agenda is available

International Standards Organization ISO/TC 197 Karen Quackenbush

- WG 22 (Gaseous hydrogen fueling station hoses) is working on revising ISO 19880-5 (Gaseous hydrogen — Fuelling stations — Part 5: Dispenser hoses and hose assemblies).
 - WG 22 met on July 14th to request to relaunch the project. A ballot to relaunch the project was sent, and it passed. The CD draft has been submitted.

- TC 197 and SC 1 Plenary will meet in Vienna, Austria, from November 13th to November 17th.
- **WG 24** (*Gaseous hydrogen – Fuelling protocols for hydrogen-fuelled vehicles*) includes 3 projects to develop IS related to General Fueling Protocol Requirements (19885-1), Communications (19885-2) and Heavy Duty Fueling Protocol (19885-3). Convenor is Antonio Ruiz. The -1 project is at DIS ballot and closes mid-September. The ballots to cancel the -2 and -3 projects were approved. TC 197 Technical Advisory Board is reviewing the project restart documentation for these. A meeting of the TAB is planned for 9/8 to review and discuss next steps with this WG.
- **WG 18** (*Gaseous hydrogen land vehicle fuel tanks and TPRDs*) is developing 2 IS related to Containers (19881) and PRDs (19882). Convenor is Livio Gambone. The WG is reviewing CD comments in anticipation of DIS ballot planned for early November.

National Fire Protection Association NFPA 2

Chris LaFleur

- NFPA Technical Committee on Hydrogen Technology (HYD-AAA) had its NFPA 2 Pre-First Draft Meeting on July 18th
- The 2023 edition of NFPA 2 is open for public input until January 4th, 2024
- All the hydrogen requirements will move from NFPA 55 to NFPA 22

International Codes Council (ICC)

Mark Fasel

- The Hydrogen Fuel Gas WG's goal is to move forward all proposals to the ICC plumbing and mechanical fuel gas code action committee no later than October.
- The deadline for proposal submissions for the 2027 edition of the international codes depends on the code group.
 - Code A deadline is January 8th, 2024.
 - Code B deadline is January 10th, 2025.
- The Hydrogen Fuel Gas WG will meet September 7th from 12:00 PM – 2:00 PM US Eastern Time.

Society of Automotive Engineers (SAE)

Mike Steele

Task Force	Document	*	Title	Date	Status
Interface	J2600_201510	S	Compressed Hydrogen Surface Vehicle Fueling Connection Devices	21-Oct-15	Being revised in conjunction with ISO 17268
Interface	J2601_202005	S	Fueling Protocols for Light Duty Gaseous Hydrogen Surface Vehicles	29-May-20	Being revised
Interface	J2601/4	TIR	Ambient Temperature Refueling	21-Nov-16	Comment reconciliation under way
Interface	J2799_201912	S	Hydrogen Surface Vehicle to Station Communications Hardware and Software	13-Dec-19	Being revised
Interface	J2601/5	TIR	MC Formula High Flow General (MCF-HF-G) <i>(title may change)</i>	1-Jul-22	Draft posted
Safety	J1766_201401	RP	Recommended Practice for Electric, Fuel Cell and Hybrid Electric Vehicle Crash Integrity Testing	10-Jan-14	Revised - Action required. Awaiting GTR 13 Phase 2
Safety	J2990/1_201606	RP	Gaseous Hydrogen and Fuel Cell Vehicle First and Second Responder Recommended Practice	3-Jun-16	Meeting scheduled to address comments
Safety	J3294	TIR	Guidance for Material Selection for use in Hydrogen Systems	20-Apr-23	FCSC voting in process
Fuel Economy	J2572_201410	RP	Recommended Practice for Measuring Fuel Consumption and Range of Fuel Cell and Hybrid Fuel Cell Vehicles Fueled by Compressed Gaseous Hydrogen	16-Oct-14	Voting in process

