

Emergency Responder Training for Advanced Electric Drive Vehicles

Final Report

Prepared by:

Andrew Klock

Senior Project Manager
National Fire Protection Association
Quincy, MA 02269

© June 2013 Fire Protection Research Foundation



THE
FIRE PROTECTION
RESEARCH FOUNDATION

FIRE RESEARCH

THE FIRE PROTECTION RESEARCH FOUNDATION
ONE BATTERYMARCH PARK
QUINCY, MASSACHUSETTS, U.S.A. 02169-7471
E-MAIL: Foundation@NFPA.org
WEB: www.nfpa.org/Foundation

(This page left intentionally blank)

FOREWORD

On-going programs and related initiatives by the U.S. federal government are promoting the proliferation of the next generation of electric vehicles. This is accelerating the manufacturing and deployment of electric drive vehicles. An important consideration for the implementation of this new technology is the potential hazards that may result, and how the emergency response community will address and mitigate those hazards.

The goal of this project is to provide comprehensive awareness and emergency response training to fire fighters and other emergency responders to prepare them for widespread implementation of advanced electric drive vehicles, including battery electric, hybrid electric, and certain fuel-cell electric vehicles. The objectives of the project include enhancing general awareness training, emergency response tactical training, and establishment of a centralized resource for nationwide ongoing technology transfer. This project report provides a compilation of information that documents the efforts taken to meet these objectives.

The Research Foundation expresses gratitude to the report author Andrew Klock of NFPA and his support team. Special thanks are expressed to the U.S. Department of Energy as the project sponsor.

The content, opinions and conclusions contained in this report are solely those of the author.

(This page left intentionally blank)

PROJECT TECHNICAL PANEL

Gregg Cleveland, NFPA Fire Service Section, La Crosse Fire Dept., La Crosse WI

John Cunningham, NAFTD, Nova Scotia Firefighter's School

Rich Duffy, IAFF, Washington DC

Gregory Frederick, NFPA/IAFC Metro Chiefs, Louisville Fire/Rescue., Louisville, KY

Bill Giorgis, Michigan Towing Association, Mike's Wrecker Service., Saginaw, MI

Terry McDonnell, New York State Police, Albany, NY

Larry McKenna, USFA, Emmitsburg MD

Jim Narva, NASFM, National Association of State Fire Marshals

Steve Pegram, IAFC & ISFSI, Goshen Township Fire & EMS, Goshen OH

Al Rosamond, NVFC, Hixon TN

Tony Sanfilippo, IFMA, Michigan Bureau of Fire Services

Daniel Bates, New York State Police, Albany, NY (alt to Terry McDonnell)

Jim Carroll, NAFTD, CT Fire Academy (alt to John Cunningham)

Karen Deppa, NASFM, (alt to Jim Narva, NASFM)

Victoria Lee, IAFC, Fairfax VA (Alt to Steve Pegram)

Ron McGraw, IAFF, Washington DC (alt to Rich Duffy, IAFF)

PROJECT SPONSOR

U.S. Department of Energy, through the NFPA



(This page left intentionally blank)

National Fire Protection Association

**ELECTRIC / HYBRID
VEHICLE SAFETY
TRAINING FOR
EMERGENCY
RESPONDERS**



*Andrew Klock
Sr Project Manager
May 01, 2013*

National Fire Protection Association
Andrew Klock, Sr. Project Manager
DE-EE0002009

May 2, 2013
FINAL PUBLISHABLE REPORT



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



National Fire Protection Association – FINAL TECHNICAL REPORT

Final Version / May 2, 2013

U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles

Primary Recipient: National Fire Protection Association, Andrew Klock, Sr. Project Manager

Project Start Date: February 1, 2011

Project End Date: January 31, 2013

Classification

This report is: *Check all that is applicable...*

Draft

Final

Internal

Public

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>

Recipient Address and Contact Information

Andrew Klock, Sr. Project Manager

1 Batterymarch Park

Quincy, MA, 02169

617-984-7089 (phone)

617-984-7528 (fax)

aklock@nfpa.org

National Fire Protection Association

1 Batterymarch Park

Quincy, MA, 02169

617-770-3000 (phone)

