

## **MINUTES OF THE JANUARY 2009 TELECONFERENCE OF THE NATIONAL HYDROGEN AND FUEL CELLS CODES & STANDARDS COORDINATING COMMITTEE**

**MEETING DATE: January 7, 2009**

**MEETING TIME: 3:00 – 4:30 PM (EST)**

**FACILITATOR: Karen Hall, NHA**

### **1 Roll Call - Robert Wichert**

**Teleconference meeting participants** (85Kb PDF)

### **2 Review of Anti-Trust Guidelines**

**Antitrust Guidelines** (27Kb PDF)

### **3 Review of/Corrections to Draft Minutes of November 2008 Teleconference Meeting**

Approved as written

### **4 Opportunity for DOE/HQ Representative to Provide Latest Information on What's Going on at DOE – Antonio Ruiz**

Antonio briefed the group on the current events at DOE. A new program manager, Pat Davis, has been permanently assigned to Vehicle Technologies. Pat Davis has been working as the interim manager for the past few months, and his assignment is thought to be a great boon for hydrogen and fuel cell technologies. The “high priorities” for vehicle technologies will, of course, be stressed. The details of these high priority items will be discussed more in the future.

The 2009 ICHS Conference in September will be a good opportunity for everyone. Antonio provided a link to Website: <http://conference.ing.unipi.it/ichs2009/>. Please note that the Abstract submission deadline is January 15th.

The siting workshops that have been held for code officials for hydrogen fueling stations and hydrogen fuel cells for backup power for the telecom industry are being assessed as to how they can support the vehicle office as well as synergies with solar and wind.

In the codes and standards area, fuels, engines, materials, and components will be stressed along with similar areas in hybrids and plug-in hybrids.

It is expected that the continuing resolution will be used for another few months until another budget is adopted.

### **5 Opportunity to discuss the California Hydrogen Fuels Project's Efforts to Develop a Hydrogen Standard - John Mough/Gary Castro**

No update.

## **6 Report on Hydrogen Industry Panel on Codes (HIPOC) Activities - Darren Meyers/Tom Joseph**

Darren Myers provided a report on HIPOC. Three changes to the International Fuel Code are being discussed at HIPOC. The definition of bulk gaseous systems and bulk cryogenic systems are also being discussed. For more information please contact Darren Myers directly. ASHRAE has changed some International Codes to cut the ventilation rates for garages and parking areas. This lower ventilation requirement was assessed by HIPOC for possible effects on the safety analyses relative to hydrogen. The new ASHRAE ventilation requirement rate is 0.75 cfm/sq. ft., having been reduced from 1.5 cfm / sq. ft. There is a tentative conclusion that in public garages, 0.75 cfm/sq. ft. might be acceptable. This is preliminary. In SAE, 1 cfm/sq. ft. was assumed for the safety analysis. SAE may just update their assumptions to use 0.75 cfm/sq.ft.

Separation distances have not been addressed yet.

HIPOC is soliciting new membership. Contact Darren Myers if you are interested in this opportunity at [dmeyers@iccsafe.org](mailto:dmeyers@iccsafe.org) .

Because the 2009 editions are being delayed until March, the code development deadlines are April, 2009.

HIPOC will have an in-person meeting in conjunction with the NHA conference.

## **7 Report on NFPA Activities (Technical Committees for NFPA 2, NFPA 52, NFPA 55, NFPA 70 and NFPA 853) – Marty Gresho / Paul May**

Paul May provided a report on NFPA 2. NFPA 2 is now on the Fall cycle. The Committee will be voting in February to release the standard. If the vote is positive, it should be released in March. NFPA 2 and NFPA 52 have received Notices of Intent to Make a Motion, which will require additional work by the Committees and staff.

## **8 Report on DOE / NREL Permitting Workshops -- Carl Rivkin / Chad Blake**

Chad Blake provided an update. There are four dates already set for FY09, the first of which will occur at NREL in Boulder Colorado. First responder and permitting officials will be specifically targeted. The tentative schedule below includes a meeting in Boulder Colorado in January; Southern California in March; in April at the NHA conference; September at ICC in Baltimore; San Francisco; Houston; Florida; Hawaii; and somewhere in the Northwest.

