

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

**Wednesday, April 5, 2023  
TIME: 2:00 PM EDT**

**Minutes**

**Attendees**

**Victoria Ammermann  
Christina Daniels  
Connor Dolan  
Brian Ehrhart  
Mark Fasel  
Jennifer Gangi  
Kelvin Hecht  
Martin Hering  
Laura Hill  
Shinichi Hirano  
Owen Hopkins**

**Ian MacIntire  
Sara Marxen  
Norm Newhouse  
Douglas Olenick  
Haboon Osmond  
Eric Prause  
Karen Quackenbush  
Carl Rivkin  
Amy Ryan  
Matt Sigler  
Mike Steele**

**Svetlana Ulemek  
Christine Watson  
Trey White  
Juana Williams  
Frank Wolak  
Yuk Wong**

**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**

- Regional Clean Hydrogen Hubs FOA: Submission Deadline for Full Applications is 4/7/2023 5:00pm ET. All questions can be directed to [h2hubs@hq.doe.gov](mailto:h2hubs@hq.doe.gov)
- Bipartisan Infrastructure Law: Clean Hydrogen Electrolysis, Manufacturing, and Recycling FOA issued. Concept paper deadline 04/19/2023 5:00pm ET. [EERE eXCHANGE: Funding Opportunity Exchange \(energy.gov\)](https://www.energy.gov/eere-exchange)
  - Area of Interest 1: Clean Hydrogen Electrolysis Program
    - Topic 1: Low Cost, High-Throughput Electrolyzer Manufacturing
    - Topic 2: Electrolyzer Component and Supply Chain Development
    - Topic 3: Advanced Electrolyzer Technology and Component Development
  - Area of Interest 2: Clean Hydrogen Manufacturing and Recycling
    - Topic 4: Fuel Cell Membrane Electrode Assembly and Stack Manufacturing and Automation
    - Topic 5: Fuel Cell Supply Chain Development
    - Topic 6: Recovery and Recycling Consortium:
- Industrial Efficiency and Decarbonization Office (IEDO) FY23 Multi-Topic FOA issued. Concept paper deadline 04/17/2023 5:00pm ET. [EERE eXCHANGE: Funding Opportunity Exchange \(energy.gov\)](https://www.energy.gov/eere-exchange)
  - Topic Area 2: Low-Carbon Fuels Utilization R&D

- Area of Interest 1 – Mitigating H2 Combustion Impacts on Material and Product Quality
- Area of Interest 2 – Developing H2-Based Combustion Systems
- Topic Area 5: Decarbonizing Iron and Steel
  - Area of Interest 3 – Overcoming Challenges Associated with Utilizing Hydrogen in Steelmaking

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

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

### IV. Global Technical Regulations Ian MacIntire

- GTR 13 Phrase 2 has been approved by GRSP. It may be voted on by WP 29 at their June meeting.

### V. Codes and Standards Organization Updates

#### Institute of Electrical and Electronics Engineers

Mark Siira

- IEEE started a 3-day meeting of working groups concerning IEEE 1547. It is in-person in Houston, TX, with a virtual option.

#### International Electrotechnical Commission IEC TC 105

Kelvin Hecht

- TC 105 posted Committee Draft for Vote:
  - IEC 62282-8-201 2<sup>nd</sup> edition *Energy storage systems using fuel cell modules in reverse mode – Test procedures for the performance of power-to power systems*
  - Response due 5/26.
- TC105 posted Final Draft International Standard
  - IEC 62282-8-301 1<sup>st</sup> edition *Energy storage systems using fuel cell modules in reverse mode – Power to methane energy systems based on solid oxide cells including reversible operation – Performance test method*
  - Response was due 3/31.
- The committee updating IEC 62282-3-100, *Stationary Fuel Cell Power Systems – Safety* (4<sup>th</sup> edition), has scheduled an in-person meeting in Frankfurt Germany September 26-28.