617-770-0700



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



TABLE OF CONTENTS

1. Executive Summary.....	Page 4
2. Introduction.....	Page 5
3. Objectives of the Project.....	Page 8
a. Project Scope.....	Page 8
b. Project Goals.....	Page 8
c. Approach.....	Page 9
d. Original Objectives and Accomplishments.....	Page 23
e. Project Management.....	Page 23
f. Milestone Summary.....	Page 23
g. Research.....	Page 32
h. Education Offerings.....	Page 32
i. Job Creation.....	Page 38
4. Project Results.....	Page 38
a. Results Overview.....	Page 38
b. Paid Advertisements Results.....	Page 40
5. List of Deliverables.....	Page 41
6. Financial Overview.....	Page 42
7. Continued Plans for Dissemination.....	Page 43
8. Sample Materials Developed.....	Page 44
9. Sample Media Coverage.....	Page 52
10. Earned Media Coverage.....	Appendix A



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



Executive Summary:

Early in the first term of President Barack Obama's administration, a goal of putting one million advanced electric vehicles on the road by 2015 was established. As car manufacturers, government officials and the public worked to make this goal a reality, there was a potential road block — the perceived fear that electric and hybrid vehicles would be more dangerous to drivers and first responders if involved in a crash.



With that in mind, the U.S. Department of Energy awarded the National Fire Protection Association (NFPA) a grant to provide nationwide training and education support to fire fighters and other first responders. Without such training, the operators of these vehicles and first responders themselves could be at increased risk. If questions or misconceptions arose about the safety of electric vehicles in emergency situations, the adoption of electric vehicles — and ultimately the number of EVs on the road — would be hindered. To respond to this challenge over the last three years, NFPA developed comprehensive awareness training programs, including safety videos, animations and reference material, and made them available throughout the country to our nation's first responders, in a variety of formats and mediums to reach as many as possible. Along with classroom train-the-trainer and online training programs, on-scene quick reference materials were also produced, all accessible from a specially designed web portal that has quickly become the source of EV safety for all U.S. Emergency Responders, vehicle manufacturers and the public alike. To support this effort, NFPA has partnered with all of the major auto manufacturers that sell hybrid and electric vehicles in the U.S., as well as six respected fire service subject matter experts in extrication, vehicle rescue and hybrid technology. NFPA also worked with the Fire Protection Research Foundation (FPRF), all of the major North American Fire Service Organizations, including the International Association of Fire Fighters (IAFF), the International Association of Fire Chiefs (IAFC), the National Volunteer Fire Council (NVFC), the International Fire Marshals Association (IFMA), the National Association State Fire Marshals (NASFM), the Metro Fire Chiefs, the United States Fire Administration (USFA), the North American Fire Training Directors



(NAFTD), the International Association of Chiefs of Police (IACP), the National Sheriffs Association (NSA), the New York State Police (NYSP), the Society of Automobile Engineers (SAE), The Department of Transportation (DOT), The National Highway Transportation and Safety Administration (NHTSA) and the American National Standards Institute (ANSI). First steps included first responder research and needs



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



assessment conducted across the country, the launch of a nationwide communications and awareness campaign, the hiring of a curricula development team responsible for many National Fire Academy (NFA) training programs, and a state of the art web site developer and online training design team began work on the new EV web portal, training programs and reference materials. These steps allowed advanced electric/hybrid vehicle safety to initially be disseminated to the fire service, and later in the project, to the law enforcement and EMS communities. NFPA’s depth of experience in working directly with emergency responders in safety, and developing and administering training courses throughout the country allowed the necessary resources, tasks, and milestones to be implemented that guaranteed completion of this vital project to be accomplished on time and on budget, while developing a highly engaging, quality training experience centered around this new technology.

The results were unprecedented as a plan was implemented to cascade these classroom and online, state of the art training programs through the firefighter divisions and ranks across the nation -- over 30,000 emergency responders were successfully trained in 48 states, and the EV/Hybrid emergency on-scene quick reference manual was distributed to over 3,200, while NFPA’s monthly EV Safety Newsletter circulated to an audience of over 22,000, and the web portal was visited 135,000 times in the first two years. Next, a law enforcement classroom training and video was developed with the assistance of the New York State Police, and it was recently nominated for the State Police PACE award. NFPA is proud to acknowledge that emergency responders are now well on their way to having a better understanding of electrified vehicles and how to safely handle them in emergency situations across the United States of America.