<b>NREL Codes and Standards Permitting Workshop Tentative Schedule</b>		
<b>Location</b>	<b>Partner (s)</b>	<b>Tentative Dates</b>
NREL/Boulder, CO	Clean Energy Development Authority/Jefferson County Fire Department	Jan 2009
Los Angeles	CAFCP, CARB, Orange County FD	Mar 2009

Bay Area California	BAAQMD, CAFCP, Local FD	TBD
Columbia, SC	South Carolina Fuel Cell Alliance, Local FD	April 2/3, 2009
Houston, TX	Houston Area Regional Council, Houston FD	TBD
Florida	Florida Department of Environmental Protection, Florida Bureau of Fire Protection	TBD
Hartford, CT	Connecticut Hydrogen-Fuel Cell Coalition/ State Fire Marshals Office	TBD
Baltimore, MD	Held in Conjunction with the International Code Council Fall Meeting/ Maryland Department of the Environment	Sept. 2009
Honolulu, Hawaii	Hawaii Clean Energy Initiative	TBD
Northwest, USA	TBD	TBD
TBD/Possible Biofuels	TBD	TBD
TBD Possible Biofuels	TBD	TBD

## 9 Report on IEC/TC105 Activities and Documents in the “Comments” Stage – Kelvin Hecht

### TC105 – Fuel Cell Technologies

#### *Working Group #1 Terminology*

The Draft Technical Specification is posted on the IEC website for comments until January 23, 2009.

#### *Working Group #3 Stationary Fuel Cell Power Systems - Safety*

Meeting to be scheduled in February-March to address comments to IEC 62282-3-1 for the next revision cycle. The US TAG submitted 50 comments. There will be a meeting in February in Florida to discuss the comments.

#### *New Work Item Proposal*

Japan, on behalf of the Japan Electrical Manufacturer’s Association (JEMA) is proposing a new standard; Small Stationary Polymer Electrolyte Fuel Cell Power Systems – Performance Test Methods with the following scope:

Output: < 10 kW < 240 V or DC  
Mode: Grid connect / independent or stand alone  
MAWP: < 0.1 MPa  
Fuel: Gaseous or liquid

- Some members of WG#4 felt that this new standard was not necessary.
- It was pointed out that in order to be adopted, four countries would need to agree to participate.
- The Japanese delegation argued that the existing standard is too complicated, and felt that a new standard was necessary.

- Visits - 4,728
- pdf download - 365

#### **Meeting's Calendar**

January 5-6	ISO TC197 WG#9
January 20-22	SAE
January 27-30	IEEE P1547.4, .6 & .7
February 24-26	NFPA 2

### **10 Report on ISO/TC197 Activities and Documents in the "Comments" Phase – Glenn Scheffler / Jill Thompson**

ANSI-Accredited U.S. TAG for ISO/TC 197, *Hydrogen technologies*

### **11 Opportunity for CDOs and SDOs to Report on Their Activities**

#### **11.1 Juana Williams – NIST Weights and Measures Division on the Development of Commercial Hydrogen Measurement Standards**

##### **11.1.1 U.S. National Work Group (USNWG) for the Development of Commercial Hydrogen Measurement Standards**

On December 2-4, 2008 the USNWG met at Micro Motion, Inc. in Boulder, Colorado. The meeting was sponsored by NIST and DOE. The USNWG continues its work to promote the establishment of a uniform and comprehensive set of legal metrology requirements for equipment used in hydrogen measurements for vehicle and other refueling applications.

The USNWG had multiple opportunities to observe related work at NIST, the National Renewable Energy Laboratory (NREL) National Wind Technology Center (NWTC), and MicroMotion, Inc. in Boulder.

The NIST Thermophysical Properties Division and Materials Reliability Division provided an overview of the cryogenic flow facility, ongoing work on thermal conductivity measurement and density metrology, and hydrogen's effect on pipelines and storage vessels, respectively. The work at NIST is critical to equipment manufacturers, laboratories, and officials who must consider the effects of operational conditions and the thermophysical properties of hydrogen on measurements, the durability, suitability, and safety of equipment, components, test standard apparatus, and storage vessels for use/test of equipment in commercial applications. The draft code under development by the USNWG for hydrogen dispensing equipment references the NIST Chemistry WebBook, NIST Standard Reference Database 23, and other publications as sources of thermophysical property information for hydrogen that apply in density calculations.

