



Hydrogen Executive Leadership Panel Spring 2006 Meeting

Santa Fe, New Mexico
March 29-31, 2006

Meeting Minutes

Attendees, by Category

Industry

Paul J. Buehler, Jr., Plug Power, Inc.
Sergey Dorofeev, FM Global
Dave Fosdeck, ESRI
Jim Gatzke, Toyota
Mike Greene, BAE Systems
Adam Gromis, California Fuel Cell Partnership
Jennifer Hamilton, California Fuel Cell Partnership
Jay Joseph, American Honda Motor Co., Inc.
John Lemen, Chevron Texaco Technology Ventures, LLC
Shimpei Miura, Toyota Technical Center, U.S.A. INC
Rene Parker, Select Engineering Services
Doug Sato, Toyota
Jennifer Schottke, ESRI
Ron Shaw, Extrication.com (guest of Toyota)
Brad Smith, Shell-Hydrogen
Justin Ward, Toyota Technical Center, U.S.A. INC

Federal

John Bresland, Chemical Safety and Hazard Investigations Board
Dave Bryson, National Highway Traffic Safety Administration
Katia Cervoni, U.S. DOT - Pipelines and Hazardous Materials Safety Administration
William Chernicoff, U.S. Department of Transportation
Christy Cooper, U.S. DOE Hydrogen Program
Patrick Davis, US Department of Energy
Ashok Kaveeshwar, Research and Innovative Technologies Administration, U.S.
Department of Transportation
David Lehman, U.S. DOT - Pipeline and Hazardous Materials Safety Administration
Brigham McCown, U.S. DOT - Pipelines and Hazardous Materials Safety Administration
Dave Sargent, U.S. DOT - Office of Hazardous Materials Initiatives and Training
Pipeline and Hazardous Materials Safety Administration
Candace Simon, U.S. DOT - Office of Hazardous Materials Initiatives and Training
Steve Younis, Prospective Technology, Inc. (for US Department of Defense)

Emergency Responders

Jim Burns, New York State Office of Fire Prevention and Control
Richard Fleming, District of Columbia Fire & Emergency Medical Services Department
Virginia Garza, National Fire Information Council
Frank Garza, Washington State Fire Marshal
Christopher Grotton, Maine State Police
Stephen Guarino, California State Fire Marshal
Rick McCullough, Saskatchewan, Canada, Fire Commission
Chris Miller, South Carolina Rescue and Emergency Workers Union
Randall Napoli, Florida Office of State Fire Marshal
Frederick Postel, Chief, West Sacramento, CA Fire Department
Keith Richter, Contra Costa County Fire Department
Reyes Romero, New Mexico Firefighters Training Academy
Arturo Sais, New Mexico Firefighters Training Academy
Charles Scott, Sr., Nashville Fire Department
Alan Shuman, State Fire Marshal, Georgia
John Standefer, State Fire Marshal, New Mexico
Bill Summers, West Sacramento, CA Fire Department

General

Kwame Brown, Washington D.C. City Council
Bill Ankner, Missouri Transportation Institute
Bill Davis, National Alternative Fuels Training Consortium (NAFTC)
K. Krishnamurthy, University of Missouri-Rolla
Randall Levelle, National Alternative Fuels Training Consortium (NAFTC)
Chuck Mosher, Washington State's Citizens' Committee on Pipeline Safety
R. Paul Williamson, University of Montana - College of Technology

Staff and Consultants to NASFM

Mike Callan, Callan & Company
Elan Martin, NASFM
Frank McGarry, NASFM
George Miller, International Consortium for Fire Safety, Health and the Environment
Chrishawn Morgan-Price, NASFM
Peter O'Rourke, NASFM
Pete Sparber, NASFM
Elizabeth Tucker, NASFM

EDITORIAL NOTE: These minutes attempt to accurately summarize in a few paragraphs what often were lengthy, detailed presentations. All presentations will be made available on the HELP website in their full text. <http://www.nasfmhydrogen.com>

Opening Session:

The meeting opened with welcoming remarks from John Standefer followed by introductory remarks from Dr. Ashok Kaveeshwar, introductory comments from Frederick Postel and review of the 2006 operating plan by Chuck Mosher.

George Miller then gave a progress report on the following projects already in process.

