

## Phase Two: Moving Forward

- Focus on designing and implementing the hazardous materials distance learning training system, and its curriculum. This system will be built on the foundation of information gathered into the Phase One report.
- During Phase Two, the project staff will continue fostering collaborative relationships with stakeholders so that resources can be shared and the optimal training materials can be put forward without duplication of efforts. Existing training materials will be incorporated as the course is built.
- Phase Two seeks to build an online training course for first responders by creating a useful and accessible learning environment with a system that can reach a variety of learning styles and preferences.
- To ensure the appropriate resources and personnel are involved in building the online training system; the project will open for proposals through an RFP. This creates an opportunity for third parties to indicate how they can assist the project with their resources and expertise in online learning, while still being cost efficient.
- Throughout Phase Two, the project will tap into the mind of various first responders by consulting with not only samples of first responders who work in the field, but also touching base with the wide range of stakeholders in the first responder training community.
- In addition to designing and implementing an online hydrogen training course for first responders, Phase Two will also include some initial evaluation as beta testing will be performed at the end stages

### Staff Biographies:

**John Woulfe** is Assistant Director of National Programs and Consulting Services for the International Association of Fire Chiefs (IAFC).

Prior to starting at IAFC Headquarters, John Woulfe was Fire Chief in Rumford, Maine, where he served nearly 10 years. During his tenure as Chief, he served as President of the Maine Fire Chiefs Association for two years and was the State Vice President for the New England Division of the IAFC.

He has a Bachelor of Management Technology from Charter Oak College, Hartford, Connecticut. He is a certified Fire Instructor and an Honorary Battalion Chief in the Fire Department of New York (FDNY).

**Veronique Nagle** has been working with the IAFC since May 2005 in various capacities. She has worked in the Member Services Department, the Finance and Administration Department, and the National Programs and Consulting Services Department. In her current role with National Programs and Consulting Services, Mrs. Nagle serves as the Program Manager working with a team on the Hydrogen Fuels Training and Education Research Project.

Mrs. Nagle has recently graduated with a master's in Public Administration from George Mason University.

**Jennifer Dietz** started working with the International Association of Fire Chiefs in June 2009 as an intern for the National Hazardous Materials Fusion Center. Ms. Dietz currently serves as a Program Coordinator for the Hydrogen Fuels Training and Education Research Project.

She received her master's in Public Administration from George Mason University in May 2009.



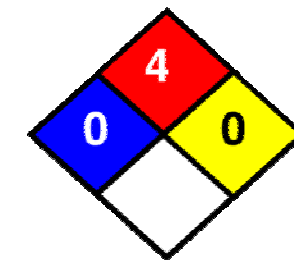
# Hydrogen Fuels Training & Education Research Project

The *Hydrogen Fuels Training and Education Research and Outreach Project* (project) is part of an ongoing partnership between the IAFC and the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA); the project is funded by the Research and Innovative Technology Administration (RITA). The objective of the project is to research and examine distance-learning training systems and strategies that focus on hydrogen and hydrogen fuel cell technologies; to prepare for the design and implementation of a hazardous materials distance-learning training system.

### Mission:

To research and develop a distance learning training system beginning with a hydrogen and hydrogen fuel cell technologies training module to create the pathway for the critical concept of responder training enhancements.

A component of the National Hazardous Materials Fusion Center, the Hydrogen Fuels Training and Education Research Project seeks to enhance hazmat responder safety by providing these personnel with training and information on responding to incidents involving hydrogen and hydrogen fuel cells. The first responder community must adapt to a changing environment that includes new alternative fuels.



### Project Contacts

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## Overview

### ***Problem & Needs Statement***

There are about 800,000 underserved responders in the first response community who staff over 90% of America's fire departments (Stittleburg 2002). Hydrogen is an alternative fuel gaining momentum in the economy just as ethanol was several years ago. However, hydrogen training is competing with a variety of other topics. In order to keep in the forefront with these other opportunities, hydrogen training needs to be robust to cover various learning styles to keep users engaged. It is imperative to get ahead of the curve to comply with federal law mandates.

Hydrogen generators have experienced a steady increase in use, due in large part to this emerging energy's ability to lower emissions and improve fuel economy. The rapid growth in hydrogen use is only expected to increase given the current economic state.

Initially, content developed for the learning system will focus on hydrogen and hydrogen fuel cell technologies. However, the system will be scalable and will grow proportionally as the need for additional training topics arises. Likewise, it will expand in feature and function as technologies mature and develop. While the training will be targeted to the volunteer first responder community, all individuals in the first responder community would have this training available to them.