The NREL NWTC Wind to Hydrogen (Wind2H2) Project provided the USNWG with an opportunity to observe hydrogen production and delivery systems research. The project recently took possession of a fuel cell vehicle and is in the process of installing a gaseous hydrogen dispenser for refueling that vehicle. The dispenser is similar to the type that will operate in publicly accessible service stations and must ultimately comply with the design, performance, fuel quality, and methods of sale requirements under development by the USNWG.

During its tour of MicroMotion, Inc. the USNWG gathered information about the coriolis mass flow meter technology that many equipment manufacturers currently use to meter hydrogen in their refueling dispensers.

a. **Test Procedures**

Proper test methods are essential to establishing confidence in commercial measurements so in 2007 the USNWG recommended that work should be carried out simultaneously to develop equipment standards and corresponding test procedures. Inspection and test procedures for commercial equipment are based on NIST Handbook 44 requirements. The USNWG Device Standards Subcommittee (DSS) is moving forward to establish preliminary minimum specifications for test standards, suitable laboratory and field test procedures, and guidelines. Working to assist the USNWG in meeting that goal are the NIST Weights and Measures Division and Process Measurement Division staff who are conducting a preliminary analysis of the uncertainties associated with the gravimetric, volumetric, and master meter test methods permitted for use to verify the performance of commercial hydrogen dispensing equipment.

The DSS agreed it would be advantageous to multiple stakeholders in the hydrogen community if a single test standard apparatus can be developed for use to verify a dispenser's accuracy. The goal would be to develop a test apparatus that could also be used to determine whether or not the dispenser's fill protocols can attain the fuel's target density recommended by SAE/CSA and automobile manufacturers and not result in over heating and/or over pressurizing the receiving receptacle/vessel.

The DSS noted that further study will be necessary to determine the effects of pressure and temperature sensors (type and location), product stratification, condensation, characteristics of the master meter, and material composition of the test apparatus storage tank on performance test data.

b. **Device Requirements**

As a result of the December 2008 meeting, the DSS will make its latest proposal, Draft 3.3 of the NIST Handbook 44 Hydrogen Gas Measuring Devices Code, available to the January 2009 National Conference on Weights Measures, Inc. (NCWM). An earlier version, Draft 3.1, appears on the January 2009 NCWM Interim Meeting Agenda.

The DSS had lengthy discussions about (1) the suitability of equipment for use in a vehicle refueling application, (2) ensuring that sales of hydrogen to the end user and other sales transactions are fully addressed in the draft code, and (3) properly addressing multiple factors that may affect the accuracy of measurement. Most notably transient flow, pressures, and temperatures, the minimum measured quantity specified by the dispenser manufacturer and the dispenser hose length. It is important that no aspect of the weights and measures component in the hydrogen infrastructure is overlooked so as not to hinder the U.S. transition to a hydrogen economy.

c. **Fuel Quality Specifications**

The USNWG Fuel Specification Subcommittee (FSS) continues to support a proposal for a hydrogen fuel quality standard which is the same as the interim standard adopted in

September 2008 by the State of California. In this case this is an interim standard or a starting point until a national or international standards body recognizes this or another standard. This FSS proposal was distributed for the first time for national review by the weights and measures community and appears on the January 2009 NCWM Interim Meeting Agenda.

The FSS discussed the ability of laboratories to measure all of the constituents specified in the fuel standard and the need for fuel quality laboratories to have standard reference materials. The FSS has proposed one fuel quality standard for both internal combustion engine and fuel cell vehicles. The FSS is considering a procedure that might allow officials/laboratories to simultaneously sample for quantity and quality in part because this method may lessen the likelihood of contaminating the sample.