- HELP's application for American National Standards Institute accreditation was submitted in February. HELP's proposed operating procedures are available for public comment until March 31, 2006. If accredited, HELP may begin submitting proposed documents for approval as American National Standards. A small modification to the HELP Charter to ensure balance among the key stakeholder groups and will post all documents, comments and actions on our website for anyone to see.
- We continue to fill vacant slots on HELP's committees so that we have strong representation from all stakeholder groups, and we have even gone so far as to cover the travel costs of those who most need help.
- **Project 2-C: Model Building and Fire Codes.** NASFM asked for assistance in drafting hydrogen-related proposals to the International Codes. On March 24, NASFM submitted proposals on the indoor use of hydrogen, storage limitations at high-risk occupancies and the need for diking with cryogenic hydrogen. Copies of the code proposals were made available at the meeting for attendees.
- **Project 1-A: Environmental Benefits of the Transition:** Cynthia Verduga-Peralta of California's South Coast Air Quality Management District has kindly offered to host a meeting this Spring to begin planning an environmental education project for local officials. Chris Grundler of the US Environmental Protection Agency also has volunteered to participate and we have had productive discussions with the Natural Resources Defense Council and others.
- **Project 1-B: Auto Safety.** Mr. Miller reported that a number of well qualified volunteers have agreed to produce and recommend an auto fire investigation protocol capable of helping us collect some more detailed data on these fires. These investigations will be coordinated with the available literature. A summary of the project and a list of the volunteers were provided to attendees.

The group then split into two breakout groups: Emergency Responders Safety Training and the Community Communications.

Community Communications Group Breakout Session:

Moderator: Chuck Mosher

Attendees:

Kwame Brown, John Bresland, Katia Cervoni, Christy Cooper, Richard Fleming, Stephen Guarino, Ashok Kaveeshwar, John Lemen, David Lehmen, Randall Levelle, Brigham McCown, Frank McGarry, Chrishawn Morgan-Price, Chuck Mosher, Candace Simon, Brad Smith

Meeting Notes:

Mr. Mosher began the session with an overview of effective criteria for a community communications program. The key ideas put forward were:

- One size doesn't fit all,

- Great ideas come from the local level, and
- The key to getting things done is working and listening to the community.

Mr. Mosher also laid out the criteria for success: getting acceptance, approving safety and working with the community. The overall goal of the group is acceptance from the community, to bring the community in early, to make them feel vested, to receive cooperation from key parties, and have materials readily available.

Community Communications & Safety Message Brad Smith

Brad Smith gave an overview of Shell Hydrogen’s communication and safety message. Mr. Smith reviewed “What Works” before the permit application – including assessments of the community, contacting local experts and consultants, preliminary contact/discussion with local officials, and clarification of zoning codes and process. “What Works” during the permit application process and beyond includes safety discussions with authorities, hydrogen awareness/education, group meetings to increase contact, and vehicle rides and drives.

“What Needs Help” before permitting includes national, state and local advocacy support and regional awareness/education programs. “What Needs Help” during the permit process and beyond includes advocates’ availability for meetings, a trusted and unbiased safety expert pool, defined training programs for local first responders/officials, and a broader industry track record.

Shell currently has a retail hydrogen station in Washington, DC. On site training conducted includes, First Responder, dispenser use, maintenance service provider, and gasoline station attendants’ hydrogen safety training.

Shell Hydrogen safety messages are intended to increase community awareness of the advantages of hydrogen and describe how it compares to other common fuels. Further, Shell mentions the numerous organizations involved with hydrogen safety in the U.S. They note that the industry has more than 50 hydrogen fueling facilities safely operating daily worldwide.

National Alternative Fuels Training Consortium (NAFTC) Randall Levelle

The NAFTC mission is to improve air quality and decrease U.S. dependence on foreign oil by promoting, supporting, and expanding the use of advanced technology vehicles and alternative fuel vehicles. Some of their partners include automotive manufacturers, government agencies, industry organizations and educational institutions. NAFTC is headquartered at West Virginia University and works through 30 national training centers. The program provides curriculum development, competency-based training and consumer education & outreach. Classes are offered via classroom, lab, shop and computer-based programs. NAFTC offers over 20 first responders training courses and workshops. They currently offer a Hybrid Safety workshop for first responders.

In 2002 and 2004 NAFTC held the National Alternative Fuel Vehicle Day Odyssey that welcomed 25,000 direct attendees. There were over 24 million reached via Internet, print, radio and television with 655 local partners and sponsors. This event was conducted on the

local level with community-based activities, multiple stakeholders and local partners. The next planned date for the AFV Day Odyssey is October 12, 2006.

U.S. Department of Energy's (DOE) Hydrogen Fuel Initiative Christy Cooper

In support of the President's Hydrogen Fuel Initiative, the DOE Hydrogen Program focuses on hydrogen production and delivery, storage, and fuel cell R&D; crosscutting activities include systems analysis; technology validation; safety, codes and standards; and education. DOE's Hydrogen Learning Demonstration project brings together auto and energy companies to evaluate hydrogen refueling and hydrogen fuel cell vehicles in "real world conditions" in CA, FL, MI, NY, and DC. As of March 2006, the project includes 59 of 131 planned fuel cell vehicles on the road and 9 of 20 planned hydrogen stations now up and running.