CSA

Sara Marxen

Technical Committee Meetings		
<ul style="list-style-type: none"> CSA Group's U.S. Committee Week is planned for October 2-5 in Cleveland, Ohio. CSA Committee Week 2023 		
Active Projects		
TSC	Designation/Title	Status
HGV 5	HGV 5.2, Compact hydrogen fueling systems	This project is to develop a NEW standard for Compact Hydrogen Fueling Systems (HGV 5.2). Working with the TC and TSC Chairs to disposition ballot comments. A second ballot is being planned.
HGV 5	HGV 5.1, Residential hydrogen fuelling appliances	This project is to develop a NEW standard for Residential fueling appliances. Project was kicked off in October. Content development continues.
HGV 4.1	HGV 4.5, Priority and sequencing equipment for hydrogen vehicle fueling	This project is to develop a standard to REINSTATE an updated edition of a Priority and Sequencing standard. Draft document is being prepared to publish.
HGV 4.3	HGV 4.3, Test methods for hydrogen fueling parameter evaluation	This project is a revision of an existing standard. Document has been revised for use as a certification document and is at public review (closing date October 8). https://publicreview.csa.ca/Home/Details/5030
B107	Enclosed Hydrogen Equipment	Work has begun on a new standard that will address safety requirements related to hydrogen equipment use inside an enclosure. Contact Mark Duda (mark.duda@csagroup.org) with questions or for additional information.

FC 6	Fuel cell/water electrolysis module	CSA Group is developing the first edition of the binational CSA FC 6 * C22.2 No. 62282-2-100 – Fuel Cell Technologies – Part 2-100: Fuel cell modules – Safety (IEC 62282-2-100, MOD). This project will be adopting IEC 62282-2-100 - Fuel Cell Technologies – Part 2-100: Fuel cell modules – Safety for US and Canada. The committee will be expanding the scope of the adoption to include water electrolysis modules including cell stacks as the requirements will be similar to fuel cell modules and there is an immediate industry need for a water electrolysis module safety standard. Contact Mark Duda (mark.duda@csagroup.org) with questions or for additional information.
SPE-701	SPE-701 – Hydrogen fuel storage containers for aviation applications	The project is to develop a new document for requirements and recommendations for the material, design, manufacture, marking, and testing of serially produced, refillable hydrogen fuel storage containers intended only for the storage of compressed hydrogen gas or liquid hydrogen fuel for aviation applications. Contact Mark Duda (mark.duda@csagroup.org) with questions or for additional information.

Compressed Gas Association (CGA)

Rob Early

Updates from last month's report are highlighted.

Status of current and future publications:

Standard	Current edition	Status
CGA G-5, <i>Hydrogen</i>	8 th (2017)	The ANS committee has resolved all proposed changes. Next step is a 45 day public review. https://portal.cganet.com/WorkItem/Details.aspx?id=22-019
CGA G-5.3, <i>Commodity specification for hydrogen</i>	7 th (2017)	Deadline to submit proposed changes for next edition was 5/1/2023. A total of 7 PCs have been submitted. A PC resolution meeting is scheduled for 18 August 2023, 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)	Deadline to submit proposed changes for next edition is 03/04/2026. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=26-3 The task force will meet 19 and 20 October 2023 to review test results.

Standard	Current edition	Status
CGA G-5.6, <i>Hydrogen pipeline systems</i>	1 st (2005 – reaffirmed 2013)	Deadline to submit proposed changes for next edition is 8/1/2023. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=19-018
CGA H-3, <i>Standard for cryogenic hydrogen storage</i>	3 rd (2019)	This publication is in staff review prior to Council Ballot. After council approval, H-3 will be sent for 45 day public review after council approval to move through the ANS process.
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. However, all the content has been added to the updated version of CGA G-5. Once CGA G-5 has been issued, CGA H-4 will be retired. For updates use the following link: 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 6/1/2023. 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)	Council ballot due 21 Aug 2023, IHC Association approvals due 18 Sept 2023. Pending no comments, estimated publish date by the end of September. 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

