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PNNL-SA-86615

Hydrogen Emergency Response Training for First Responders

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May 14, 2013

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SCS015

Overview

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Timeline

- Project start: October 2004
- Continuing

Barriers*

A. Safety Data and Information: Limited Access and Availability

D. Lack of Hydrogen Knowledge by Authorities Having Jurisdiction (AHJs)

E. Lack of Hydrogen Training Materials and Facilities for Emergency Responders

Budget

- Funding Received in FY11: $100K
- Funding Received in FY12: $ 75K
- Planned Funding for FY13: $ 50K

Partners

- Hanford Fire Department
- California Fuel Cell Partnership
- Volpentest HAMMER Training and Education Center

** Technical Plan – Safety, Codes, and Standards, Section 3.7.5, Multi-Year Research, Development and Demonstration Plan, 2012*

Relevance: Goals and Objectives

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- **Long-Term Goal**
  - Support the successful implementation of hydrogen and fuel cell technologies by providing technically accurate hydrogen safety and emergency response information to first responders*
- **Objectives for FY13**
  - Offer the one-day operations-level course utilizing DOE's fuel cell electric vehicle (FCEV) prop at appropriate fire training centers
  - Continue to support the web-based awareness-level course (launched in FY07)
  - Outreach activities (e.g., disseminating first-responder hydrogen safety educational materials at fire training conferences) to raise awareness

* *First responders (fire, law enforcement, and emergency medical personnel) must know how to respond to potential incidents. Their understanding can also facilitate local approval of hydrogen projects.*

Approach

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- **Introduction to Hydrogen Safety for First Responders**
  - Support and update as needed the web-based awareness-level course “Introduction to Hydrogen Safety for First Responders”
- **Hydrogen Emergency Response Training for First Responders**
  - Transport the FCEV prop offsite and deliver the operations-level course at training centers across the U.S. where fuel cell vehicles and infrastructure are concentrated
    - FY13 focus was on Hawaii where new fuel cell deployment projects are currently in progress

Introduction to Hydrogen Safety for First Responders

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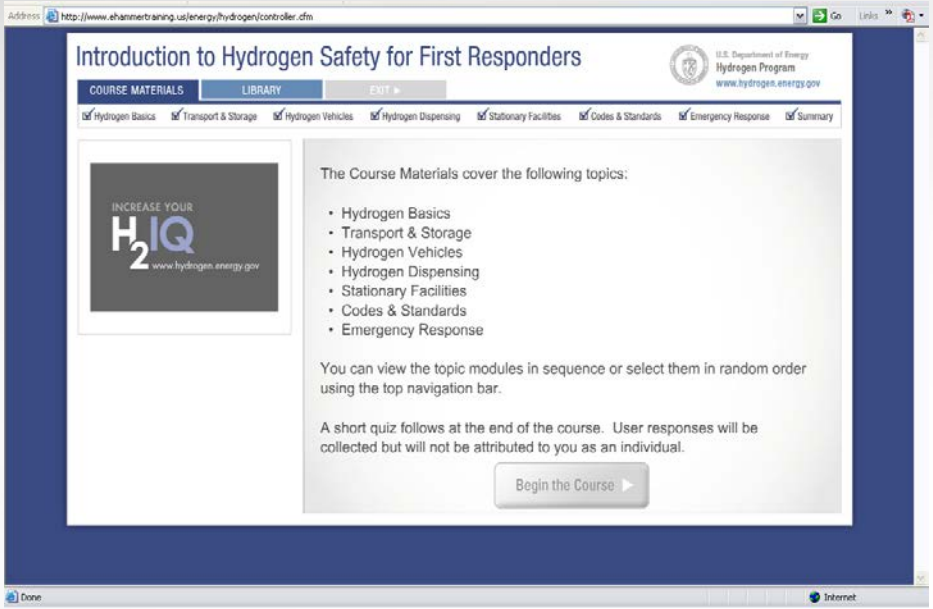
- Course Content
  - Hydrogen Basics
  - Transport and Storage
  - Hydrogen Vehicles
  - Hydrogen Dispensing
  - Stationary Facilities
  - Codes and Standards
  - Emergency Response
- The course is registered on the TRAIN* website for broader dissemination to first responders

**TrainingFinder Realtime Affiliate Integrated Network (TRAIN) is a central repository for public health training courses. Almost 30,000 TRAIN users are emergency responders.*



http://hydrogen.pnl.gov/FirstResponders/

Accomplishments/Progress
Introduction to Hydrogen Safety for First Responders

- Our website still averages ~200 to 300 unique visits per month after more than 6 years (on track for slight increase this FY), from nearly every state and some foreign countries

Fiscal Year	Visits
2007	6192
2008	3984
2009	4230
2010	3614
2011	2734
2012	2669
2013 (thru Feb)	2205
Total	**25628**