#### International Standards Organization ISO/TC 197

Karen Quackenbush

- WG 34 (Hydrogen generators using water electrolysis test protocols and safety requirements) met today.
- WG 24 (Gaseous hydrogen – Fuelling protocols for hydrogen-fuelled vehicles) will meet from June 27<sup>th</sup> to June 29<sup>th</sup> in Versailles, France.
- Regarding WG 22 (Gaseous hydrogen fueling station hoses), the revision work of ISO 19880-5 will stop on May 1<sup>st</sup> and start again when the CD is ready for ballot.

- WG 27 (Hydrogen fuel quality) and WG 28 (Hydrogen quality control) will meet on April 19<sup>th</sup> and 20<sup>th</sup> at 10 PM US Pacific Time
- WG 27, WG 28, and WG 33 (Sampling for fuel quality analysis) will meet on June 13<sup>th</sup> and 14<sup>th</sup> in Oslo, Norway.

**National Fire Protection Association NFPA 2**

**Chris LaFleur**

- Two ballots for technical interim amendments were passed on the following two issues:
  - Incorrect reference in a section regarding sprinkles
  - A need to clarify language in a new section of the 2023 edition regarding hydrogen balloons and unpiloted aircrafts (e.g., weather balloons)

**International Codes Council (ICC)**

**Mark Fasel**

- The Hydrogen Fuel Gas WG will meet on April 20<sup>th</sup>, 2023 from 12:00 PM – 2:00 PM US Eastern Time and from 9:00 AM – 11:00 AM US Pacific Time. The WG will meet every two weeks.
- If any committee members are interested in participating in the WG, please contact Mark Fasel ([mfasel@iccsafe.org](mailto:mfasel@iccsafe.org))

**Society of Automotive Engineers (SAE)**

**Mike Steele**

<i>Task Force</i>	<i>Document</i>	<i>*</i>	<i>Title</i>	<i>Date</i>	<i>Status</i>
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	J2601/2_201409	TIR	Fueling Protocol for Gaseous Hydrogen Powered Heavy Duty Vehicles	24-Sep-14	Project opened 3/31 to Stabilize document
Interface	J2601/4	TIR	Ambient Temperature Refueling	21-Nov-16	Being developed. Anticipate voting on draft 1Q23.
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

<b>Safety</b>	J2990/1_201606	RP	Gaseous Hydrogen and Fuel Cell Vehicle First and Second Responder Recommended Practice	3-Jun-16	WIP - draft posted
<b>Fuel Economy</b>	J3202	RP	Recommended Practice for Measuring and Simulating Fuel Consumption and Range of Heavy-Duty Fuel Cell Hybrid Road Vehicles Fueled by Compressed Gaseous Hydrogen	25-Apr-19	Being developed. No draft posted
<b>Fuel Economy</b>	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	Needs affirmation ballot of existing content

CSA

Sara Marxen

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. Meeting planned for TSC to discuss.
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 2	HGV 2, Compressed hydrogen gas vehicle fuel containers	This project is a revision of an existing standard. Ballot to Technical Committee is expected to start in early April 2023.
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. Public review is open – closing March 27. <a href="https://publicreview.csa.ca/Home/Toc/4855">https://publicreview.csa.ca/Home/Toc/4855</a>
HGV 4.3	HGV 4.3, Test methods for hydrogen fueling parameter evaluation	This project is a revision of an existing standard. A Task Force was put together to develop text to transition from a testing standard to a standard that can be used for certification. The TSC will proceed with this project and discuss lower boundary prior to publication.
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( <a href="mailto:mark.duda@csagroup.org">mark.duda@csagroup.org</a> ) with questions or for additional information.
SPE-701	SPE-701 – Hydrogen fuel storage	The project is to develop a new document for requirements and recommendations for the material, design, manufacture, marking, and testing of serially produced,