Standard	Current edition	Status
CGA H-17, <i>Small scale hydrogen production and delivery</i>	New publication not released yet	Council ballot due 9 Aug 2023, IHC Association approvals due 7 Sept 2023. Pending no comments, estimated publish date by the end of September. https://portal.cganet.com/WorkItem/Details.aspx?id=18-093
CGA P-28, <i>OSHA process safety management and EPA risk management plan guidance document for bulk liquid hydrogen supply systems</i>	5 th (2022)	Deadline to submit proposed changes for next edition is 08/01/2027. https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-49
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)	The ad hoc committee will meet on 8 August 2023 to resolve public comments and update PS-46. For updates see the link below: https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-012
CGA PS-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)	The ad hoc committee will meet on 8 August 2023 to resolve public comments and update PS-48 to point to NFPA 2 for hydrogen instead of pointing to NFPA 55. For updates see the link below: https://portal.cganet.com/WorkItem/Details.aspx?id=21-062
PS-69, <i>Liquid Hydrogen Supply Systems Separation Distances</i>	1 st (2022)	CGA has developed a position statement pointing users to the new liquid hydrogen system distances in NFPA 2:2023. The position statement covers the process of requesting a variance to use the numbers from the NFPA 2 section of the NFPA web site. PS-69 is free for downloading at https://www.cganet.com/wp-content/uploads/PS-69_1.pdf
CGA work item 21-127, <i>Transfer and unloading of hydrogen at near-consumer use points</i>	New publication not released yet	Develop a new standard to update traditional hydrogen delivery practices for industrial users to improve practices for retail applications.

Standard	Current edition	Status
CGA work item 21-128, <i>Noise from hydrogen venting and hydrogen systems operations</i>	New publication not released yet	Develop a new standard to reduce the noise from hydrogen system operations, including venting, particularly at retail applications where hydrogen system noise is greater than ambient noise. The task force held a meeting November 1 and is working on developing content for the publication.
CGA work item 22-107, <i>Hydrogen system best practices</i>	New publication not released yet	Develop a new standard to capture recommended best practices for handling hydrogen, filling containers, starting up systems, maintaining hydrogen systems, and similar topics to ensure safe practices for those new to the hydrogen space and to share best practices with those already experienced with hydrogen. The first draft is out for a two-month membership review with a cutoff date of 15 August 2023. For updates see the link below: https://portal.cganet.com/WorkItem/Details.aspx?id=22-107
CGA work item 22-116, <i>Hydrogen separation distances</i>	New publication not released yet	CGA is developing a globally harmonized standard on the methodology for developing separation distances between hydrogen systems and exposures. The standard will provide details on mitigation techniques for reducing required distances, particularly in near-consumer locations (such as vehicular fueling) where room is limited. The working group has a first outline and continues to add content. The JWG met on 5 April 2023, 4 May 2023, 18 May 2023, and 8 June 2023. Future meetings are scheduled for 7 July 2023, 30 August 2023, 29 September 2023, and 27 October 2023.
CGA work item 22-127, <i>Hydrogen education plan</i>	New publication not released yet	CGA is developing a globally harmonized standard on hydrogen emergency response and safe hydrogen handling training. The JWG met on 17 April 2023, 11 May 2023, and 9 June 2023. Future meetings are scheduled for 27 June 2023, 8 August 2023, and 15 September 2023.

Upcoming events:

CGA is working on a hydrogen seminar for 17-18 October 2023 with support from CGA members and partners.

CGA has established a new hydrogen membership category for those interested in hydrogen activities and not the whole range of industrial gases. The new membership category has a lower fee structure. More details can be found at <https://www.cganet.com/cga-announces->

[formation-of-hydrogen-membership/](#) . Those who are interested are encouraged to review the material at the CGA web site and/or contact Rob Early at rearly@cganet.com .

