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National Fire Protection Association
ELECTRIC VEHICLE SAFETY FOR EMERGENCY RESPONDERS

**Timeline**
- Start – February 2010
- End – February 2013
- 42% complete

**Barriers**
- Fire Service lacks standardization in training and has inconsistent technology/internet accessibility

**Partners**
- International Association of Fire Fighters (IAFF)
- International Association of Fire Chiefs (IAFC)
- National Volunteer Fire Council (NVFC)
- International Fire Marshals Association (IFMA)
- National Association of State Fire Marshals (NASFM)
- Metropolitan Fire Chiefs
- U.S. Fire Administration (USFA)
- North American Fire Training Directors (NAFTD)
- Alliance of Automobile Manufactures (AAM)
- General Motors, Nissan, Ford, Tesla
- Assoc of International Automobile Manufactures (AIAM)
- National Renewable Energy Lab (NREL)
- National Highway Traffic and Safety Association (NHTSA)

**Budget**
- Total project funding
  - DOE share: $4,354,135.
  - Contractor’s share: $1,088,534.

**DOE Funding Received**
- 2010: $1,923,169.
- 2011: $429,837*

*(Through February 2011)
Objectives: Relevance

- Increasing fuel prices are driving greater consumer demand for electric and hybrid vehicles.
- Hybrid vehicle sales for February 2011 increased **39%** compared to February 2010.*
- Hybrid vehicle sales in February 2011 were **19.5%** higher than the previous month (January 2011).*
- Toyota forecasts selling its one millionth Prius in the U.S. in 2011.*
- Experts predict cumulative total of 2 million hybrid / electric vehicles in the U.S. in 2011.*

* Statistics courtesy of Hybridcars.com
Objectives: Relevance

Program Objectives

- Develop and Implement a comprehensive Training Program and Field Guide for Electric Drive Vehicles, to keep first responders prepared and public safe.
- Reach 1 million fire service members nation-wide.
- Cultivate a lasting, sustainable program to address future alternative-fuel vehicle safety concerns.
- Create NFPA Emergency Responder Web Portal for all EV safety training and info.
2011 Objectives

- Deploy instructors for Train-the-Trainer sessions through State and Metro training systems.
- Launch e-learning online EV Safety Course.
- Implement sustainability revenue model to support program and job longevity.
- Complete online interactive Flagship training module for Chevrolet Volt.
**Objectives: Relevance**

**Job Creation**

- 4 Full-time NFPA Staff positions created, 1 retained.
- 7 Subject Matter Experts/Consultants hired.
- Numerous jobs created/retained through employing vendors and subcontractors.
  - Fire Protection Research Foundation
  - ATEC, Burning Visions
  - Fleishman-Hillard
  - Chadwick Martin Bailey
  - University of Missouri Fire & Rescue Training Institute
**Approach: Milestones**

- **Project Planning Complete**
- **Q2**
  - 1st Responder Research (qualitative/quantitative)
  - Setup Fire Service Technical Panel
  - Hire Training Development Team (ATEC)
  - Hire Video Team
  - Nationwide 1st Responder Volt Tour
  - Video Shoot (NV, NH)

- **Q3**
  - Hire Web Development Firm (Velir Studios)
  - Hire SME Team (Content Formation)
  - Alliance with GM, Tesla, Nissan, Ford
  - Hire Flagship Training Development (ATEC)

- **Q4**
  - Project Kickoff Meetings
  - Hire Communications Firm (Fleishman Hillard)
  - Web Portal Released (EVsafetytraining.org)
Approach: Project Scope
Model Years 2008-2012

Plug in Hybrids
Electric
Hybrids

Image courtesy of Porsche
Approach: Project Scope

Charging Stations (Level 1,2,3)
Approach: Training Delivery Model

NFPA EV Safety Website and Self-Paced Online Training

NFPA Train-the-Trainer (Train instructors each state)

University and Tech College Partners

Fire Service Organization Partnerships

State Fire Service Trainers

Fire Fighters in the Field
Approach: Emergency Field Guide
Approach: NFPA Standards Alignment

- 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 Electric Code
- Article 625: Electric Vehicle Charging Stations
- Article 626: Electrified Truck Parking Spaces
- Article 220: Residential power consumption and how EV charging infrastructure will effect power consumption and emergency responders
National Fire Protection Association
ELECTRIC VEHICLE SAFETY FOR EMERGENCY RESPONDERS

Progress: Milestones

- Hire Training Development Team (ATEC)
- Nationwide 1st Responder Volt Tour
- Hire Emergency Field Guide Developers
- Hire Video Team
- Web Portal Released (EVsafetytraining.org)
- EV Safety Video Release
- 4 Pilot Classroom Trainings Held
- Video Shoot (NV, NH)
- Completed Market Research (Qualitative)
- Alliance with GM, Tesla, Nissan, Ford
- Hire SME Team (Content Formation)
- Completed Market Research (Quantitative)
- Chevrolet Volt Online Training Released
- Hire 3 EV Safety Instructors (Train-the-Trainer)
Progress: 2011 Objectives

- Extrication demonstration
  - See photos of Chicago firefighters working on a Chevy Volt.
- NFPA develops EV Training
- CNN iReport
  - NEW YORK AREA FIRST RESP.
  - iReporter Badertv
- Responders Actions
- Scene safety (ABC's of extrication) - mission that has url, then get into V2V specific
- Size-Up
  - Scene survey (firefighter circle)
  - Identification
  - Emergency Field Guide