containers for aviation applications	refillable hydrogen fuel storage containers intended only for the storage of compressed hydrogen gas or liquid hydrogen fuel for aviation applications. Contact Mark Duda ( <a href="mailto:mark.duda@csagroup.org">mark.duda@csagroup.org</a> ) with questions or for additional information.
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## 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 <sup>th</sup> (2017)	The ANS committee has resolved all propose changes, and the update is moving through the ANSI review process. For updates on the work item progress see <a href="https://portal.cganet.com/WorkItem/Details.aspx?id=22-019">https://portal.cganet.com/WorkItem/Details.aspx?id=22-019</a>
CGA G-5.3, <i>Commodity specification for hydrogen</i>	7 <sup>th</sup> (2017)	Deadline to submit proposed changes for next edition is 5/1/2023. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-013">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-013</a>
CGA G-5.4, <i>Standard for hydrogen piping systems at user locations</i>	6 <sup>th</sup> (2019)	Deadline to submit proposed changes for next edition is 12/22/2024. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-54">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-54</a>
CGA G-5.5, <i>Hydrogen vent systems</i>	3 <sup>rd</sup> (2014)	The 5 <sup>th</sup> edition has been published and can be found at <a href="https://portal.cganet.com/Publication/Details.aspx?id=G-5.5">https://portal.cganet.com/Publication/Details.aspx?id=G-5.5</a> Deadline to submit proposed changes for next edition is 03/04/2026. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=26-3">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=26-3</a> Heat radiation testing at Chart Industries in New Prague, MN date is ongoing. The goal is for the task force to review test results as soon as they are completed.
CGA G-5.6, <i>Hydrogen pipeline systems</i>	1 <sup>st</sup> (2005 – reaffirmed 2013)	Deadline to submit proposed changes for next edition is 8/1/2023. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=19-018">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=19-018</a>
CGA H-3, <i>Standard for cryogenic hydrogen storage</i>	3 <sup>rd</sup> (2019)	The ANS committee has resolved all the proposed changes, including a request to add flow arrows to the flow diagrams. The publication is now moving through the ANSI

Standard	Current edition	Status
		review process. For updates use the following link: <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-036">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-036</a>
CGA H-4, <i>Terminology associated with hydrogen fuel technologies</i>	3 <sup>rd</sup> (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: <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-59">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-59</a>
ANSI/CGA H-5, <i>Standard for bulk hydrogen supply systems</i>	3 <sup>rd</sup> (2020)	The deadline to submit proposed changes for the next edition is 2/26/2024. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-010">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=24-010</a>
CGA H-10, <i>Combustion safety for steam reformer operation</i>	2 <sup>nd</sup> (2018)	Deadline to submit proposed changes for next edition is 12/1/2023. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-038">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-038</a>
CGA H-11, <i>Safe start-up and shutdown practices for steam reformers</i>	2 <sup>nd</sup> (2020)	Deadline to submit proposed changes for next edition is 8/11/2025. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-30">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-30</a>
CGA H-12, <i>Mechanical integrity of syngas outlet systems</i>	1 <sup>st</sup> (2016)	Deadline to submit proposed changes for next edition is 3/1/2023. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=21-016">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=21-016</a>
CGA H-13, <i>Hydrogen pressure swing adsorber (PSA) mechanical integrity requirements</i>	1 <sup>st</sup> (2017)	Deadline to submit proposed changes for next edition is 11/12/2022. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-027">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=22-027</a>
CGA H-14, <i>HYCO plant gas leak detection and response practices</i>	1 <sup>st</sup> (2018)	Deadline to submit proposed changes for next edition is 12/8/2023. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-045">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-045</a>
CGA H-15, <i>Safe catalyst handling in HYCO plants</i>	1 <sup>st</sup> (2020)	Deadline to submit proposed changes for next edition is 9/1/2025. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-59">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-59</a>
CGA H-17, <i>Small scale hydrogen production and delivery</i>	New publication not released yet	Task force has created the first draft that is out for proposed changes; the deadline to submit proposed changes is 12/15/2022. <a href="https://portal.cganet.com/WorkItem/Details.aspx?id=18-093">https://portal.cganet.com/WorkItem/Details.aspx?id=18-093</a>
CGA P-28, <i>OSHA process safety management and EPA</i>	5 <sup>th</sup> (2022)	Deadline to submit proposed changes for next edition is 08/01/2027