CGA has launched <https://www.safehydrogenproject.org/> to grow awareness and access to standards and safety information. More details can be found at <https://www.cganet.com/compressed-gas-association-announces-landmark-hydrogen-initiative/>

American Society for Testing & Materials (ASTM)

Christina Daniels

- ASTM D03.14 Hydrogen and Fuel Cells had 2 ballot close 8/31/2023
 - Revision of D7676 Standard Practice for Screening Organic Halides Contained in Hydrogen or Other Gaseous Fuels – Passed with 0 negatives and 2 editorial comments
 - Withdrawal of D7649 Standard Test Method for Determination of Trace Carbon Dioxide, Argon, Nitrogen, Oxygen and Water in Hydrogen Fuel by Jet Pulse Injection and Gas Chromatography/Mass Spectrometer Analysis – Passed with 0 negatives and 0 comments
- Next steps – both standards move to a D03 main committee ballot
- ASTM D03.14 Hydrogen and Fuel Cells will have a ballot opening in the next month.
 - D7653 Standard Test Method for Determination of Trace Gaseous Contaminants in Hydrogen Fuel by Fourier Transform Infrared (FTIR) Spectroscopy – balloting the results of an interlaboratory study for addition to the standard

ASTM D7606 Standard Practice for Sampling of High Pressure Hydrogen and Related Fuel Cell Feed Gases continues to have monthly meetings.

[Registration](#) for the December committee meeting is open. The meeting is in New Orleans, LA from December 5-6 with the [Workshop on Natural Gas Blended with Hydrogen: Analytic Challenges and Standardization](#) occurring December 6 from 1:00 – 5:30 p.m. local time.

American Society of Mechanical Engineers (ASME)

Ray Rahaman

- ASME BPVC Section 8
 - Fuel cells were taken out of the code case, but a task group has been formed to include industry experts and committee members to continue the dialogue, better understand the technologies, and evaluate whether any changes are needed to the code case.
 - The task group will meet on Thursday, September 28th, for 2 hours (time TBD)

VI. Discussion Topics

Center for Hydrogen Safety

Jennifer Hamilton

- None.

Regulatory Matrix Review and Comment

Karen Quackenbush

- This Matrix is updated quarterly and keeps FCHEA members up-to-date in the development of codes, standards, and regulations.
- As of June 30, 2023:
<https://static1.squarespace.com/static/5668416ddc5cb4375e2a9ef8/t/64a5c9213a13>

[167fb28acb40/1688586529543/FCHEA+Regulatory+Matrix+Markup+June+30+2023.pdf](https://www.fchea.org/167fb28acb40/1688586529543/FCHEA+Regulatory+Matrix+Markup+June+30+2023.pdf)

- Please direct any updates, questions, or comments to Karen Quackenbush via email at kquackenbush@fchea.org or Haboon Osmond at hosmond@fchea.org.
- H2Tools’ Hydrogen and Fuel Cell Codes and Standards [database](#).

California Station Implementation

Ben Xiong

- 54 open retail stations (down from 59)
 - 5 stations changed from “Open-Retail” to “Currently Available” ([more info](#))
- HRS opened YTD 2023: 1
 - San Diego – Mission Center Rd. (May 2023)
- 29 stations in development
- 10 HRS currently unavailable
 - True Zero Los Angeles-LAX, Palo Alto, Anaheim
 - Shell Berkeley, Citrus Heights, Sacramento, San Francisco – 3rd St., San Francisco – Harrison St.
 - Cummins Ontario
 - Cal State LA
- 6 HRS in commissioning
 - Iwatani Anaheim
 - Iwatani Corona
 - Iwatani La Mirada
 - Iwatani Santa Ana
 - HTEC Woodside
- Light duty FCEVs sold and leased in US: [17,284](#)

California Div. of Measurement Standards/Fuel Quality / Metrology

Yuk Wong

- Sampling has been cut down due to hydrogen supply disruption in Southern CA. Once the issue is resolved and stations are up and running, DMS will continue the sampling routine.