Introduction:

In 2013, 2.3 million hybrid and electric passenger vehicles were on U.S. roads (hybridcars.com), and over the next five years that number is expected to quadruple. Pike Research predicts Hybrid Electric and Plug in Electric Vehicles will account for over five percent of total U.S. vehicle sales in 2017 (NavigantResearch.com “Electric Vehicle Market

Forecasts”), followed by exponential growth as the technology becomes less expensive. In Boston Massachusetts alone, half of the taxi cabs today are hybrid vehicles, and by 2015 the goal is to have all hybrid cabs in the city. Despite the growing popularity of Electric Vehicle (EV) and Hybrid Electric (Hybrid) technology, NFPA determined that the emergency responder community was inadequately prepared to handle incidents involving these electrified vehicles and applied for a U.S. Department of

Training Alignment with NFPA Standards

- NFPA 1500: Occupational Safety & Health Standards for Fire Fighters
- NFPA 1001: Fire Fighter Professional Qualifications Series
- NFPA 1600: Disaster Planning and Emergency Preparedness
- NFPA 472: Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents
- NFPA 1670: Standards for Technical Rescue Incidents
- NFPA 921: Fire Investigation
- National Electrical Code®
- Article 625: Electric Vehicle Charging Stations
- Article 628: Electrified Truck Parking Spaces
- Article 220: Residential power consumption and how EV charging infrastructure will effect power consumption and emergency responders



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



Energy (DOE) grant to produce training for first responders in the electric/hybrid vehicle arena. NFPA is currently the ANSI accredited national codes and standards developer for emergency responder qualifications, equipment and tactics, as well as the codes and standards developer for vehicle fueling. Our National Electrical Code® (NEC®) has established standards for EV charging stations, electrified truck parking spaces and the impact of the EV charging infrastructure on power consumption and on emergency response. Consequently, DOE awarded NFPA a \$4.4 million three year grant in February of 2009 to develop and distribute nationwide responder training on Hybrid and EV incidents.



Initially, NFPA set out to research the emergency responder communities to find out what their level of knowledge was on this subject and how best to train a vast emergency responder community, including the 1.2 million paid and volunteer U.S. fire fighter force. In early 2010, NFPA worked with DOE to identify the first adopter cities and target those areas. NFPA then held 17 nationwide first responder focus groups, and phone surveyed 425 training officers on their level of EV knowledge in crash situations, as well as what topics should be taught

and how and where the training would be best received. It was quickly determined that only a small fraction of the fire service had received any training on any of these new technologies and that training and reference material should be developed in every possible form, including classroom, hands-on, virtual, online self paced courses, reference cards, books and PDFs to meet the varied needs of both the paid and volunteer responder communities throughout urban and rural locations. It was also determined that online web based training and an 'App' were not going to have as much impact as first believed, because through the qualitative and quantitative studies, it was learned that many fire stations across the country did not have or did not permit internet access and did not allow smart devices to be used at accident scenes.

The next step NFPA took was to form an Emergency Responder Technical Advisory Panel, consisting of executive level representatives from every major fire service organization across the country. Then a search was conducted and contracts were established with six first responder subject matter experts having extensive experience in EVs, Hybrids, high voltage fires, battery technology and extrication rescue procedures, who in turn helped identify electric and hybrid vehicle risks, procedures and safe methodologies. This input formed the topics and formats that emergency responders deem critical to their training material, and is found today throughout NFPA's deliverables.

HV Battery Breach

- Watch for unusual odors or eye, nose, throat, or skin irritation. If detected, limit exposure and evacuate.
- Monitor HV battery for leaks, sparks, smoke, flames or gurgling sounds. Notify all responders and the manufacturer.
- Follow local medical protocols in the event of exposure to electrolyte or fumes.