Standard	Current edition	Status
<i>risk management plan guidance document for bulk liquid hydrogen supply systems</i>		<a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-49">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-49</a>
CGA PS-31, <i>Position statement on cleanliness for proton exchange membranes hydrogen piping / components</i>	1 <sup>st</sup> (2007 – reaffirmed 2019)	Deadline to submit proposed changes for next edition is 6/12/2025. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-16">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-16</a>
CGA PS-33, <i>Position statement on the use of LPG or propane tanks as compressed hydrogen storage buffers</i>	1 <sup>st</sup> (2008 – reaffirmed 2020)	Deadline to submit proposed changes for next edition is 12/10/2026. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-41">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=25-41</a>
CGA PS-46, <i>Position statement on roofs over hydrogen storage systems</i>	1 <sup>st</sup> (2017)	Deadline to submit proposed changes for next edition is 3/6/2023. <a href="https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-012">https://portal.cganet.com/Publication/Workspace/Outline.aspx?work_id=23-012</a>
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 <sup>st</sup> (2016)	Deadline to submit proposed changes for next edition was 2/12/2021. Standard has been on hold until NFPA 2:2023 has been issued. Now that NFPA 2:2023 has been issued, work will restart on updates to PS-48 to point to NFPA 2 for hydrogen. The ad hoc committee will meet to resolve the changes and move the updated version along for publication. For updates see the link below: <a href="https://portal.cganet.com/WorkItem/Details.aspx?id=21-062">https://portal.cganet.com/WorkItem/Details.aspx?id=21-062</a>
PS-69, <i>Liquid Hydrogen Supply Systems Separation Distances</i>	1 <sup>st</sup> (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 <a href="https://www.cganet.com/wp-content/uploads/PS-69_1.pdf">https://www.cganet.com/wp-content/uploads/PS-69_1.pdf</a>
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.
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

Standard	Current edition	Status
		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. Planned date for the first draft is March 2023. The task force has completed the first draft, which is now going through staff review and then membership review. The task force will meet to resolve comments from staff review.
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 goal is to have the standard released in 2023. The task force is now developing an outline for separation distances development.

**Upcoming events:**

CGA is working on a hydrogen seminar in November 2023 with support from CGA members and partners. More details and a call for papers will be out soon.

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](mailto: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**



Standards	Status
D7606 Sampling of High Pressure Hydrogen	Work group WK85676 was started. Discuss heavy duty sampling and harmonization with ISO 19880-9. Monthly meetings the fourth Thursday of the month at 11:00 a.m. eastern.
D7634 Visualizing Particulate Sizes	Interlaboratory study in progress.
D7651 Gravimetric Measurement of Particulate Concentration	Interlaboratory study required. Looking for a technical expert to lead this effort.
D7653 Gaseous Contaminants in Hydrogen Fuel by FTIR	Interlaboratory study in progress. Looking for funding to purchase the cylinders for the study.
D7675 Total Hydrocarbons in Hydrogen by FID-THC	Interlaboratory study in progress.
D7676 Screening Method for Organic Halides in Gaseous Fuels	Standard open for review.
D7892 Total Organic Halides, Total Non-Methane Hydrocarbons, and Formaldehyde by GC-MS	Interlaboratory study in progress. Looking for funding to purchase the cylinders for the study.
Aviation Hydrogen	Work group WK85474 has been started. Looking for experts to join this group.
Natural Gas, Hydrogen Blends for Use as a Motor Vehicle Fuel	Ballot closed and received one negative.

If anyone would like to join or has any questions about this information, please contact Christina Daniels at [christinadaniels9@gmail.com](mailto:christinadaniels9@gmail.com).