Legal Metrology Standards Hydrogen Fuel Quality and Measurement

Juana Williams

The final reports of decisions made during the July 30 – August 3, 2023 108th National Conference on Weights and Measures (NCWM) Annual Meeting in Norfolk, VA are planned for publication in the October/November 2023 timeframe. Items appearing in the 2023 final report as adopted and those carried over to appear along with new proposals for hydrogen-gas-measuring device legal metrology requirements on 2024 agendas are outlined in the table below:

NCWM Committee	Committee Agenda Item Status, No., Title	Submitter’s Stated Purpose	Proposed Modification to the NIST Handbook Code	NCWM Agenda Item Status
2024 Specifications and Tolerances (S&T)	Developing HGM-23.1 UR.3.8. Safety Requirement	Add safety requirement for hydrogen gas measuring devices to NIST Handbook 44 Section 3.39.	Add a new user requirement paragraph UR. 3.8. to read: <u>UR.3.8 Safety Requirement – All hydrogen gas-</u>	The Committee made this proposal a developing item requesting additional information on the proposed new safety requirement.

NCWM Committee	Committee Agenda Item Status, No., Title	Submitter's Stated Purpose	Proposed Modification to the NIST Handbook Code	NCWM Agenda Item Status
			<p><u>measuring devices subject to this code shall maintain verification of testing demonstrating conformance with the latest version of SAE J2601 Fuel Protocols for Light Duty Gaseous Hydrogen Surface Vehicles, as determined by the latest version of ANSI/CSA HGV 4.3 "Test Methods for Hydrogen Fueling Parameter Evaluation. (Nonretroactive as of January 1, 20XX)</u></p>	<p>NIST Handbook 44 includes legal metrology requirements and does not include safety requirements. California has indicated SAE J2601 is more than a safety requirement because it is also a performance requirement applied to its public stations. The submitter has indicated the dispenser's fueling protocol can harm test equipment. The Submitter acknowledges that handbooks do not address safety and requested informational status and that the proposal undergo further development.</p> <p>The S&T Committee has requested more information on the metrological effects of the fueling protocol on hydrogen gas vehicle fueling dispensers.</p> <p>No further comments were received during the 31JUL2023-03AUG2023 NCWM Annual Meeting. The NCWM S&T Committee assigned the proposal "Developing" status pending further input from the submitter of the proposal. This proposal appears on the four fall SEP2023-OCT 2023 U.S. regional weights and measures association agendas as a "Developing" Item HGM-23.1.</p>
2024 Laws and Regulations (L&R)	<p>Developing FLR-23.3</p> <p>Section 2.20. Hydrogen Fuel</p>	Add equivalent hydrogen quality standard, ISO 14687 to NIST Handbook 130	Modify Section 2 Standard Specification 2.20 as follows:	Recommended for further development by the submitter of the proposal.

NCWM Committee	Committee Agenda Item Status, No., Title	Submitter's Stated Purpose	Proposed Modification to the NIST Handbook Code	NCWM Agenda Item Status
		Part IV. F. Section 2.20.	<p>2.20. Hydrogen Fuel. – Shall meet the latest version of SAE J2719, “Hydrogen Fuel Quality for Fuel Cell Vehicles.” <u>or ISO 14687</u> <u>“Hydrogen fuel quality — Product specification”.</u> (Added 2012) <u>(Amended 20XX)</u></p>	<p>Comments were heard recommending the fuel quality standard include the publication dates for each standard and to specifically cite the relevant part of ISO 14687 which applies for this standard. Additionally, there could be a six-month gap in the revision cycle before the two standards would be completely aligned.</p> <p>Based on these points the Committee agreed there remains concern about the confusion that would result from citing two fuel quality standards instead of one.</p> <p>On review of these comments the Committee assigned the proposal “Developing” status and requested the submitter to determine which standard is appropriate to resolve the issues resulting from having two standards and update the Committee.</p> <p>On May 8, 2023 the submitter indicated that the standards organizations work to coordinate their updates occurs after one is updated then work begins to harmonize the other standard. Consequently, the submitter recommended an alternative modification of Section 2.20 to recognize “whichever has the most recent publication date” to read:</p> <p>2.20. Hydrogen Fuel. – Shall meet the latest</p>