U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



Through the SMEs and the Emergency Responder Technical Panel, it was determined that the impact of hybrid and EV crashes involves potential fatalities and serious on-scene injuries to both responders and the vehicle occupants, as well as the possibility of post-incident injury, death, or property damage to investigators and tow and salvage personnel. The potential dangers identified from crashes of these vehicles include stranded energy, unexpected silent movement, toxic and flammable gases emanating from a damaged high voltage battery, thermal runaway, battery fires, and the possibility of electric shock through exposed high voltage wires and components, as well as charging station events. These hazards are well documented and are outlined in NHTSA's "Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped with High Voltage Batteries", which NHTSA developed during this project, in consultation with NFPA electric vehicle (EV) subject matter experts and our Public Fire Protection Division.

It should be noted that this new hybrid and EV technology has not been found by the Department of Transportation (DOT) to be inherently more dangerous to first responders and the public than conventional gasoline internal combustion engine vehicles, but emergency responders simply haven't had the training and the experience dealing with electrified vehicle incidents, in comparison to the 100 years of education and familiarity with internal combustion vehicles. Therefore NFPA's charge was clear – produce excellent, engaging training and proliferate it through every channel and medium possible as to obtain the greatest distribution of EV safety knowledge, in order to protect the emergency responder communities and the public.

Over the past three years, NFPA focused much time and resources into developing a train-the-trainer program, classroom and online curricula, multiple videos and a quick reference manual which includes extrication information, to keep fire fighters safe when working at crash scenes. NFPA capitalized on the proven strategies and successes of its highly respected codes and standards training program development and



implementation, to produce some of the nation's most effective and most disseminated emergency responder training on alternative fueled vehicles available, in order to get ahead and stay ahead of the wave of the new electrified vehicles being released on America's roadways.

The following report details how these NFPA training initiatives are providing the knowledge necessary to keep emergency responders and the public safe, as well as recapping the achievements in training, deliverables, media coverage, and overall highlights of this three year effort.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



Objectives of Project

A) Project Scope

The project's vehicle scope is limited to Electric Vehicles (ex: Nissan Leaf), Plug-in-Hybrids (ex: Chevrolet Volt) and the Hybrid Electrics (ex: Toyota Prius). The scope of awareness and tactical methodologies includes emergency operation procedures, high voltage vehicle safety systems and the vehicle charging stations (EVSE). This program does not include electrified trucks, buses, fleet vehicles, motorcycles, fuel cell or natural gas powered vehicles.



B) Project Goals

This project's objective was to develop and make readily available comprehensive awareness response training and reference materials to United States emergency responders, in order to prepare them for their role in the safety infrastructure of advanced electric drive and hybrid electric vehicles. This objective focuses on reducing firefighter and civilian death and injuries; and removing any concerns the fire service may have for the deployment of electric drive vehicles. This will help pave the way for EV and Hybrid vehicles to begin to proliferate on America's highways.

The goals of this program include:

- Provide emergency responders with general awareness training.
- Develop and deliver emergency response tactical training.
- Establish a centralized methodology and resource for nationwide ongoing technology transfer.
- Establish improved communications between the auto manufacturers and the responder communities, in order that safety information would be constructed and conveyed more effectively; and manufacturers would more readily consider responders' safety and concerns regarding future vehicle designs.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



NFPA also set out to work with public and private enterprise, as well as government safety organizations and branches to help keep everyone working towards the same safety goals and moving in the same direction. NFPA set out to partner with DOE, DOT, NHTSA, SAE, ANSI, all the major U.S. fire service organizations, law enforcement organizations, insurance companies and towing associations, to assist with setting safety guidelines for this new technology across the boards.

Relevance: Project Objectives

- Provide comprehensive nationwide EV Safety Training Programs for use by U.S. Fire Service (1+ million).
- Create NFPA Emergency Responder Web Portal for national EV Safety Training, events, news and OEM info.
- Create a quick reference on-scene EV Field Guide.
- Make specialized program available to Law Enforcement.
- Cultivate a sustainable program to address future alternative-fuel vehicle safety concerns.

As the communications campaign was developed in spring of 2010, the goals included the following:

- Drive awareness of electric vehicle training among first responders.
- Encourage the need and importance of the training.
- Produce high participation rates in the training.
- Elevate NFPA's reputation as a leader in the fire safety and first responder communities.
- Expand the public's awareness of NFPA as a thought leader on public safety issues.