### **ASTM D03 committee will be hosting a Workshop on Natural Gas Blended with Hydrogen: Analytic Challenges and Standardization**

When: December 6, 2023

Where : Sheraton New Orleans Hotel, New Orleans, LA

Abstract Deadline: **April 30, 2023**

Topics for this workshop include:

1. Discussion on existing sampling and analysis of natural gas
2. Identify precision and bias needs and modifications of scopes for current standards
3. Impact of percent levels of hydrogen in natural gas on existing sampling and analysis standards
4. Identify gaps in sampling and analytic methods for natural gas with percent concentrations of hydrogen
5. Identify major concerns and standardization needs
6. Educate stakeholders such as the natural gas industry on the existence and utility of ASTM standards

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

**Ray Rahaman**

- No updates.

## **VI. Discussion Topics**

**Center for Hydrogen Safety****Jennifer Hamilton**

- The CHS Europe conference will be held in Rotterdam, Netherlands, May 9-11, 2023.

**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 December 31, 2022:  
<https://static1.squarespace.com/static/5668416ddc5cb4375e2a9ef8/t/63b7029b035a2d2b4a51609b/1672938139529/FCHEA+Regulatory+Matrix+Markup+December+31+2022.pdf>
- Please direct any updates, questions, or comments to Karen Quackenbush via email at [kquackenbush@fchea.org](mailto:kquackenbush@fchea.org) or Haboon Osmond at [hosmond@fchea.org](mailto:hosmond@fchea.org).

**Permitting and Installation of Hydrogen Fueling Stations**

- No updates.

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

- No updates.

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

- Our rulemaking on Hydrogen Gas-Measuring Devices from last August is still on hold as we are looking to perform a survey of the marketplace.
- Particulate sampling has been put on hold. Samplers had to be sent back to manufacturer. Looking to begin sampling by the beginning of May.
- Christina’s last day with CDFA will be Friday, April 14, 2023. Yuk Wong will be giving the CDFA updates moving forward.

**Legal Metrology Standards Hydrogen Fuel Quality and Measurement** **Juana Williams**

- The final 2023 Interim Meeting Reports (National Conference on Weights and Measures (NCWM) Publication 16) on the status and points considered by the NCWM Committees that addressed the proposals to modify hydrogen gas commercial measurement standards on January 8-11, 2023 will be published in mid-April 2023. Proposals assigned a “Voting” status will be up for adoption at the July 30 - August 5, 2023 108<sup>th</sup> NCWM Annual Meeting in Norfolk, VA. A preliminary report on those proposals is listed in the table below:

<b>NCWM Committee</b>	<b>Committee Agenda Item Status, No., Title</b>	<b>Submitter’s Stated Purpose</b>	<b>Submitter’s Proposed Modification to the Code in the January 2023 NCWM Interim Meeting Agenda</b>	<b><u>Preliminary NCWM Agenda Item Status</u> (Final January 2023 Interim Meeting Report due in mid-April 2023)</b>
Specifications and Tolerances (S&T)	<b>Developing</b> HGM-23.1	Add safety requirement for hydrogen	Add a new user requirement	NIST Handbook 44 includes legal metrology

