



DOE Hydrogen Program

Hydrogen Safety: First Responder Education

Marylynn Placet
Pacific Northwest National Laboratory
June 12, 2008

This presentation does not contain any proprietary, confidential or otherwise restricted information.

Project ID: ED-2

**Pacific Northwest
National Laboratory**
Operated by Battelle for the
U.S. Department of Energy

Overview

Timeline

- ▶ Project start date: 10/2004*
- ▶ On-going
- ▶ Percent complete, FY08: ~70%

Budget

- ▶ Funding in FY06: \$325K
- ▶ Funding in FY07: \$490K
- ▶ Funding in FY08: \$300K
(100% DOE funded)

* Pre-FY06 funding came from another part of the Safety, Codes and Standards program element.

Barriers Addressed

- ▶ Lack of Readily Available, Objective, and Technically Accurate Information
- ▶ Mixed Messages
- ▶ Disconnect Between Hydrogen Information and Dissemination Networks
- ▶ Lack of Educated Trainers and Training Opportunities

Partners

- ▶ PNNL is working with the Volpentest Hazardous Materials Management and Emergency Response (HAMMER) Training and Education Center on education and outreach



Pacific Northwest National Laboratory
U.S. Department of Energy

Objectives

- ▶ Long-term Objective:

Support the successful implementation of hydrogen and fuel cell demonstration projects and market transformation by providing technically-accurate and objective information about hydrogen to first responders*

- ▶ Objective for FY08:

Develop and disseminate first-responder hydrogen safety educational materials, including an update of the awareness-level course (first launched in FY07) and a more in-depth, one-day course

*Focus is on first responders (fire, law enforcement, and emergency medical personnel), who must know how to handle potential incidents; their understanding can also facilitate local project approval.

Approach in FY08

▶ Task 1: Awareness-Level Course (95% complete)

Update the stand-alone, interactive, web-based “awareness-level” course -- “Introduction to Hydrogen Safety for First Responders”

(This also creates an information set that others can draw from to supplement their ongoing or planned hydrogen/FCV education programs)

▶ Task 2: Awareness-Level Outreach (60% complete)

Conduct outreach activities related to the “Introduction to Hydrogen Safety for First-Responders” course, and disseminate related materials

▶ Task 3: Prop-Based Course (70% complete)

Develop and pilot a more advanced course that uses a mobile hydrogen fuel cell vehicle prop (developed in a companion project funded under the Hydrogen Safety, Codes and Standards program element)

Key Milestones & Deliverables

Task 1: Updates to Awareness-Level course complete

Due: March 2008

Status: Complete

Task 2: Awareness-Level course webinar

Due: November 2007

Status: June 2008

Task 3: First Pilot Test of Prop-Based Course

Due: June 2008

Status: Awaiting completion of the prop and final curriculum

Pre-FY08 Accomplishments: Awareness-Level Course

- ▶ Awareness-level course developed, reviewed, piloted and launched in January 2007
 - <http://hydrogen.energy.gov/firstresponders.html>
- ▶ Reviewed by over 100 representatives from the hydrogen and emergency-response communities
- ▶ Initial announcements to a broad list of first-responder organizations (state firefighter training centers, IAFF, IAFC, etc.)



April 2006 pilot

Course Overview


Address <http://www.ehammertraining.us/energy/hydrogen/controller.cfm> Go Links >>

Introduction to Hydrogen Safety for First Responders

U.S. Department of Energy
Hydrogen Program
www.hydrogen.energy.gov

COURSE MATERIALS LIBRARY EXIT ▶

Hydrogen Basics Transport & Storage Hydrogen Vehicles Hydrogen Dispensing Stationary Facilities Codes & Standards Emergency Response Summary



INCREASE YOUR
H₂IQ
www.hydrogen.energy.gov

The Course Materials cover the following topics:

- Hydrogen Basics
- Transport & Storage
- Hydrogen Vehicles
- Hydrogen Dispensing
- Stationary Facilities
- Codes & Standards
- Emergency Response

You can view the topic modules in sequence or select them in random order using the top navigation bar.

A short quiz follows at the end of the course. User responses will be collected but will not be attributed to you as an individual.

