

## **MINUTES OF THE DECEMBER 2006 TELECONFERENCE OF THE NATIONAL HYDROGEN AND FUEL CELLS CODES & STANDARDS COORDINATING COMMITTEE**

*Russell Hewett, National Renewable Energy Laboratory*

**MEETING DATE: December 6, 2006**

### **1.0 MEETING PARTICIPANTS**

The listing of teleconference meeting is provided in [Attachment A](#).

### **2.0 REVIEW OF USFCC ANTITRUST GUIDELINES**

USFCC members were asked by Sondra Ullman to be mindful of the anti-trust guidelines, which can be found on the USFCC members website, as well as attached to the minutes of past meetings.

[Antitrust Guidelines](#) (27Kb PDF)

### **3.0 REVIEW OF/CORRECTIONS TO DRAFT MINUTES FROM NOVEMBER 2006 TELECONFERENCE MEETING**

There were no modifications suggested and the Minutes were accepted as final.

### **4.0 OPPORTUNITY FOR DOE/HQ REPRESENTATIVE TO PROVIDE LATEST INFORMATION ON WHAT'S GOING ON AT DOE**

Pat Davis (Subprogram Manager, Hydrogen Safety and Codes & Standards Subprogram) reported on DOE/HQ and Subprogram activities.

As has been mentioned in the past several meetings, the Hydrogen , Fuel Cell and Infrastructure Technologies Program (as are other DOE programs) is operating under a Congressional Continuing Resolution. This is expected to last at least through February.

FY07 funding for the Subprogram is expected to be significantly higher than that for FY06. However, no "sweeping changes" can be made until the Subprogram has a Congressionally-approved budget.

The likely budget the Subprogram will be able to support the development of new Information Resources. In addition, the budget will facilitate supporting all proposed codes and standards development efforts as planned, as per the National Templates.

### **5.0 REGULATORY LOGIC: STATUS REPORT**

*(Firm selected by DOE Golden Field Office to perform much of the codes and standards subcontract administration that, in the past, had been performed by NREL)*

Carolyn Elam reported that the DOE/Golden Field Office has completed award of the multiyear contract with Regulatory Logic LLC (RegLogic) to conduct the subcontracting with the CDOs, SDOs and other organizations that had previously been performed by NREL. Gary Nakarado is the Principal and Managing Director of RegLogic.

While negotiations were in progress to complete award of the contract, Russ Hewett had been working with Gary on the transitioning. This included getting input from the CDOs and SDOs having NREL subcontracts ending the soonest to develop draft SOWs for new contracts with Regulatory Logic.

Where possible, RegLogic will seek to implement multi-year contracts with the CDOs, SDOs and other organizations. However, funding for each such contract will be determined annually, based on guidance from the Subprogram. RegLogic's contracting will be limited to the types of codes and standards efforts that NREL had been conducting in the past. R&D-related contracting that NREL has been conducting in the past will still be conducted by NREL.

- **Gary Nakarado**  
Telephone: (303) 526-9190  
Email: [Gary@Nakarado.com](mailto:Gary@Nakarado.com)

## **6.0 UPDATE ON ANALYSIS OF THE DOT HYDROGEN CODES & STANDARDS GAP ANALYSIS REPORT AND RESPONDING BACK TO DOT**

Karen Hall reported that NHA (with input from USFCC and members of the Coordinating Committee) has completed the report providing industry feedback and comments to DOT from analysis of their report Hydrogen Infrastructure Safety Technical Assessment and Research Results Gap Analysis (April 2006) and submitted it to DOT. The report has the endorsements both of NHA and USFCC.

[NHA DOT Gap Analysis - Industry Feedback Report](#) (191Kb PDF)

The report is available also on the NHA website:  
<http://www.hydrogenandfuelcellsafety.info/2006/dec/dotGap.asp>

The DOT Gap Analysis report can be reviewed at the following website: [http://www.rita.dot.gov/publications/hydrogen\\_infrastructure\\_safety\\_analysis/](http://www.rita.dot.gov/publications/hydrogen_infrastructure_safety_analysis/)

Karen stated also that NHA has offered to give DOT an oral presentation on the industry report.

## **7.0 REPORT ON HYDROGEN INDUSTRY PANEL ON CODES (HIPOC) ACTIVITIES**

Patrick Serfass reported on HIPOC activities.