NCWM Committee	Committee Agenda Item Status, No., Title	Submitter's Stated Purpose	Submitter's Proposed Modification to the Code in the January 2023 NCWM Interim Meeting Agenda	<u>Preliminary NCWM Agenda Item Status (Final January 2023 Interim Meeting Report due in mid-April 2023)</u>
	UR.3.8. Safety Requirement	gas measuring devices.	<p>paragraph UR3.8. to read:</p> <p><b><u>UR 3.8 Safety Requirement –All hydrogen gas-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, 10XX)</u></b></p>	<p>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 station. 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&amp;T Committee has requested more information on the metrological effects of the fueling protocol on hydrogen gas vehicle fueling dispensers.</p> <p>On review of these comments the Committee assigned the proposal “Developing” status.</p>
Laws and Regulations (L&R)	<b>Developing</b> FLR-23.3	Add equivalent hydrogen quality	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	Submitter's Proposed Modification to the Code in the January 2023 NCWM Interim Meeting Agenda	<u>Preliminary NCWM Agenda Item Status (Final January 2023 Interim Meeting Report due in mid-April 2023)</u>
	Section 2.20. Hydrogen Fuel	standard, ISO 14687 to 2.20.	<b>2.20. Hydrogen Fuel.</b> – Shall meet the latest version of SAE J2719, “Hydrogen Fuel Quality for Fuel Cell Vehicles.” <b><u>or ISO 14687 “Hydrogen fuel quality — Product specification”.</u></b> (Added 2012) <b><u>(Amended 20XX)</u></b>	Proposal was further modified to specify it is the “Grade D” part of ISO 14687 being proposed for recognition.  There is concern with citing two standards and recommends the stricter standard be applicable  On review of these comments the Committee assigned the proposal “Developing” status.
L&R	<b>Voting</b> FLR-23.4  Section 4.3. Dispenser Filters	Add filter requirements for commercial hydrogen dispensers	Modify Section 4.3.1 Engine Fuel Dispensers Filters to include a new subparagraph (c) as follows: 4.3. Dispenser Filters  <u>4.3.3 Delivery Gas of Hydrogen</u>  <b><u>(a) All gaseous hydrogen dispensers shall have a 5 micron or smaller nominal pore-sized filter, and</u></b>  <b><u>(b) Shall be fitted with a</u></b>	Recommended for adoption in July 2023 <i>pending</i> further modification of the proposal to include specifications for liquid filters. The NCWM Fuels and Lubricants Subcommittee is seeking input from stakeholders as a result of hearing there is confusion about the proposal in industry and among State Directors. The level of maintenance has also come into question as have all critical specifications for the filters been addressed in the proposed regulations.

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			<p><b><u>coalescing filter that is size appropriate to the dispensing system to protect the vehicle from liquid contamination.</u></b>  <b><u>(Added 20XX)</u></b></p>	

- The NCWM Specifications and Tolerances and Laws and Regulations Committees addressing the proposals for hydrogen including a hydrogen dispenser fueling safety protocol for NIST Handbook (HB) 44 and recognizing a second hydrogen fuel quality standard and filter requirements (i.e., for particulates & liquids) in NIST HB 130 have requested further input on these agenda items. The NCWM S&T and L&R Committees can be contacted through the NCWM website available at: [info@ncwm.com](mailto:info@ncwm.com).
- Comments on these proposals are encouraged and can be provided to the chairperson or in-person during open hearings in the May 2023 regional weights and measures associations meetings up through the July 30 - August 5, 2023 NCWM Annual Meeting in Norfolk, VA. Committee contact and meeting information for upcoming events in the weights and measures community are listed below:
  - The May 8-11, 2023 NEWMA Annual Meeting in Saratoga Springs, NY: The latest information on NEWMA is on the NCWM website available at: <https://newma.us/Specifications-and-Tolerances-Committee> or <https://newma.us/Laws-and-Regulations-Committee>.
  - The May 15-18, 2023 CWMA Annual Meeting in Grand Rapids, MI: The latest information on CWMA is on the NCWM website available at: (<https://cwma.net/event-4911389>) and CWMA committees at: <https://cwma.net/page-1075182> (S&T Cmte.) or <https://cwma.net/page-1075179> (L&R Cmte.).
- If you have questions or comments regarding the 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](mailto:juana.williams@nist.gov) or by telephone at (301) 975-3989.

## VII. Open Discussion & Other Issues

- If any committee members are interested in presenting at any of FCHEA's five technical Working Groups (production, distribution, power, transportation, and commercial), please reach out to Haboon Osmond at [hosmond@fchea.org](mailto:hosmond@fchea.org).

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