C) Approach

A major concern of emergency responders regarding the introduction of any new vehicle technology is the lack of a consistent, independent source of reliable information and training on safety. With NFPA's goal now set to provide this vital safety training to an entire country's emergency responders, it was necessary to utilize multiple formats of information that are consistent with how first responders are accustomed to receiving training.

1) Web Portal – www.EVSafetyTraining.org

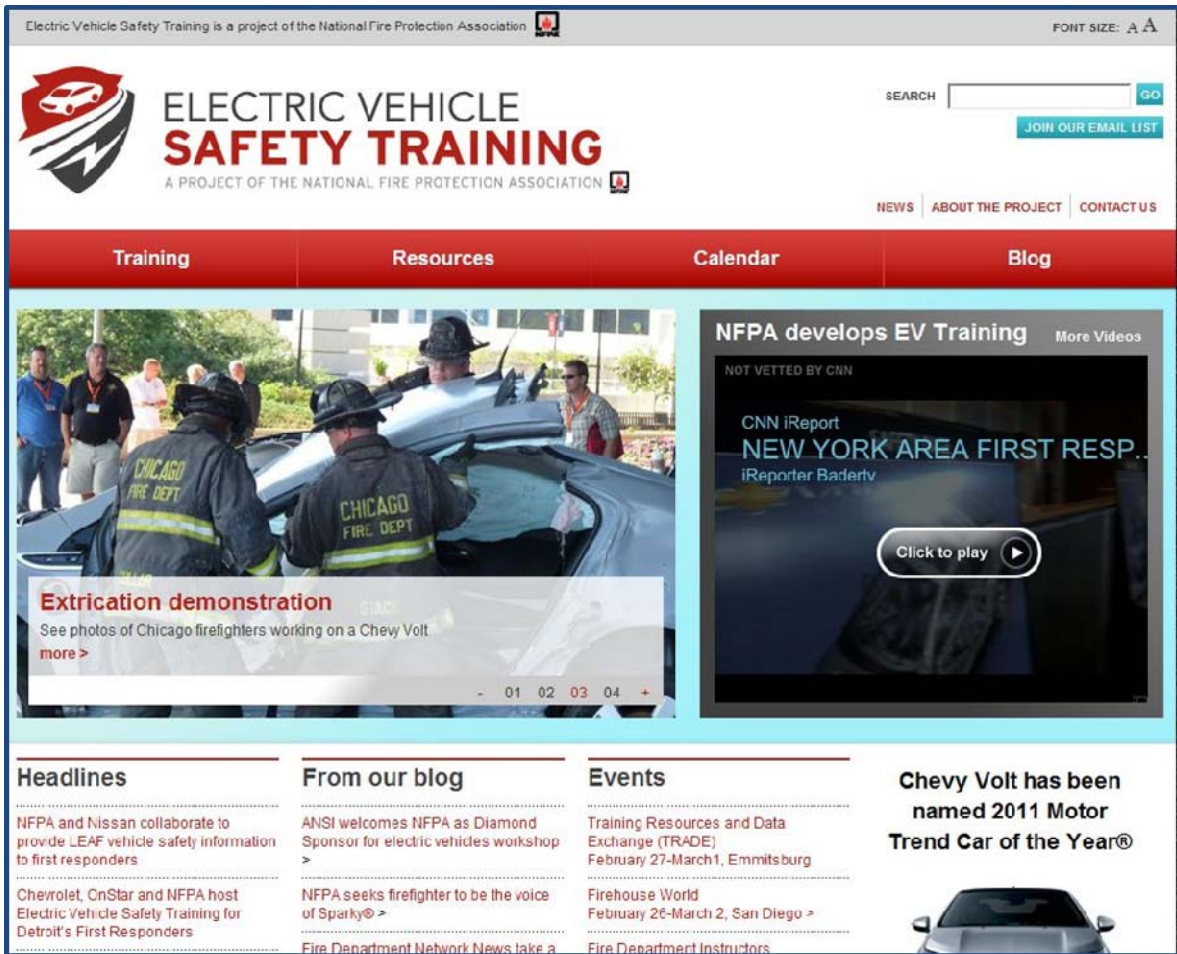
First and foremost, this initiative included building a website to serve as a hub for emergency responder training and the dissemination of information associated with electric/hybrid vehicles. Two firms were hired to develop this site – the first to design it, and the second to build it. This interactive website would include multiple e-learning components, downloadable reference material, training videos, and a separate page for each vehicle manufacturer to post their Emergency Response Guides, safety information and videos. The online modules on this site offer 24 hours/day access to multiple training programs, video content and documented safety guidelines.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



General Motors was enthusiastic about the site and the ability to store their Emergency Response Guides and videos there for responders, that they asked NFPA to speed up the implementation plan, which was done.