A major focus of HIPOC has been on the ICC 2006/2007 Code Development Cycle. At the initial Code Development Hearings held September 20 – 30 in Lake Buena Vista, FL, 15 hydrogen-related code changes had been proposed for three ICC International Codes. Of those, the respective code development committees recommended seven for approval and eight for disapproval. The final votes will be at the **Final Action Hearings**.

Of the ones that were disapproved, HIPOC is focusing mainly on two for the International Fire Code – to have them re-considered for approval at the **Final Action Hearings** to be conducted in Rochester, NY during the period May 22 – 25, 2007:

1. **F155-06/07** (Indoor fast-fill dispensing)
2. **F156-06/07** (Electrostatic discharge for fueling pads)

ICC has published the document *Report of Public Hearings* that articulates the official reasons for approval and disapproval of all proposals. The *Report* can be found at the following website: <http://www.iccsafe.org/cs/codes/2006-07cycle/ROH>

In parallel, HIPOC is addressing code change proposals to **NFPA 52** (*Vehicular Fuel Systems Code*) – formulating its own proposals, as well as reviewing those having been formulated by others.

Carl Rivkin has announced that the schedules for the revision cycles for **NFPA 52** and **NFPA 55** have been changed: the closing date for submitting proposals for both is now May 26, 2007 (rather than November 22, 2006).

HIPOC is still asking Coordinating Committee members and other stakeholders wishing to submit NFPA 52 code change proposals, to submit them to Carl Rivkin. HIPOC is interested in receiving either or both of two types of code change proposals:

- Proposals for HIPOC to take up and go forward with
- Proposals to be submitted by others for HIPOC to review and support

Instructions on how to submit a code proposal and other important information can be found at:<http://www.hydrogenandfuelsafety.info/hipoc/proposals.asp>

Information about HIPOC, including the Minutes of meetings, is available on the following website:<http://www.hydrogenandfuelsafety.info/hipoc>

Key dates, with respect to the ICC and NFPA codes and standards development processes, can be found at the following web site:<http://www.hydrogenandfuelsafety.info/hipoc/keyDates.asp>

Again, note that the activities of the HIPOC are not intended to substitute for the procedures of either NFPA or ICC. Rather, the HIPOC is a group of industry experts with experience in getting consensus code modifications into the model codes.

## **8.0 REPORT ON NFPA ACTIVITIES (HYDROGEN TECHNOLOGY TECHNICAL COMMITTEE TO DEVELOP NFPA 2)**

Carl Rivkin reported on the first meeting of the NFPA Hydrogen Technology Technical Committee established to develop the new NFPA document **NFPA 2 Hydrogen Technology Code**.

Creating **NFPA 2** involves: (1) identifying and extracting existing hydrogen-related requirements in current NFPA documents and organizing them in the new document; (2) correlating and harmonizing the extracted requirements; (3) identifying gaps; and (4) addressing the gaps.

The first meeting of the Technical Committee was held on November 2-3 in Golden, CO -- hosted by NREL, and held in a DOE/Golden conference room.

The meeting resulted in:

1. Developing the scope for NFPA 2
2. Developing an outline articulating how the document should be organized and what it should cover
3. Organizing the members of the technical committee into task groups -- each to work on a section of the document
4. Rough putting together of the document (by extracting from various NFPA documents)

In addition, there were three presentations:

1. Bill Houf (Ongoing Hydrogen Properties R&D at Sandia/ Livermore)

2. Jeff LaChance (Risk-Informed Decision Making)
3. Robert Zalosh (US Hydrogen Safety Standards Guidelines and Practices)

Carl reported that the meeting was very successful.

[NFPA Hydrogen Technology Technical Committee Meeting minutes](#)(80Kb PDF)

The next in-person meeting has tentatively been scheduled for April 17 – 19, 2007 at NextEnergy in Detroit.

The goal is completing the first edition of **NFPA 2** by October 2010.

## **9.0 PROPOSED EFFORT BY NATIONAL ASSOCIATION OF STATE FIRE MARSHALS (NASFM) TO DEVELOP A HYDROGEN SAFETY CODE**

There was confusion or misunderstanding regarding whether or not NASFM was proposing to develop a hydrogen safety code document.

Since Paul Buehler (Plug Power, Inc.) was involved in NASFM activities, Russ Hewett asked him to give a report on NASFM hydrogen-related activities, as they relate to the development of safety requirements.