NCWM Committee	Committee Agenda Item Status, No., Title	Submitter's Stated Purpose	Proposed Modification to the NIST Handbook Code	NCWM Agenda Item Status
				<p>version of SAE J2719, "Hydrogen Fuel Quality for Fuel Cell Vehicles." or <u>ISO 14687 Grade (D) "Hydrogen fuel quality – Product specification", whichever has the most recent publication date.</u> (Added 2012) (<u>Amended 20XX</u>)</p> <p>During the NCWM 31JUL2023-03AUG2023 Annual Meeting no further comments were heard and the Committee made no changes to the proposal.</p> <p>This proposal appears on the four fall SEP2023-OCT2023 U.S. regional weights and measures association agendas as a "Developing" Item FLR-23.3.</p>
2023 L&R	<p>Adopted AUG2023 FLR-23.4</p> <p>Section 4.3. Dispenser Filters</p>	<p>Add filter requirements for commercial hydrogen dispensers to NIST Handbook 130 Part IV. F. Section 4.3.</p>	<p>Add a new hydrogen dispenser filter Subsection 4.3.3 as follows:</p> <p><u>4.3.3 Delivery Gas of Hydrogen</u></p> <p>(a) <u>All gaseous hydrogen dispensers shall have a 5 micron or smaller nominal pore-sized filter, and</u></p> <p>(b) <u>Shall be fitted with a coalescing filter that is size appropriate to</u></p>	<p>Proposal had Voting status, recommended for adoption in July 2023. The Committee agreed to the submitter's further modification of the proposal in response to comments indicating the proposed regulation did not address critical filter specifications for the contaminant filter pore size nor specify a type and filter sized appropriately for protecting the vehicle systems from liquid contaminants. The L&R Committee also concurred with recommendations for placing the filter requirements in separate new subsections 4.3.3. Delivery of Hydrogen Gas</p>

NCWM Committee	Committee Agenda Item Status, No., Title	Submitter's Stated Purpose	Proposed Modification to the NIST Handbook Code	NCWM Agenda Item Status
			<p><u>the dispensing system to protect the vehicle from liquid contamination.</u> <u>(Added 20XX)</u></p>	<p>(a) and (b). In May 2023 CWMA heard input that with coalescing type filters the flow rate is more of a factor than the pore size.</p> <p>One additional option proposed in June 2023 for the new liquid filter requirement in Section 4.3.3.(b) was developed by industry to provide further clarity on the filter specification to read:</p> <p><u>(b) Shall be fitted with a suitable coalescing filter which is size appropriate to the dispensing system, and will effectively protect the vehicle from liquid contamination</u></p> <p>This proposal was adopted during the 02AUG2023 NCWM Annual Meeting voting session. The new filter requirement will be published late fall 2023 in the 2024 edition of NIST HB 130.</p>
2024 L&R	<p>New proposal:</p> <p>ITEM BLOCK 2 (B2) REFERENCE ASTM STANDARDS D8080 AND D8487</p> <p>MOS-24.1 2.9. Liquefied Natural Gas (LNG) Vehicle Fuel, 2.10. Compressed Natural Gas (CNG), and 2.XX. Compressed Natural Gas (CNG)</p>	<p>Amend NIST Handbook 130 Part IV. F. Sections 2.9 and 2.10 by replacing SAE J1616 and SAE J2699 with ASTM D8080 "Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel."</p>	<p>Modify Section 2.9 and 2.10 as follows:</p> <p>2.9. Liquefied Natural Gas (LNG) Vehicle Fuel. – Shall meet the latest version of SAE J2699, "Liquefied Natural Gas (LNG) Vehicle Fuel." <u>ASTM D8080 "Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel."</u></p>	<p>The submitter of the proposal has indicated the following justification for modifying these fuel quality standards:</p> <p>ASTM D8080 is intended for natural gas vehicle fuels that have no additional hydrogen blend in the fuel. The specification establishes performance grades based on the fuel resistance to engine knock, energy content, and sulfur levels.</p>

