



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

**Wednesday, July 8, 2015
TIME: 3:00 – 4:30 pm (Eastern Daylight Time)**

Minutes

Attendees

**Bob Boyd
Connor Dolan
Jay Keller
Jennifer Hamilton
Laura Hill
Marcia Poxson**

**Norman Newhouse
Sandra Ullman
Spencer Quong
Steven Yip
John Grimes
Kevin Schnepf**

**Chris LaFleur
Tony Androsky
Marty Gresho
Julie Weis
Carl Rivkin**

I. Welcome and Housekeeping Items

- The Committee reviewed FCHEA's anti-trust guidelines - Available on FCHEA's members only website.
- The Committee reviewed the meeting agenda.
- The Committee approved the June draft meeting minutes.

II. DOE/HQ Update

Will James

Laura Hill – Fellow at FCTO Safety, Codes, and Standards.

Thank you for attending the AMR. Had ~1900 people attend the AMR.

Office level Award winner – Jesse Schneider with BMW. Two Safety, Codes, and Standards awards, Nick Barillo with PNNL and Jennifer Hamilton with CaFCP.

The papers / presentations are available on the DOE AMR website.

III. C&S Events and Fuel Cell Safety Information

http://www.fuelcellstandards.com/calendar_new.html

Kelvin Hecht

<http://www.hydrogenandfuelcellsafety.info/meetings.asp>

Karen Hall

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 Hall (khall@fchea.org) or Connor Dolan (cdolan@fchea.org).

IV. Global Technical Regulations

Nha Nguyen

Jay Keller – the GTR for vehicles is out and published. Revision Phase two will initiated next calendar year.

V. Codes and Standards Organization Updates

IEC TC 105

Kelvin Hecht

No update at this time.

ISO TC 197

Jill Thompson

Jay Keller – Back on track and healthy with the leadership of Andrei Tchouvelev. Andrei's term is up this December. There is a vote out to endorse Andrei for another three-year term. If you are on that team, please contact Jill to cast your vote.

WG 24 is on a fast track, TR will be sent to vote in a couple of weeks, work on the IS will follow immediately.

There are two new work item proposals, both on fuel quality. One is to consolidate fuel quality documents, the three documents will be consolidated into open document (led by Japan). Jay – this is long overdue and will get rid of redundancy.

There is also a need to re-examine the species of concern and the tolerance levels. European colleagues are looking at the stringent tolerances to determine if they are necessary or if we can relax them. Jay - The PEM technology has advanced significantly since the original work was done to establish the contaminant species and the tolerance levels. The platinum loadings have reduced significantly; this may make the FC more sensitive to impurities thus making the tolerances tighter not looser. Careful, we may not like the answer. Expectation that ISO will have their documents on time and EU will adopt them.

The other activity is investigating fuel quality assurance. What is necessary in a fuel quality provider perspective to ensure that fuel quality standards are complied with. Fuel quality assurance will eventually get rolled up into fuel quality specification and eventually the WG 24 document (ISO 19880-1) or by reference.

WG 24 – On a steeple chase. We had hopefully the final conference call to iron out some of the last minute revisions and changes in response to questions this morning. We will be going to distribution on the TR in the next couple of weeks (vote and review at TC at large and P members). Will be starting on the international standards (IS) starting with the TR. In sync with the needs of Europe as they roll out vehicles and stations. The hope is that the work on the TR will build foundation to quickly move to the IS. The issues which prevented a previous attempt (20100) have been resolved in the current document, few minor things are left to resolve but will be done with the IS. Meeting we had in Paris two weeks ago, had in parallel with it a risk assessment activity led by Shell. Is not competitive with or conflicting with QRA for station itself, but focused on station fill protocol and should a fault occur what would be the impact on the vehicle tank.

Highlighting a couple of issues, few in terms of pressure terminology. There are inconsistencies between ISO documents, between ISO and SAE. WG 24 has stood up to take the lead; this will remain a standing issue at the TC. Pressure nomenclature,

definitions, appropriate limits on the different aspects within the community will need to be resolved (issue between ISO and SAE, as well as different geographic regions).

Bob Boyd – TR, do you think in the next circulation of the TR, expect P member states to have more changes suggestive to the document or is it ready to go and P member states can pass it at this point?

Jay Keller- WG 24 has frozen the document. Last round of expert opinion received. Risk assessment this morning went through last of the comments. Anytime you send a document for review, people will pass comment, so we do anticipate comment, hope they will not be substantial.

Bob Boyd – With the IS coming right away, a lot of issues that have been pushed aside by the Committee, will deal with at the IS level. There may be more comments from P member states that may address at IS level, but good enough at TR level.