Paul reported that there is no intention on the part of NASFM to develop a competing "ANSI approved" hydrogen safety code. However, NASFM is preparing to write hydrogen-related *Guidelines* for fire fighters and first responders – to help them in recognizing hazards with respect to hydrogen systems. In particular, NASFM is planning to develop *Guidelines* for motor vehicles and for stationary applications.

The *Guidelines* will be developed by NASFM Hydrogen Executive Leadership Panel (HELP) Committees, following an ANSI-like open process.

During the discussion, it was pointed out that the University of Maryland has a contract with the NFPA Research Foundation to develop vehicle *Emergency Response Guidelines* – a guideline for emergency responders and one for vehicle owners. There is the issue of the relationship (if any) between that activity and the NASFM activity.

Russ Hewett asked if it would make sense to invite the appropriate NASFM or HELP representative to an upcoming meeting of the Coordinating Committee -- to familiarize Committee members with NASFM activities and explore possibilities for collaboration.

Tony Androsky agreed to work with Russ to make this happen.

## **10.0 REPORT ON NHA "HYDROGEN ENERGY TECHNOLOGY WORKSHOP: Safety, Installation and Permitting"**

Patrick Serfass reported on the workshop "Hydrogen Energy Technology Workshop: Safety, Installation and Permitting" conducted by NHA in Honolulu, HI in conjunction with the USFCC 2006 Fuel Cell Seminar.

The objective of the workshop was to give attendees:

1. Compilation of tools and methodologies for use in the permitting of hydrogen fueling station projects
2. Examples of case studies (i.e., first hand experiences)
3. Compilation of lessons learned

The workshop included presentations by representatives from NHA, NREL, Air Products, Jadoo Power and the Hawaii Natural Energy Institute.

The presentations can be downloaded from the following website:<http://www.hydrogenandfuelcellsafety.info/h2techWorkshop.asp>

## **11.0 REPORT ON IEC/TC105 ACTIVITIES, DOCUMENTS IN THE "COMMENTS" STAGE AND THE HYDROGEN AND FUEL CELLS C&S MATRIX AND DATABASE**

Kelvin Hecht reported on IEC/TC105 activities – focusing on the work completed by the various Working Groups in 2007.

[IEC/TC105 Report](#) (89Kb PDF)

With respect to the **Hydrogen and Fuel Cells C&S Matrix and Database**, Kelvin, in the Final Report for his subcontract with NREL, presented the following graphic showing website activity -- monthly -- since January 2004.

[Fuelcellstandards.com activity chart](#) (18Kb Excel file)

## **12.0 REPORT ON ISO/TC197 ACTIVITIES AND DOCUMENTS IN THE "COMMENTS" STAGE**

Bob Mauro reported on the key current ISO TC/197 activities in November.

[ISO/TC197 Report](#) (71Kb PDF)

The following are of special significance:

1. The US TAG voted to disapprove the draft standard ISO 15869.2 **Gaseous hydrogen and hydrogen blends – Land vehicle fuel tanks**. The US TAG for ISO/TC58/SC3 recommended that the draft be approved. The final vote was the DIS being disapproved, with the US, Japan, Germany, Norway and the UK voting "No."
2. **ISO/DTS 14687-2 Hydrogen fuel – Product specification – Part 2: Proton exchange membrane (PEM) fuel cell applications for road vehicles** is out for vote and comments until the end of November. During the 20th November teleconference meeting, major revisions to the comments were made and adopted by the TAG. The TAG voted to "Approve" with comments.

In addition, ISO (and the US TAG) have been asked to review and comment on three IEC standards:

1. IEC/CDV 62282-6-2 **Fuel cell technologies - Part 6-2: Micro fuel cell power systems – Performance**
2. IEC/CDV 62282-3-3 **Fuel cell technologies - Part 3-3: Stationary Fuel cell power systems – Installation**
3. IEC/CDV 62282-6-3 **Fuel cell technologies - Part 6-3: Micro fuel cells power systems - Interchangeability**

## **13.0 REPORT ON ISO/TC197 WG12 (Hydrogen fuel - Product specification)**

Jim Ohi reported on the in-person meeting of WG12 held in conjunction with the *USFCC 2007 Fuel Cell Seminar* and hosted by the University of Hawaii.