Begin the Course ▶

Done Internet

Accomplishments in FY08: Task 1 – Awareness-Level Course Update

- ▶ Re-formatted course in Flash “Captivate” software
- ▶ Developed a new video on hydrogen properties
- ▶ Created oral voiceover of transcript, so viewers can listen instead of read
- ▶ Added randomly-generated quiz questions
- ▶ Addressed a few technical questions raised by industry experts
- ▶ Included a certificate of completion
- ▶ Launched new site, hosted on PNNL webserver

Awareness-Level Course: Usage and Feedback

- ▶ Total unique visitors from 04/01/07 to 03/31/08 (old version) = 3964 (Total since 01/24/07 launch = 6192)
- ▶ About 1700 repeat visitors (04/01/07 to 03/31/08)
- ▶ Visitors from almost every state and many foreign countries (from Argentina to Venezuela)
- ▶ Many government, industry and university viewers
- ▶ New version just launched

"Very informative presentation for the fire service! Good Job!"

*Don Godfrey E27C
Sacramento Metropolitan Fire
Protection District, California*

"Excellent program!"

*Samuel A. Giordano Jr.
Director of Training
Roselle Fire Department
Roselle, Illinois*

Accomplishments in FY08: Task 2 –Outreach

- ▶ Full version of *new* awareness-level course on CD available for free from DOE/EERE Information Center; approx. *1500* of the older version distributed in first half of FY08
 - 877-EERE-INFO or 877-337-3463
- ▶ *Web-cast* of the *new* awareness-level course
- ▶ Three major first-responder *conference* events to raise awareness about hydrogen safety and about the DOE-sponsored courses
 - Fire Department Instructor's Conference, April 8-12, Indianapolis
 - Firehouse Expo, July 24-29, Baltimore
 - Fire Rescue International, August 14-16, Denver
- ▶ *Laminated poster* and *Firehouse Magazine article* with critical response information for distribution to firefighters – about *2000* of each distributed in first half of FY08

Accomplishments in FY08: Task 3 – Prop-Based Course

Interviews of ten directors at selected regional firefighter training centers in CA, CT, FL, MI, NY, SC, and TX

- ✓ Do they send people to offsite training?

Most said yes, for specialty training

- ✓ Have they had training on alternative vehicles?

60% said no; some had training on hybrid auto extrication, CNG, LNG

- ✓ Are they familiar with DOE Hydrogen Program?

70% said no

- ✓ Would they be interested in Hydrogen/FCV training?

100% said yes

- ✓ Are they willing to host live prop-based training at their facility?

Almost all said yes

- ✓ Would they be interested in sending someone to a train-the-trainer course?

Almost all said yes

Accomplishments in FY08: Task 3 – Prop-Based Course

Steering committee formed; met at HAMMER in October 2007. Includes:

- ✓ OEMs – Ford and General Motors; Plug Power
- ✓ Energy companies – Shell and Chevron
- ✓ Hydrogen/FCV organizations – California Fuel Cell Partnership and NextEnergy
- ✓ Firefighting organizations – Washington Fire Training Academy and local Washington State fire departments
- ✓ Experts from Los Alamos, Sandia and Lawrence Livermore National Labs

Accomplishments in FY08: Task 3 – Prop-Based Course

- ▶ Prop-Based Course currently being reviewed by steering committee
- ▶ Modules:
 1. Introduction and Course Overview
 2. Hydrogen and Fuel Cell Basics
 3. Hydrogen-Fueled Vehicle Systems
 4. Hydrogen-Related Stationary Facilities
 5. Standard Operating Procedures
 6. Practical Exercise
 7. Quiz
 8. Hands-On Exercise with FCV Prop
- ▶ Work with Washington State Fire Marshal's office to pursue official endorsement through the National Fire Academy's State Fire Training Course Endorsement Program (or another endorsing organization)

Future Work

- ▶ Continue to address comments and to field questions on the Awareness-Level Course
- ▶ Complete planned outreach activities for Awareness-Level Course (conferences, distribution of materials)
- ▶ Pilot the Prop-Based Course and conduct train-the-trainer sessions at HAMMER
- ▶ Conduct Prop-Based Course in appropriate forums in FY09
- ▶ Produce video-taped version of the prop-based course to allow wider dissemination

Project Summary

- ▶ **Relevance** – Education of first responders is a critical element of introducing hydrogen and fuel cell technology
- ▶ **Approach** – Develop and disseminate education materials that pertain to hydrogen safety, aimed at the first-responder audience
- ▶ **Accomplishments** – Web-based awareness-level course revised and new version launched. New hydrogen properties video developed. Webinar of awareness-level course (June 2008). Draft of prop-based, one-day course completed and under review.
- ▶ **Future work** – Continue to maintain, refine, and disseminate awareness-level course and related materials. Complete prop-based course, secure endorsement, pilot the course, and begin giving the course to first responders nationwide.