Website design:

- A team of web designers worked closely with NFPA’s team to design wireframe documents for the project website that would reflect the overall campaign strategy and content. Recognizing that the website would be first responders’ gateway to information regarding this training, the website was designed in a way that would provide easy information about the main topics that were relevant to first responders:
 - Information about the project.
 - Information about how to sign up for trainings.
 - Easily accessible and downloadable content and resources that could be used by members of the first responder community.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



- In addition to designing the wireframes, a recommended approach for driving traffic to the website through search engine optimization and potential pay-per-click opportunities were also developed.

Blog Content

- To help position the newly launched program as a leader for industry expertise in electric vehicle emergency response, the training website hosted a blog featuring commentary and training information from subject matter experts. Subject matter experts worked to provide ongoing newsworthy commentary for posting to ensure that the blog would continue to become a destination for the industry and establish NFPA as a thought-leader in the field.

Calendar of Events

- A calendar was designed into the portal, so it could be updated easily and allows the viewer to quickly see when the next series of EV events were taking place across the country. The events included conferences, trade shows, and any events that NFPA was hosting or attending, including the fire service state trainings schedule.

Resources

A resources section of the portal provides a separate area for each auto manufacturer who partners with NFPA. The pages allow vehicle ERGs to be posted and any other responder safety information the Original Equipment Manufacturer (OEM) would like to publicize. Manufacturers have posted their emergency response guides, extrication videos, white papers, news stories and links to other EV sites. This feature allows emergency responders to have a central location to find safety information from any manufacturer, without having to navigate through each OEM's website.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



2) Communications Campaign

The second step was to find and hire a communications firm and begin a communications campaign. Just as NFPA's training program included multiple forms of outreach — in-person, in-print and online — Fleishman-Hillard was hired to design a campaign that integrated key program elements to achieve the results sought out by NFPA.

The campaign was built around the following elements:

- Building a campaign around a core set of compelling messages which speak directly to the key audiences NFPA has identified.
- Developing a plan, communications tools and materials that would not only encourage participation in the training, but also mobilize advocates among key constituent groups.
- Conducting outreach through relevant trade, association, news and social media outlets.
- Media and promotional support surrounding state-level and online electric vehicle training opportunities.



In addition to reaching firefighters and other first responders, our outreach also focused on others who were not likely to respond to potential emergency situations involving electric vehicles (the public) but whose awareness of the training and safety measures were critical to the overall acceptance of new electric and hybrid vehicles.

Branding - Name and Logo

To support the communications campaign, a name was developed for the campaign (Electric Vehicle Safety Training), as well as a logo and a set of key messages for the campaign.



Our messages focused on driving awareness and communicating the need for the training among first responders, why this training is necessary and why it is important now.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



Testing

In an effort to better understand what would catch the attention of first responders and motivate them to enroll in the new electric vehicle safety training project, a 90-minute web-based focus group with six first responders was conducted. As part of the discussion, first responders provided feedback about their preferred information sources and proposed campaign elements, including names, logos and messages.

Based on the feedback received during the focus group — coupled with the feedback received from NFPA, the Fire Protection Research Foundation, the emergency responder technical panel and a presentation delivered at the June 2010 NFPA Conference — the messages, name and logo were finalized.

Materials Development

From the program’s inception, it was clear that there would be a need for materials across multiple platforms to ensure the program delivered a consistent look, theme and message to the many different audiences.

Key messages

To drive awareness and action among the fire service and other first responders, strong marketing messages, based on core messages, needed to be employed in target media through earned and paid placements. Core messages were developed about the project, the training’s importance and the details of the training as well. Where possible, these messages were followed with proof points.

Reactive messages

Since the program’s inception in 2010, the electric vehicle market has not stopped evolving. As developments within the industry were made, messages were regularly updated so that subject matter experts would be able to answer all questions with accuracy and confidently address any changes that had been made with both training participants and with the media.