Jay Keller – While we push some of these off to the IS, we hope it will not affect the TR.

Jay Keller is the TPD for this activity. Jesse and Guy are the conveners of WG 24 and are doing a great job

Spencer Quong – Other WGs. WG 5 – Nozzles, meeting in France on October 7th. WG 18 the 8th and 9th of October in eastern France.

Julie Weis – WG 5 meeting is scheduled for Oct. 7 at Staubli in Annecy, France. WG 18 meeting is Oct. 8-9 at CEA in Grenoble, France and covers Gaseous hydrogen land vehicle fuel tanks and TPRDs.

NFPA 2

Martin Gresho / Susan Bershaw

Marty Gresho – NFPA 2 is on a short cycle for NFPA (three-years). 18 months is committee actions and 6 months is publication. 2015 version is now available to be read. This is also the time to get changes together. Only have about a year to get changes together and submit for the document. Comments are due in June 2016.

NFPA is looking at separation distances, liquid distances but expanded to include gaseous distances. Expect some changes.

Other are is on enclosures. Hydrogen equipment gets deployed in various enclosures, confusion regarding detection, egress, etc. Some content was put in 2016 edition, will continue in 2019 edition.

Will look at performance based methodology chapter, will look at hydrogen stations. Current text looking at fire code perspective.

Thinking about work on electrical classification. Any issue on classification on hydrogen, now looking at NFPA technical changes, getting them developed and put in.

Just completed some work on coordination on NFPA 30A, dispensing and repair facilities. Spencer and I submitted a number of public inputs coordinating that document. How and

where are we going to work on fuel cell vehicles and have them point to or align with NFPA 2.

NFPA 1 submittals (a competitor to international fire code), used in about 20 states in the US.

NFPA 55 is on the same schedule as NFPA 2. If changes are desired, let us know.

Jennifer Hamilton – Recent conversation with California state fire marshal. Question on having NFPA 2 adopted by the state. To his knowledge that with NFPA 2 2011 version, they would adopt the most current version.

Marty Gresho – Most states need a top tier document, that references these lower tier document. Since the IFC is not as current as the NFPA fire code, may need to make them current on that.

Spencer Quong - NFPA 2 is referenced in IFC, which is then referenced by the state fire code, so that is how the reference flows.

ICC

Bob Davidson

Marty Gresho – Biggest target document for ICC set is the International Fire Code, a group B document. Changes are due out in January of 2016, will be next focus for code changes. Push with the IFC is to have it more reliably and consistently refer to NFPA 2 for hydrogen requirements. Right now for several instances was developed early on (2003 cycle) and preceded NFPA 2. Now that NFPA 2 is developed and in a regular update cycle, we will push to remove some of the more detailed content in the IFC.

CSA

Sara Marxen

No major updates this month. 3 or 4 subcommittees meeting this month - HPIT 2 (July 14 and 21), HGV 4.3 (July 10th and 24th), HGV 4.9 (July 17th and 31st).

Spencer Quong – Close to have HGV 4.3 complete. Goal to have it published by the end of the year.

4.9 – moving forward with same goal of publishing by the end of the year. Gone through 400+ comments. Will tackle some key issues, such as which sections are mandatory. After that will go out for public comment and publication process.

SAE

Mike Steele / Tim McGuire

No update at this time.

ASTM

Tommy Rockward

No update at this time.

ASME

John Grimes

Jennifer Hamilton - ASME just had their power and energy conference. Bill Elrick held a panel (Fuel Cell and Hydrogen Economy) that included some CaFCP members (Honda, Plug Power, Linde, FuelCell Energy, and CaFCP). We also had a Hyundai FCEV on the show floor.

John Grimes – Panel was a success. No update on codes and standards.

VI. Discussion Topics

Facilitating Deployment

Carl Rivkin

The need for trained technicians to operate on the hydrogen fueling stations came up at the AMR. Aaron Harris suggested that the NREL station that just came online could be used as a training tool for a program to have both training for code officials and technicians who will service stations.

Some concern as stations are currently being operated, there is a significant effort to keep them up and running. Right now this requires someone with specific knowledge and experience with the high pressure hydrogen and hosing etc. May require a technician with capability beyond someone who is generally familiar with gas components to keep it running. It is a concern with the next phase of station and vehicle developments.

Anyone with thoughts on how this project might work, let us know. Some thoughts already to do this as part of a community college training programs.

Bob Boyd – Professor in a Southern California junior college is training technicians.

Jennifer Hamilton – John Fralla is a grant getting machine and has multiple grants for developing technician training and other training programs. Suggested he speak with Carl Rivkin and believe he has.

Carl Rivkin – Believe that the program he has developed will be the vehicle. Want to use our station as a training tool (Denver, CO).