DOE has also conducted a Hydrogen Baseline Survey to learn what people know or don't know about hydrogen – the report (as well as other educational materials such as fact sheets) is now available at www.hydrogen.energy.gov. Other communications activities include a community information program, targeting communities where Hydrogen Learning Demonstration projects are located, and community seminars, which are planned for next year. The seminars will be similar to previous "Hydrogen 101" workshops, intended to introduce the concept of a hydrogen economy and hydrogen technologies.

California Fuel Cell Partnership (CaFCP) Community Communications Activities Adam Gromis

The CaFCP began in 1989 and maintains a fleet of 129 cars, 9 buses and 23 fueling stations. Among the ways the CaFCP is working with the community are through training, community workshops, public tours of the facilities, Road Rallies (with local government heads), and the CaFCP website.

Community Communications Proposed Membership Groups Chuck Mosher

Mr. Mosher asked for suggestions on new prospective members to the Community Communications group. The following groups were proposed:

- National Association of State Universities and Land-Grant Colleges
- National Environmental justice group
- American Association of University Professors
- University Presidents Association
- Automakers
- American Bar Association
- Science writers (as advisors, not members)
- Risk management communications specialist (name of actual group will be provided)
- National Governors Association
- HELP individual membership

Next Steps

The Community Communications group will draft recommended guidance for community communications activities, based on the concepts and with knowledge of the needs and resources discussed at this meeting. Mr. Mosher, Mr. Brown and NJ State Senator Tony Bucco will oversee the drafting and may ask other members of the group for help.

In accordance with HELP procedures, this draft will be posted on the HELP website and otherwise distributed by June 15 to permit input from all HELP members, and then discussed and improved at the August HELP meeting. It will then be posted for consideration as an adopted best practice at the Fall HELP meeting.

Emergency Responder Safety Breakout Group Session

Attendees:

S. Miurta, D. Bryson, C. Grotton, R.P. Williamson, A. Gromis, J. Hamilton, J. Joseph, B. Summers, F. Garza, J. Ward, R. Shaw, J. Gatzke, D. Sato, K. Burns, J. Burns, S. Dorofeev, P. Davis, R. Parker, B. Davis, J. Bresland, J. Standefer, R. Napoli, D. Sargent, A. Shuman, F. Postel, R. McCullough, P. Buehler, S. Younis, W. Chernicoff

Presentation and agreement on criteria for an effective emergency responder training program

Mr. Callan discussed the goals for the meeting:

- Criteria for an effective program.
- Review of existing training programs.
- Outline for equipping the New Mexico Firefighter Training Academy and other regional training centers.

The University of Montana's Hydrogen Program R.P. Williamson

Dr. Williamson views the hydrogen economy as a set of successive building blocks, beginning with a Phase 1, in which hazard exposures are addressed. A safety training program needs to be product-specific: information, training, and UL (or other lab) listing for each product. There should also be a "hydrogen hotline" or other database for gathering information on incidents involving hydrogen. There should also be hydrogen education for the public and emergency responders (basic science education).

In Phase 2: Data compilation must begin while the database is still small. A training schedule should also be worked out. In Phase 3: "Train the trainers" should be implemented, mobile trainers launched, and emergency responders given the tools. In Phase

4: 3-4 years out, public education will become necessary. In Phase 5: Long-term (5-10 years), databases should be compiled for all products.

Comments and questions

P. Younis: The group has much more than hydrogen to deal with. Emergency responders should be trained on multiple fuel systems with a modular approach.

R. Shaw: Should develop a general program then specialize for different fuel systems.

R. Napoli: Hydrogen is what gets people's attention. Important to keep the focus on that.

B. Summers: Program should focus on the responder's abilities. Program should be constructed in terms of current techniques and how they can be applied to alternative fuels

National Alternative Fuels Training Consortium Bill Davis – West Virginia University

Mr. Davis provided an overview of the NAFTC program, in which animations are used to supplement training because many scenarios cannot yet be replicated. But NAFTC believes that hands-on training is the best form of training. Possible audiences for trainings include: trainers, pre/in-service technicians, the general public. They currently use a traditional delivery method for training, but are moving to a computer-delivered form.