**d. Method of Sale Requirements**

The FSS addressed 16 CFR PT 309 Federal Trade Commission (FTC) Labeling Requirements for Alternative Fuels and Alternative Fueled Vehicles. The FSS will modify its earlier draft proposal for NIST Handbook 130 Laws and Regulations and Engine Fuel Quality to include a retail dispenser labeling requirement that addresses the FTC requirement for posting the principal component of hydrogen fuel expressed as a minimum percentage. The current proposal specifies the minimum value for the hydrogen fuel index as 99.97, which is the value obtained with the value of total gases (%) subtracted from 100 %.

**11.1.2 Schedule for the USNWG 2009 Meetings**

Upcoming meeting dates and locations for the U.S. National Work Group (USNWG) for the Development of Commercial Hydrogen Measurement Standards are as follows:

**Schedule for the USNWG 2009 Meetings**

<b>Date(s)</b>	<b>Time</b>	<b>Type</b>	<b>Note</b>	<b>Location</b>
January 30, 2009	1:00 p.m. - 3:00 p.m. EST			Tele/Web Conference Meeting
February 24, 2009	1:00 p.m. - 3:00 p.m. EST			Tele/Web Conference Meeting
April 28-30, 2009	Day1&2 8:30 a.m. – 5:00 p.m. Day 3 8:30 a.m. – 12 noon EDT	FSS Meeting	In-Person Meeting	TBD
August 18-20, 2009	Day1&2 8:30 a.m. – 5:00 p.m. Day 3 8:30	FSS Meeting	In-Person Meeting	TBD

	a.m. – 12 noon EDT			
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**DSS – Device Standards Subcommittee (equipment and test procedures)**

**FSS – Fuel Specifications Subcommittee (fuel quality and method of sale)**

### **11.1.3 January 2009 National Conference on Weights and Measures (NCWM) Interim Meeting**

The 94th Interim Meeting of the NCWM (<http://www.ncwm.net>) will be held January 11-14, 2009 in Daytona Beach, Florida. Since 1905 the NCWM is the forum whereby national weights and measures standards have been introduced, discussed, and formally recognized by the States. The Specifications and Tolerances Committee, Laws and Regulations Committee, and Meter Manufacturers Association will be briefed on the status of national and international work to develop commercial hydrogen measurement standards. These groups will be encouraged to continue to provide input on the appropriateness of these standards as the work progresses and to help establish a U.S. position on corresponding international standards. This will be the first time the draft codes developed by the USNWG appear on the NCWM national agenda.

### **11.1.4 Development of International Standards**

The Secretariat (the Netherlands) for International Organization of Legal Metrology (OIML) Recommendation 139 (R 139) "Compressed Gaseous Fuel Measuring Systems for Vehicles" has distributed the first working draft (1WD) of the international standard for review and comment. The 2008 document is the OIML model regulation for equipment used to deliver compressed gases (natural gas, hydrogen, etc.) as a fuel into motor vehicles, small boats, and aircraft. The 1WD for R 139 includes parts: (1) metrological and technical requirements, (2) metrological controls and performance tests, and (3) a test report. There are several sections that raise questions that require input from stakeholders. The most notable of these questions are as follows: (1) Do the requirements that permit national legislation to apply rather than a single uniform international standard create trade barriers? (2) Is software adequately addressed? (3) Should the language set parameters for physical seals and electronic security or be more general (e.g., say suitable means as long as durable and provide evidence of tampering)? and (4) Should tests at constant flow rates be mandatory and are they achievable in today's laboratories?

NIST WMD will distribute the 1WD for R 139 the week of January 5, 2009 to gather input from U.S. stakeholders so that it can establish a U.S. position on the 1WD. Please contact Juana Williams ([juana.williams@nist.gov](mailto:juana.williams@nist.gov)) if you wish to participate or observe the work of the U.S. National Work Group on R 139. U.S. comments must be received by March 1, 2009 to allow sufficient time to develop a U.S. position on the 1WD for R 139.

### **11.2 Report on CSA America Activities -- Julie Cairns / Connie Bielawski**

No report

### **11.3 SAE Activities – Mike Steele / Glenn Scheffler**

Mike Steele provided an update. Meetings will happen during the week of January 20th. J 2579 has been published. J 2578 has not yet been published, but it is approved for publishing.