Bob Boyd – Could be a model for other programs.

Jay Keller – As we gain experience with infrastructure and vehicle roll-out, what we hear is that the people really like the vehicles. What we also hear is that fueling station experience is less than exemplary and needs improvement.

H₂USA Activities

Karen Hall

H2USA held its Full Participants meeting at the AMR, a face-to-face review of activities and working group meeting. The Working Groups were asked to review and provide input into road-mapping and focus documents that are in the process of development.

H2FIRST

NREL/SNL

Bob Boyd – HySTEP device is to test stations for SAE J2601, SAE 2799, and CSA 4.3 compliance, rather than using a vehicle. The device is on a trailer, with three tanks, has an IRDA transmitter for the temperature/pressure of the tanks. Can send proper and false

signals to simulate what might be sent from the vehicle. The IRDA system is also able to transmit an abort command; many of the early vehicles would send this if the fueling was too fast or too hot. Device being built by Powertek, should be ready in August. Hopefully in CA in September. Project manager for the team will be visiting Powertek soon for testing.

Jennifer Hamilton – There is a California Implementation Team for the HySTEP device, looking to expand the device for agreement moving forward for the first two stations.

Bob Boyd – Testing with the HySTEP device will provide information to CSA and SAE technical committees and will hopefully provide feedback for the next iteration of those documents.

Regulatory Matrix Review and Comment

Karen Hall

The latest version of the Regulatory Affairs Matrix is available online at <http://www.fchea.org/s/FCHEA-Regulatory-Matrix-May-22-2015.pdf>. Comments can be submitted to Karen Hall at khall@fchea.org.

VII. Permitting and Installation of Hydrogen Fueling Stations

Ca Station Implementation

Jennifer Hamilton

Tyson Eckerle is closely monitoring station progress, recently gave me access on the count as of the 6th. Currently there are 21 stations in construction, under construction, approval to build and 22 additional stations in act of permitting.

Might be hearing an announcement about the Sacramento station soon.

We continue to help in implementation of hydrogen readiness in communities; this includes outreach to legislature/permitting workshops (So.Cal in early August / No.Cal in September). We are doing outreach with developers to cities and to community organizations.

Joe Gagliano is working with station owners / operators to spur their interest at hydrogen fueling stations. There is lots of progress in that area.

Jennifer will be presenting to the Codes and Standards tech team soon. Current stations are coming along much more quickly.

On our website, the automaker group posted their next list of priority areas, a continuation of previous activity identifying where customers are. This identifies areas where customers are not being served, and expanding/upgrading current areas.

This work will be used as input to the next funding solicitation from CA (which is anticipated to come out this fall or early next year). We anticipate new players coming in with bids for the next solicitation.

Ca DMS Fuel Quality / Metrology

Kevin Schnepf

DMS is still very active in the metrology testing of hydrogen dispensers. Asked by some station developers for type approved dispensers. When type approved dispensers come out

will require DMS to come out and do initial verification. Preparing agreements to do that work are in progress, even though it is outside typical scope.

We are preparing guidance and advisory documents to facilitate station developers to have the licensing and witnessing for verification.

Working and collaborating with CARB to have a strategy and team ready to bring HySTEP device online and have testing/validation conducted. This will likely have a member from CARB and DMS as a team to do initial benchmarking and deployment at stations, evaluating as a validating device.

SAE J2601 Compliance

Jesse Schneider

Bob Boyd – The SAE 2601 will be reissued in less than 12 months (hopefully). This will incorporate what is known as the Honda MC method (currently in the annex / appendix). This will move into the main body of the document, the document will also be somewhat reorganized so that the fundamental safety principles will go to both the exiting method (table method) and the Honda MC method (now referred to the formula method).

Process is moving along well. At the AMR, Argonne National Labs presented some data on the use of the MC method (formula based) which is an adaptive method to reach a target pressure. The formula method is based on the mass-average temperature and the specific heat of the fuel (thermal energy content of the fuel). This allows for slightly faster fills and less complicated control systems. It allows stations to deliver fuel at a relatively fast rate, even when the station is overtaxed, much more operational flexibility than the current method (table based).

Jay Keller – the MC method allows a smooth continuous fill profile rather than the discontinuous fill profile resulting from jumping from table to table if the fill conditions should change.

Legal Metrology Standards Hydrogen Fuel Quality and Measurement

Juana Williams

Bob Boyd – New ASTM test method proposed by JP Shoo. Simple method with a scale and tank. Can use NIST real gas equations of state to double-check the scale.

VIII. Open Discussion & Other Issues

Next meeting – Wednesday, August 5th at 3:00 PM Eastern.