NAFTC first-responder training involves a hybrid safety workshop and first-responder safety. They have had significant requests for training on the subject. NAFTC has community communication capability to help. The goal is to get information into the rural departments by education/outreach events, websites, regional schools, newsletters, governments, and the Fire Marshals.

Comments and questions:

P. Buehler: everything the group has been talking about is related to motor vehicles. What is being done for stationary fuel cells?

B. Davis: NAFTC is developing stationary fuel cell training

R. Napoli: Emergency responders need fuel cell manufacturers to help develop training programs

P. Davis – DOE does have a hydrogen incident database that will be opened online in April. The database will focus on lessons learned. The data is not validated, and reporting is voluntary. The Natural Gas Vehicle America group is compiling data from natural gas incidents.

California Fuel Cell Partnership Adam Gromis – CAFCP

Adam Gromis discussed the history of the CAFCP. There are 126 cars and 23 refueling stations that are part of the partnership. The CAFCP emergency responder training program has a "community empowerment model," the DOE permitting guide, emergency responder training and unique procedures for incidents involving fuel cells. All are available on CD. CAFCP is in the process of developing new elements of training – multimedia training, modular training, web-accessible, and audience-focused.

U.S. Department of Energy Hydrogen Program

In support of the President's Hydrogen Fuel Initiative, the DOE Hydrogen Program focuses on hydrogen production and delivery, storage, and fuel cell R&D; crosscutting activities include systems analysis; technology validation; safety, codes and standards; and education. DOE's Hydrogen Learning Demonstration project brings together auto and energy companies to evaluate hydrogen refueling and hydrogen fuel cell vehicles in "real world conditions" in CA, FL, MI, NY, and DC. As of March 2006, the project includes 59 of 131 planned fuel cell vehicles on the road and 9 of 20 planned hydrogen stations now up and running. For more see www.hydrogen.energy.gov.

In FY 2006, DOE's emergency responder training program is focused on awareness level materials that will be offered in multiple formats, including via the web. The material will undergo a broad review in late April. The awareness level materials will be completed and available in 2006. In 2007, DOE will produce the next-level training package and in 2008 it will develop hands-on training. In addition, DOE has developed a hydrogen incident database that is now available at www.h2incidents.org, and a hydrogen bibliography, which is now available at www.hydrogen.energy.gov/biblio_database.html.

Comments and questions

M. Callan: wonders about concerns with OSHA

Refueling stations are a major risk area. In training there should be a demonstration of hydrogen properties. Props should also be used in training.

Questions about the level of communication between the vehicle and the pump during refueling – how advanced is the technology?

P. Davis: will develop more fully before the general public has access.

The time spent on refueling is also an issue – it takes a long time to refuel a vehicle currently.

State or local legislation may be required to issue a certification for station operators

B. Summers: Attendants should absolutely be required at stations if there is no shut-off mechanism

Discussion on the goals of today's meeting

Mike Callan

Mr. Callan noted that the following must be included in a modular program: fire, spills, first aid, extrication and identification.

Mr. Burns stated that modular is a good method, but all alternatives should be taught in one curriculum. The dissemination of materials in rural areas is a problem, as is updating information because of rapidly changing technology. Current delivery systems cannot move information far enough, fast enough. The core curricula are Awareness: "simple" properties of the hazards, recognition, initial standard operating procedures, when is it IDLH – is help needed from manufacturers to determine when operations should be offensive or defensive? Regarding Emergency Responder Operations, there is a need to decide the core elements. It should be institutionalized at the state level. Additional scenarios should be added (e.g.,

stationary fuel cell, vehicle idling on side of the road). A comprehensive website with training materials is needed.

B. Davis: an overview manual of all fuel types should be compiled.

R. Napoli: the delivery system for training already exists, we just need the training. In the creation of the curriculum this group must define the audience, define the product, and supply the product.

Information on the New Mexico Fire Training Academy

The facility is a “bread and butter” facility. They have found that high turnover in the fire service creates high demand for entry-level training. Hydrogen will fit easily into their curriculum – they already have a fossil fuel training program. New Mexico is a state with many transportation issues, and hydrogen will be a concern for them. They can accommodate logistics and other physical requirements and their training is open to all emergency responders (police, etc.).

Next Steps

The Emergency Responder Safety group will draft a plan that includes recommendations on an alternative fuels emergency responder safety curriculum as well as strategies for rapid dissemination and use of the curriculum. Mr. Callan will work with members of the group to produce a draft analysis and recommendations.

In accordance with HELP procedures, this draft will be posted on the HELP website as soon as it is available and otherwise distributed to permit input from all HELP members. The draft will be discussed and improved at the August HELP meeting, and may be posted for consideration as an adopted best practice at the Fall HELP meeting.