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	Blended with Hydrogen	<p>Amend NIST HB 130 F. Uniform Fuels and Automotive Lubricants Regulation Section 2 by adding a new paragraph for ASTM D8487 "Standard Specification for Natural Gas, Hydrogen Blends for Use as a Motor Vehicle Fuel."</p> <p>Amend NIST HB 130 F. Uniform Fuels and Automotive Lubricants Regulation Sections 3.10 CNG and 3.11 LNG by adding labeling of grades to the method of sale for CNG and LNG.</p>	<p>2.10. Compressed Natural Gas (CNG). – Shall meet the latest version of SAE J1616, "Recommended Practice for Compressed Natural Gas Vehicle Fuel." <u>ASTM D8080 "Standard Specification for Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Used as a Motor Vehicle Fuel."</u></p> <p>Include a new fuel quality requirement for CNG and hydrogen blended products:</p> <p><u>2.XX. Compressed Natural Gas (CNG) Blended with Hydrogen. – Shall meet the latest version of ASTM D8487 "Standard Specification for Natural Gas, Hydrogen Blends for Use as a Motor Vehicle Fuel."</u></p>	<p>ASTM D8487 is intended for natural gas vehicle fuels that have additional hydrogen blended in the fuel. The specification covers natural gas fuels that have been blended with hydrogen and establishes performance grades based on the fuel resistance to engine knock, energy content, and sulfur levels. This specification is to be used in locations where hydrogen is being blended into the natural gas supply. This will become increasingly important as the natural gas supply has hydrogen blended to meet the decarbonization efforts of the US.</p> <p>Both these standards are applicable at the point of dispensing into the vehicle fuel tank.</p> <p>This proposal will require dispensers to be labeled with the product grade. This will require the product composition to be determined.</p> <p>The submitter requested that the status be "Developing".</p> <p>This proposal is a new for the 2024 cycle and will appear for the first time on the four fall SEP2023-OCT2023 U.S. regional weights and measures associations agendas.</p>

The schedule for the upcoming meetings of the four U.S. regional weights and measures associations and NCWM Specifications and Tolerances Committee and Laws and Regulations Committee addressing proposals for hydrogen codes and regulations during the 2024 Weights and Measures Standards Development Cycle (SEP2023-JUL2024) are shown below. Current editions of the 2023 NIST Handbooks are available on the NIST OWM website at: <https://www.nist.gov/pml/owm/owm-products-and-services/publications-and-documentary-standards>. The 2024 editions of the handbooks are currently under review for publication later this year.

Comments on these proposals are encouraged and can be provided in-person or in writing or electronically to the chairperson of the Committee addressing these proposals up through January 10, 2024 during the NCWM Interim Meeting in New Orleans, LA.

2023 CWMA Interim Meeting | September 11-14, 2023 | Dubuque, Iowa

2023 WWMA Annual Meeting | September 17 - 21, 2023 | Sparks, NV

2023 SWMA Annual Meeting | October 8th-11th, 2023 | Annapolis, Maryland

2023 NEWMA Interim Meeting | October 16th-19th | Norwich, Connecticut

(Regional meeting information is available on the NCWM website at: <https://www.ncwm.com/> under the NCWM logo scroll over MEETINGS and in the REGIONS drop down box click on the region of interest.

2024 NCWM Interim Meeting (<https://www.ncwm.com/>)

January 7-10, 2024 | Royal Sonesta New Orleans | New Orleans, Louisiana

If you have questions or comments regarding these handbook proposals, the NIST USNWG or NIST OWM's work on hydrogen projects in the areas of device standards, test procedures, or hydrogen fuel specifications, please contact Juana Williams by email at: juana.williams@nist.gov or by telephone at (301) 975-3989.

VII. Open Discussion & Other Issues

- a. The accident involving the fueling of a hydrogen car was discussed. ISO WG 5 is researching the issue to determine what happened and mitigation methods.

VIII. Next Meeting – Wednesday, October 11th at 2:00 PM US Eastern Time