Examples of crumpled vehicle incidents where vehicle identification is difficult or unreliable
- Immobilize Vehicle
  - Approach vehicle from the sides
  - Stabilization of vehicle
  - Turn vehicle all
  - Check wheels
  - Set parking/emergency brake
  - Place vehicle into park
  - Consideration of electrical system deactivation
  - Possible Vehicle Vehicle Push-Down
Progress: Nationwide Fire Service Research

- 17 Qualitative Focus Group Studies Round Table Facilitated Discussions
- 425 Quantitative Studies Training Officer Focused Calls
- Research Foundation Study Report on EV & HEV for Emergency Responders & Incident Commanders
- Hired SMEs on HEVs & EVs Identified Areas for Training
Progress: Identified EV Risks, Procedures & Emergency Scenarios
Progress: EV Safety Deliverables

- GM/NFPA Nationwide Chevy Volt Safety Tour -- 2000 First Responders Trained
- 3-6 Hour Classroom Instructor-Led Course Package
- 8 Hour Train-the-Trainer Instructor-Led Course Package
- Online Self-Instructional Course
- Emergency Field Guide
- EV Safety Training Website
- Vehicle-Specific Online Training
Progress: Web Portal Release

Website: EVsafetytraining.org
Progress: GM Turns Over Training to NFPA

GM passes the torch to NFPA on EV Training

NFPA President Jim Shannon speaks at a press conference in Detroit and talks about NFPA’s role in providing electric vehicle safety training to first responders.
Progress: Instructor-Led Course

- 3-6 hours depending on optional activities
- **NFA style** Instructor Guide and Student Manual
- **Special Student Manual Option**...
  An alternative abbreviated four-page student manual, with condensed info-graphic content. Designed to reduce SM printing costs.
- **High Quality** media
- Teachable by any experienced fire instructor
Progress: Online Self-Paced Course

- Covers the same ground as the classroom course with one for one match to classroom units
- High Quality graphics, animations, and simulations.
- Includes self-contained LMS that will track, record and report on student completions
Progress: Emergency Field Guide

- Complete **electronic and print** reference data base for responders
- Indexed by **ALL** Hybrid and Electric Vehicles on the road and in production
- Contains system and construction characteristics and specifications, and **complete safe response procedures and guidelines.**
Collaboration: Project Partnerships

International Association of Fire Fighters (IAFF)
International Association of Fire Chiefs (IAFC)
National Volunteer Fire Council (NVFC)
International Fire Marshals Association (IFMA)
National Association of State Fire Marshals (NASFM)
Metropolitan Fire Chiefs
U.S. Fire Administration (USFA)
North American Fire Training Directors (NAFTD)

National Renewable Energy Lab (NREL)
National Highway Traffic and Safety Association (NHTSA)

Fire Service Technical Panel: assisting with needs assessment & direction for training development

Tech Questions, Trends, Stats, Safety Issues, Crash Test Results
Collaboration: Partnerships

- Alliance of Auto Manufacturers (AAM)
- Association of Intl Auto Manuf. (AIAM)
- Auto Manufacturers
  - General Motors
  - Nissan
  - Ford
  - Tesla
  - BMW
  - Volkswagen
  - Hyundai
Collaboration: Training Dissemination

- **Release** of the course from NFPA to state and metro training systems.

- **Classroom training impact reporting** from state and metro training systems to NFPA.

- **Online usage reporting** of student completions from NFPA to state and metro training systems.

- **Collaborative** evaluation and planning for updates and new programs to be provided from NFPA to state and metro training systems.
Future Work: Plans for 2011

- Finalize our Instructor-Led and Online Training Programs
- Complete the Development of Printed and Electronic Emergency Field Guide.
- Begin Hosting Train-the-Trainer session with State and Metro Training partners.
- Continue to Develop Partnerships with Auto Manufacturers and Fire Service Organizations.
- Work to Expand and Enhance our Web Portal, www.EVsafetytraining.org
Future Work: Remainder of Project

- Attend **Major Nationwide Fire Service Events** to Promote and Deliver our Training Programs.
- Execute a **Communications Blitz** through Fire Service Media, Online, Magazines, Ads.
- Conduct **Train-the-Trainer sessions** with State and Metro Fire Training partners.
- Develop **Revenue Stream** through sale of EV safety products and services to private industry.
- Use Revenue Stream to **Fund Training Deliveries** to Public Emergency Responder Agencies.
Future Work:
Vehicle-Specific
Online Instruction
Summary

**Relevance:** Effective EV knowledge transfer to Emergency Responders will reduce property damage, injury, loss of life, and help achieve public acceptance of high volume EV/Hybrid production in the U.S.

**Approach:** Through a carefully planned and executed development, partnership and distribution strategy, NFPA will offer high value, standards-based training programs, a centralized EV web repository, and an EV quick reference guide (EFG).

**Accomplishments/Progress:** Developed classroom and online EV safety training courses, videos, Emergency Field Guide (print and electronic), and EV safety web portal. Established numerous working partnerships with auto manufacturers to facilitate information flow, availability of EV safety related documents, and improvement of industry Emergency Response Guides.

**Collaborations:** Active partnerships with all high level U.S. fire service organizations, automobile manufacturers, and governmental agencies.

**Proposed Future Work:** Train state and metro fire trainers to deliver course content and curriculum throughout the Fire Service and First Responder community. Continue to develop Fire Service and automotive partnerships, while updating training programs and reference material to stay current with emerging technology.