Jim reported that there was good industry participation. The meeting focused on: (1) R&D and development of a test program to get data for the technical specification; and (2) further develop the time table to go from the technical specification to a committee draft of an international standard and then to a Draft International Standard (DIS) in three years. The committee is planning to complete development of the committee draft of the international standard by October 2007. This is to be done in parallel with the R&D and testing.

At the meeting, the North American proposal for doing the testing was presented:

- Testing protocol
- Test matrix
- Data format for reporting and for developing computer models

There was an ASTM presentation at the meeting that addressed ASTM's priorities for developing methodologies for measuring the constituents in hydrogen fuel for PEM fuel cells for on-the-road vehicles.

The next meeting of WG12 is scheduled for late April 2007. WG12's goal is formulating an international approach for R&D and hydrogen fuel constituent testing.

Jim also reported on coordinating with FC TESTQA. The North American WG12 membership plans to brief the European FC TEST QA what the needs are so that they can be incorporated into the European work.

Bob Mauro cautioned against putting out a committee draft international standard until there is international agreement regarding methods for measuring contaminants.

## **14.0 OPPORTUNITY FOR CDOS AND SDOS TO REPORT ON THEIR ACTIVITIES**

**SAE:** Mike Steele reported that the SAE Fuel Cell Standards Committee will be having their first series of meetings in 2007 during the period 15 – 18 January in Troy, MI.

**ASME:** John Koehr reported that ASME's B31.12 Section Committee (Code for Hydrogen Piping and Pipelines) is actively working and will have its next meeting in January 2007.

There were no other reports.

## **15.0 OPEN DISCUSSION**

### **15.1 Workshop on Facilitating Permitting of Hydrogen Fueling Stations**

Russ Hewett and Jim Ohi reported on the DOE/NREL *Workshop on Facilitating Permitting of Hydrogen Fueling Stations* scheduled for February 1st in Sacramento, CA – to be hosted by the California Air Resources Board (CARB).

The objective is to bring together representative HFS project developers, local/state permitting officials that have been involved in permitting actual projects, energy suppliers, codes and standards development organizations, etc. -- together with the DOE Hydrogen Codes and Standards Tech Team -- to:

1. Share experiences and "lessons learned" from the permitting of actual HFS projects -- both from the perspectives of project developers and local/state permitting officials
2. Identify the critical issues with respect to the permitting of projects (again, from the perspectives of project developers and permitting officials)

3. Identify what is needed to facilitate the efficient, timely permitting of projects (e.g., additional codes & standards, tools, methodologies, etc.?)
4. Solicit input and recommendations from project developers, permitting officials and other stakeholders for a possible DOE initiative to facilitate permitting (again, for project developers and local/state permitting officials).

More details regarding the Workshop will be presented at the January teleconference meeting.

### **15.2 Possibilities for Next In-Person Meeting of the Coordinating Committee**

Each year, the Committee seeks to have at least two In-Person meetings – ideally, in conjunction with events that members are already likely to be at anyways. There was discussion regarding holding it in conjunction with the meeting of the DOE Codes and Standards Tech Team that has been scheduled for January 30th at Sandia/Livermore. However, most members of the Committee are not likely to be at that meeting.

Also, there was discussion regarding holding the next In-Person meeting in conjunction with the workshop discussed in Section 15.1. Another possibility discussed was having it in conjunction with the NHA's 2007 Annual Hydrogen Conference scheduled for March 18 – 22, 2007 in San Antonio.

However, no decision was reached. Russ Hewett, Robert Wichert, Sondra Ullman and Karen Hall were given the action item to address the issue and bring their recommendation to the Committee at its January 2007 meeting.

## **16.0 NEXT TELECONFERENCE MEETING**

The January meeting is scheduled to be a teleconference meeting as follows:

- DATE: January 3 (First Wednesday)
- TIME: 3:00 – 4:30 pm EST  
2:00 – 3:30 pm CST  
1:00 – 2:30 pm MST  
Noon – 1:30 pm PST
- CALL-IN NUMBER: (641) 793-7000  
- Pass Code: 824011#

The agenda will be disseminated with the Final Announcement.