### ***Project Goal and Purpose Statement***

The underlying goal of this project is to prove the concept of a distance learning approach for training the volunteer first responder community by utilizing the topic of hydrogen and hydrogen fuel cell technologies as the subject matter for training. The purpose of the project is to train the first responder community on hydrogen and hydrogen fuel cell incidents with a special focus on the hard-to-reach volunteer responders.

## Phase One: Research

### ***Purpose Statement***

The purpose of phase one of the demonstration project was to determine baseline responder knowledge, understand gaps and needs, and research existing training curriculum and technologies; to develop recommendations on the best approach in providing a distance learning training system.

### ***Defining Audience***

The target audience for receiving the training are the volunteer and combination departments across the United States who need training, taking into account four training environments (home, fire station with informal group, formal class with a remote facilitator, formal class with on-site facilitator). These first responders have a range of time constraints to consider including balancing full-time jobs, home life, fulfilling their response obligations and complete various mandated training.

### ***Objectives***

The objectives of the report are to identify the needs and requirements of an online distance training system, recognize techniques that will keep the audience engaged and to describe hydrogen fuels training that is currently available. The report also provides recommendations on the most effective platform(s) and distance learning system(s) capable of delivering hazardous materials training throughout the nation, as well as give a recommendation on knowledge methodology to enhance responders' hazardous materials skills. These recommendations are supplemented with analysis on how the chosen knowledge methodology will help support compliance to the National Fire Protection Association's (NFPA®) 472 standard and fill gaps, both current and future, in alternative energy hazmat education and training. The paper summarizes requirements and proposes an approach for hydrogen training, along with making general recommendations that are based on the research, but does not suggest any particular brand or vendor for future development efforts.

### ***Approach***

To conduct due diligence for this phase, a qualitative research approach was taken. The process began with problem identification, and subsequent development of a purpose statement and creation of research questions. A variety of methods were used to collect information: a literature review was performed; meetings with the state training directors and hazmat team leaders were held; meetings with other organizations representing various industries transpired; a request for information was sent out to the industry; and data was collected, analyzed and interpreted.

## Phase One: Findings

No difference was found in the student achievement measures of online versus on-campus students.

The use of online education can, in many cases, eliminate the need for employees to attend out-of-town training, or at least greatly reduce the frequency of that necessity and provide even greater savings of training resources.

The flexibility of time, place, and programs offered via web-based training is appealing to learners who are trying to balance training and education with work and home responsibilities.

Discussions from the regional meetings did not reveal any state-based hydrogen specific training or courses; however, several states indicated that hydrogen was a piece, or addressed in some way, as a part of a larger training course. In terms of training produced by federal agencies or industry, hydrogen-specific courses were recognized, but none of the training programs identified were designed specifically to be NFPA® 472 compliant.

The eSUCCESS framework, which represents a fusion of theory and practice of a select group of e-Learning leaders, is an appropriate theoretical framework for the development of the distance learning training system for volunteer first responders.

In developing and delivering instructional content, e-Learning research discusses the need to use multiple learning strategies that accommodate individual differences and learning styles.

Gaps exist between the actual conditions regarding hazardous materials training for the first responder community and what the stakeholders consider to be the optimal state of affairs.

## Phase One: Recommendations

The findings of this research led to the recommendation to build a training system that utilizes the resources of online distance learning to deliver hydrogen fuel curriculum, with the acknowledgement that this system should be scalable so it can be later used to encompass and deliver other alternative fuels and hazmat training. Using hydrogen curriculum as a model, a scalable system should be built that will be expandable to encompass other hazmat training, such as alternative fuels.

- Put into practice a framework of eSUCCESS around the project to ensure victory throughout development by making sure that key players are involved, the content is strong, it is built with the intended users in mind, and it creates a stimulating learning environment.
- Leverage critical partnerships with federal, state, local and industry stakeholders on the development of the training system and training curriculum.
- Implement a spiral model development philosophy to allow the system to grow over time as needs and resources increase.
- View future development as two distinct tasks: distance learning training system development and hydrogen courseware development.
- Consider the Open Source market for a new Learning Management Systems (LMS) solution.
- Set high standards for courseware design that support learner engagement, asynchronous and synchronous collaboration, interactivity, multi-media and adult learning principles based on the findings in the Phase One research.
- Incorporate quality management for system design that support tools, collaboration, tracking and scalable technology infrastructure based on the findings in the Phase One research.
- Adhere to federal standards for development of information technology (SCORM, Section 508).

## Phase One: Final Report

The findings and recommendations along with the details of actions taken during the Phase One research can be found in the Final Report that was submitted to PHMSA and is now available to the public. The entire Final Report can be found at the National Hazardous Materials Fusion Center Website ([www.hazmatfc.com](http://www.hazmatfc.com)) under 'Hazmat Resources' in the 'Other Resources' section.