Post Cards

A series of post cards to hand out at conferences and other EV events were developed that would concisely promote the training and convey the key messages surrounding electric vehicle safety. NFPA goal with these



This project is funded with a grant from the U.S. Department of Energy





U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



handouts was to inform emergency responders that they now had a centralized repository of EV/Hybrid safety information and to point them to NFPA's EV website.

Conference & Trade Show EV Exhibitions

NFPA exhibited and/or presented at targeted fire and law enforcement conference and trade shows to raise the awareness of NFPA's website, training & reference materials.

Fact Sheets, FAQs

As messages and other essential materials for the program were developed, Facts sheets and FAQ documents were created, that were simple, one-page materials that could be easily distributed within media kits to provide media with the important background of the training. In many on-site media situations, these materials allowed reporters to quickly get up-to-speed about the program, helping them to immediately dive into the importance of the training project.

Press releases, media advisories

Throughout the duration of the program, there was much to be shared with both trade audiences and the general public. As these milestones, events and developments occurred, news and details of all these items were continually distributed so that the program would remain on first responders' minds and awareness would spread among consumers.

The National Fire Protection Association and Kansas Fire & Rescue Training Institute Bring Electric Vehicle Safety Training to Kansas

June 15, 2012—First responders from Kansas will now have the opportunity to learn more about key guidelines for responding to emergency situations involving electric and hybrid vehicles. The National Fire Protection Association (NFPA) and the Kansas Fire and Rescue Training Institute, a division of KU Continuing Education, will host an electric vehicle safety training session for Kansas first responders on Saturday, June 16.

The course will be held at Nichols Hall on the University of Kansas campus in Lawrence and is part of NFPA's Electric Vehicle Safety Training Project that was recently developed to prepare for the growing number of electric and hybrid vehicles on the roads today. The session will feature a live demonstration with a Mitsubishi iMiEV and a Lincoln MKZ Hybrid provided by [Laird Noller Automotive](#), a Nissan Leaf provided by [Briggs Nissan](#) and a Chevrolet Volt provided by [Ed Bozarth Chevrolet](#).

The state-level, train-the-trainer course began touring state training systems in the summer of 2011. To date, training sessions have been completed in 30 states, with the goal of reaching first responders in all 50 states by the end of 2012. Participants in each state will be able to take what they have learned to prepare other first responders throughout the state.

"Kansas first responders are eager for the opportunity to learn about this important topic, as they are seeing more and more of electric and hybrid vehicles in the line of duty," said Glenn Pribbenow, director of the Kansas Fire and Rescue Training Institute. "NFPA's comprehensive training course will equip attendees with the proper information to educate firefighters throughout Kansas about electric vehicle safety and emergency response."

For more than 100 years, NFPA has been a leading voice for public safety. The Electric Vehicle Safety Training Project is based on extensive research and findings from the Fire Protection Research Foundation. Since the launch of the project, NFPA has collaborated with top safety experts and automobile manufacturers to provide a comprehensive curriculum of up-to-date information on the topic.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



Social Media Outreach and Digital Support

- Social media was also important in spreading the word quickly and cost-effectively about the EV Safety Training. Using NFPA’s existing Facebook, Twitter and YouTube presence, the message about the EV training was spread directly to first responder audiences and others who are active on social media channels.
- Tweets, Facebook updates and YouTube videos were used to support major announcements such as upcoming trainings, the launch of the online training and partnerships with automotive manufacturers. While the majority of Facebook shares or re-tweets came from fire trade publications and members of the first responder community active on social media channels, several traditional media and automotive groups also shared the content with their respective followers.

Advertisements

Following the finalization of the program logo, print advertisements, online banners, online site introduction displays, online page peel advertisements and customized email blasts were created with a consistent message, look and feel.



3) Content Development

The third step was to develop the content of the training by identifying the risks and best practices for responders and the public with electrified vehicles. This was done by utilizing research from the Fire Protection Research Foundation, DOE’s research, NFPA’s Public Fire Protection Division experts, our contracted SME experience and vital information supplied by the auto manufacturers. Material from all of these sources were collected and categorized, and many SME round table meetings were held until the core program content was hammered out and documented.