If there are items you would like to have on the agenda, please contact any one of the following:

- Karen Hall
- Sondra Ullman
- Robert Wichert
- Jim Ohi
- Russ Hewett

ATTACHMENT A: PARTICIPANTS IN THE DECEMBER 2006 TELECONFERENCE MEETING OF THE NATIONAL HYDROGEN AND FUEL CELLS CODES & STANDARDS COORDINATING COMMITTEE

NAME	ORGANIZATION	PRESENT
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		<b>AT MEETING (Yes/No)</b>
Adam Gromis	California Fuel Cell Partnership	
Andrei Tchouvelev	A. V. Tchouvelev & Associates, Inc.	Yes
Anna Stukas	Angstrom Power	
Antonio Ruiz	USDOE/Hydrogen, Fuel Cell and Infrastructure Technologies Program	Yes
Bill Chernicoff	USDOT/Research and Innovative Technologies Administration(RITA)/Washington	
Bill Collins	UTC Fuel Cells	Prior Commitment
Bill Hoagland	Hoagland and Associates	
Bob Mauro	Consultant to NREL	Yes
Brad Smith	Shell Hydrogen	
Brian Walsh	US Fuel Cell Council	
Bruce Kinzey	Pacific Northwest Laboratory	
Carl Rivkin	National Fire Protection Association (NFPA)	Yes
Carolyn Elam	DOE Golden Field Office	Yes
Cathy Gregoire-Padro	Los Alamos National Laboratory (LANL)	
Christina Zhang-Tillman	California Fuel Cell Partnership	
Christopher Moen	Sandia National Laboratories/Livermore	Yes
Dan Casey	ChevronTexaco	
Darren Meyers	International Code Council (ICC)	Yes
Debbie Angerman	Compressed Gas Association (CGA)	Yes
Doug Horne	Clean Vehicle Education Foundation	



Elizabeth Turnbull	SENTECH	
Gary Howard	A. V. Tchouvelev & Associates, Inc.	
Gary Nakarada	Regulatory Logic	
Gerry Myers	SPRINT	
Greg Milewski	Shell Oil Products	
Hank Seiff	Clean Vehicle Education Foundation	Yes
Jeff Grant	Ballard Generation Systems	
Jesse Schneider	DaimlerChrysler	
Jim McGetrick	BP	
John Koehr	American Society of Mechanical Engineers (ASME)	Yes
John Mough	California Division of Measurement Standards	Prior Commitment
Juana Williams	NIST	Yes
Julie Cairns	CSA America	Yes
Karen Hall	National Hydrogen Association (NHA)	Yes
Kelvin Hecht	ANSI, IEC and Consultant to NREL	Yes
Ken Krastins	Plug Power	
Larry Johnson	SPRINT	
Larry Moulthrop	Proton Energy Systems	Yes
Laurie Florence	Underwriter Laboratories	UL STD Meeting
Lesley Crowell	California Air Resources Board	Yes
Mark Richards	Versa Power Systems	
Michael Steele	General Motors Advanced Technology Vehicles	Yes
Nha Nguyen	NHTSA/Office of International Policy and Harmonization	

Nick Burkhead	Shell Hydrogen	Yes
Patrick Serfass	National Hydrogen Association (NHA)	Yes
Pat Davis	USDOE/Hydrogen, Fuel Cell and Infrastructure Technologies Program	Yes
Paul Buehler	Plug Power, Inc.	Yes
Prentiss Searles	American Petroleum Institute (API)	Yes
Robert Wichert	US Fuel Cell Council (USFCC)	
Rhoads Stephenson	Motor Vehicle Fire Research Institute	Yes
Roger Smith	Compressed Gas Association (CGA)	
Samuel Lam	British Columbia Ministry of Transportation	Yes
Sam Sprik	National Renewable Energy Laboratory (NREL)	Yes
Sheral Arbuckle	Ford Motor Company	Yes
Sondra Ullman	Plug Power	Yes
Spencer Grieco	CSA America	
Steve Turner	C&S Consultant	
Terry Conrad	Concurrent Technologies Corp.	Yes
Thad Adams	Savannah River National Laboratory	
Tom Joseph	Air Products and Chemicals	Yes
Tony Androsky	US Fuel Cell Council (USFCC)	Yes
Jim Ohi	National Renewable Energy Laboratory (NREL)	Yes
Russ Hewett	National Renewable Energy Laboratory	Yes

**GUEST PARTICIPANTS**

Charles Myers – Nuvera Fuel Cells, Inc.