## 11.4 ASTM – Jackie Birdsall

### 11.4.1 ASTM D03.14 UPDATE:

Jackie Birdsall provided an update. ASTM D03.14 had a meeting in December in Tampa, FL where we addressed some current industry needs including: accumulating information on hydrogen system cleaning for CGA, initiating a work item for hydrocarbons, halogenated compounds, and a standard adapter for field sampling units. We expected multiple draft standards to get balloted but were only able to get one out. We anticipate another six to go to ballot for the June meeting. Additional decisions include referencing EPA CFR 40-136 for a precision of bias and to limit the FTIR spec to C3's.

Hydrogen system cleaning is being addressed for CGA. Work for halogens is also being started, along with field sampling-unit standards work.

The 70 MPa HQSA is currently undergoing the first field test at Powertech. The 35 MPa particulate sampling adapter was successfully placed in series between a station and a vehicle to collect particulates at a normal flow rate (done in Davis, California and funded by the CaFCP). Now proven, this procedure will be written into the ASTM work item 9688.

photo here

Additionally, ASTM met with ISO TC197 WG 12 to coordinate timelines and give input on the CD 14687-2 document. We will present an update to coordinate with SAE later this month. The next meeting is June 22-24 in Norfolk, Va.

For questions please contact D03.14 Chair Jacquelyn Birdsall at 916.375.7421 or [jbirdsall@cafcp.org](mailto:jbirdsall@cafcp.org).

## 12 Report on Draft NHA Codes & Standards Priorities for 2009-01-09 – Karen Hall / Geoff Bromaghim

Karen Hall provided an update.

Three priorities:

1. Development – indoor refueling, separation distance harmonization, liquid hydrogen separation distances
2. Outreach – Permitting workshops, targeted educational sessions, project pick-up
3. R&D – Disseminate NREL and DOE data, update tunnel data and jurisdictional data

The HyPER Installation Permitting Guide is out for public review [See full text of NHA priorities here.](#)

## 13 Report on USFCC Codes & Standards Priorities for 2009 – Sondra Ullman / Robert Wichert

Sondra Ullman provided an update. [See full matrix of USFCC priorities.](#)



## **14 Open Discussion (And Issues for Other Meetings)**

### **14.1 Joint Hydrogen Quality Task Force - Jim Ohi**

A teleconference was held on December 11, 2008 to consider testing activities and work toward reaching conclusions with the current data set. Evaluations are in progress. Revisions to the SAE 2719 document as well as the ISO standard are being considered. ISO WG#12 will meet in February. Comments on the initial Committee Draft will be considered. The US TAG is considering this Committee Draft and everyone is encouraged to provide comments, if appropriate. The ISO Standard is targeted for 2010/2011.

### **14.2 Cargo Transportation of Fuel Cell Vehicles -- Robert Wichert**

Robert Wichert provided an update. The United Nations Sub-Committee of Experts on the Transport of Dangerous goods considered the status of Fuel Cell Vehicles in the UN Recommendations on the Transport of Dangerous Goods, Model Regulations. Fuel Cell Vehicles were given essentially the same status in the regulations as internal combustion vehicles, separated by fuel type – gaseous or liquid fuels. After much coordination with regulators and industry members, a definition of Fuel Cell Engines was also approved,. An article will be provided on the Hydrogen and Fuel Cell Safety web site in February.

### **14.3 NHFCCSCC**

#### *14.3.1 Discussion on frequency of calls*

In November, the group discussed having the call every-other-month due to most committees meeting on that frequency - there were no other comments. Other suggestions have been submitted off line that should be discussed, including continuing the monthly frequency. In January the group discussed the options for future meetings and decided to keep to the monthly schedule and agenda consistent with the current format.

#### *14.3.2 In-person meeting at NHA Conference*

Clemson University has invited us to hold a meeting in conjunction with the NHA Conference on Friday, April 3, 2009 at their International Automotive Conference Center. Attendees would be picked up from Columbia SC, at the NHA meeting hotel at 08:00 AM, be transported to Clemson University in Greenville, SC by bus, and then return to Columbia at around 4:00 PM.

It was decided to accept this invitation, but to ask for teleconference capability for those who cannot make it to the meeting in person.

## **15 Next Meeting**

Next Teleconference Meeting on February 4, 2009, 3 p.m. ET.