4) Classroom Curricula Development

The fourth step included working with an experienced curricula developer, who had previously developed multiple training programs for the National Fire Academy. A series of meetings took place with the curricula developer, their contracted SMEs, NFPA’s staff and our contracted SMEs in order to forge the training outlines, topics and delivery methods.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



5) Chevy Volt Classroom Training Development

During the EV Safety Training course development, it was learned that General Motors was planning a country wide first responder training tour, to educate the fire service, law enforcement and EMS on the safety features and safety procedures to use in a Volt Electric Vehicle incident. NFPA met with GM and proposed that this be a joint venture, and GM was amiable to partnering with NFPA on this endeavor. As a result of this first automotive manufacturer partnership, over 2,200 responders were trained nationwide, not only on the Chevrolet Volt, but on many Hybrid and EV vehicle safety principals that applied to many vehicles that were on the road at that time. GM then asked NFPA to put together online training for their new Volt vehicle, which presented an opportunity to provide Volt specific, as well as general EV safety knowledge to responders in advance of NFPA's larger programs which were about six months from completion. It should be noted that NFPA provided the same opportunity to produce the same type of vehicle specific online EV/Hybrid training to other domestic and international car manufacturers, however, after serious discussions, others did not obtain approval to invest the time and resources required and turned down our offers.



6) Online Training Development: Chevy Volt and EV/Hybrid Safety Program

The next step was to find and contract a state of the art online training development organization. This was accomplished by hiring a team of SMEs to conduct an extensive search throughout the e-Learning industry. After choosing an organization, work began first on the Chevrolet Volt course, developed with the close partnership of a GM team assigned to oversee the content. The course used cutting edge videos, graphics, animations, simulations and a learning management system (LMS), with quizzes and tests built in. The course was a resounding success and had thousands of first responders participating within the first few months after its release.

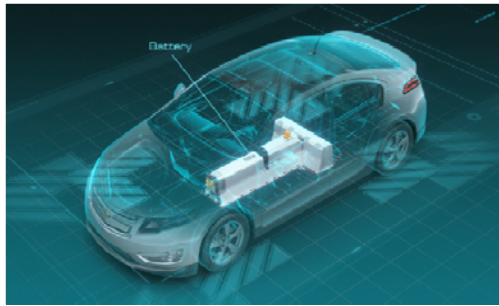
EV / Hybrid and Chevrolet Volt Online Courses



- To reach Emergency Responders who do not have easy access to classroom training programs
- Covers the same material as the classroom course with one for one match to classroom units
- High Quality graphics, animations, and simulations.
- Includes self-contained Learning Management System that will track, record and report on student completions.



U.S. Emergency Responder Safety Training for Advanced Electric Drive Vehicles



Seeing the ongoing monumental results of the Chevrolet Volt online safety course, the same format and style of engaging videos, graphics, animations, simulations, scenarios, testing (which now had the questions randomized) and an LMS was built in and the content was expanded to include everything in the EV/Hybrid classroom curricula. The full, online, web based

self paced course was release in June of 2011 and receive high praised from all who piloted the program, including the emergency responder technical panel and selected fire service personnel nationwide.

7) Classroom Training: Pilots and Release

As the Curricula Vendor completed the EV/Hybrid Safety Classroom Training, NFPA scheduled five pilot programs at strategic fire academy locations in EV/Hybrid metro areas were advanced electric drive vehicles were being released. Successful pilots took place at:

- Oregon Fire Chiefs Association Training in Salem, Oregon on April 14, 2011
- Tualatin Valley Fire and Rescue in Sherwood, Oregon on April 18, 2011
- Phoenix Fire Department Training Academy in Arizona on April 26, 2011.
- Austin Fire Department in Texas on April 28, 2011.
- Maryland Fire and Rescue Institute on May 1, 2011.

The classroom program was modified based on the feedback obtained from these pilots, and then the class was presented to the emergency responder technical panel, where it received the highest marks. The program was deemed ready for release by NFPA, and the first official class took place at the Massachusetts Fire Academy on July 28, 2011 to a class size of over 80. The reviews gave the program the highest marks, and many of the fire service in attendance were saying the program was one of the best train-the-trainer programs ever offered at the academy.