Hydrogen Emergency Response Training for First Responders

- Classroom Content
  - Hydrogen and Fuel Cell Basics
  - Hydrogen Vehicles*
  - Stationary Facilities*
  - Emergency Response
  - Incident Scenarios
- Demonstrations/Hands-on Exercise with FCEV Prop
  - Demonstration of Hydrogen Flame Characteristics
  - Student Participation in Rescue Evolutions

* Updated information for FY13

Multiple instructors for classroom training

A "rescue" at Sunnyvale (CA) Department of Public Safety

Accomplishments/Progress

Hydrogen Emergency Response Training for First Responders

Since May 2012 *(AMR)*

- Presented project overview at Hydrogen Safety Panel annual meeting Feb 5, 2013, Honolulu, HI
- Held training sessions at two fire training facilities in Hawaii
  - February 6-8, 2013
    Honolulu, Isle of Oahu
  - February 12-14, 2013
    Hilo, Isle of Hawaii

First Responders
HI State Energy Office
HI Dept of Emergency Mgmt
Nat'l Parks Service
Contractors

Accomplishments/Progress

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Agency	Location	Date	Number Trained
HAMMER	Richland, WA	2009 - 2010	66
Rio Hondo Comm. College	Santa Fe Springs, CA	August 2010	103
Orange Co Fire Authority	Irvine, CA	August 2010	92
Sunnyvale PSD	Sunnyvale, CA	September 2010	110
San Joaquin DLA	Stockton, CA	June 2011	41
Los Angeles City Fire Dept	Los Angeles, CA	January 2012	128
Los Angeles Co Fire Dept	San Dimas, CA	March 2012	170
Honolulu Fire & Fed Fire-HI	**Honolulu, HI**	**February 2013**	**155**
HI Co Fire & Volcanoes NP	**Hilo, HI**	**February 2013**	**135**
		Total to Date:	***1000***

Collaborations

- California Fuel Cell Partnership
- Hanford Fire Department
- HAMMER Training and Education Center
- Kidde Fire Trainers

Collaborations (cont.)

- Hawaii Natural Energy Institute, University of Hawaii
- Hawaii State Fire Council

Proposed Future Work

- Investigating site visits to facilities in California, possibly East Coast
  - Prepare collaborative agreements to provide training at these sites
  - Prop to be transported to sites in its trailer, stay at each site for one week
  - Anticipate three classes per site; ~100-150 first responders from each site

Future Work: The Possibilities for Enhancing and Expanding Training

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- Enhance content for both awareness and operations courses
  - Develop virtual hydrogen incident scenarios and responses
  - Add content to web-based course to introduce materials handling equipment; stationary, portable, and auxiliary power fuel cell units
  - Enhance operations-level course with updated information
- Expand reach of this training opportunity
  - Explore collaboration with other agencies and organizations, e.g., DOT, IAFC, FEMA
  - Train cadre of additional instructors
- Exhibit at fire-related conferences to help target new sites by:
  - Disseminating educational materials (CDs, posters, and other information),
  - Raising awareness of our hydrogen safety training

Summary

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- **Introduction to Hydrogen Safety for First Responders**
  - Available online at: http://hydrogen.pnl.gov/FirstResponders/
  - Still being successfully utilized, especially useful for ops course preparation
- **Hydrogen Emergency Response Training for First Responders**
  - Very successful delivery in Honolulu and Hilo, HI to multiple AHJs
  - Reached different groups, received positive feedback, they want us back
  - Planning to take course to other sites, possibly east and west coast, in 2014
- **Outreach**
  - Attend fire-related conferences (FDIC, FRI, FirehouseWorld) to disseminate materials and identify interest among first responder agencies for future classes

This training continues to make a positive impact with first responders, and is becoming a vital tool as we see an increase in the number of deployment projects.

My Thanks To:

- U.S. Department of Energy
  - Sunita Satyapal, Program Manager
  - Ned Stetson, Will James, and Nha Nguyen: Safety Codes and Standards Team
- My Instructors
  - Jennifer Hamilton (CaFCP)
  - Capt. James Bryan (Hanford Fire)
  - Scott Jones (HAMMER)
- All our great hosts this year in the Hawaii fire service
- University of Hawaii, Hawaii Natural Energy Institute
  - Mitch Ewan, Hydrogen Systems Program Manager

Technical Backup Slide

Publications and Presentations

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- Fassbender, L.L. 2009. "Hydrogen Emergency Response: Training for First Responders" (Training Manual), PNNL-18495, Pacific Northwest National Laboratory, Richland, WA.
- Weiner, S.C., "Hydrogen Safety Training for First Responders," Istituto Superiore Antincendi (Fire Prevention Institute), Rome, Italy, October 5, 2010.
- Fassbender, L. L. January 2011. "*Hydrogen Safety Training for First Responders*." www.hydrogenandfuelcellsafety.info/2011/jan/firstResponders.asp (Written for the Fuel Cell and Hydrogen Energy Association.)
- Elmore, M.R., Fassbender, L.L., Hamilton, J.J., and Weiner, S.C. "Hydrogen Emergency Response Training for First Responders." (Presented at 4th International Conference on Hydrogen Safety. San Francisco, CA. September 12-14, 2011.)