



## Fire Service Research Summary NFPA and FPRF

### Selected NFPA reports\*

#### Statistical Analysis: Firefighter Fatalities

**Firefighter Fatalities in the United States 2009;** Rita F. Fahy, Paul R. LeBlanc and Joseph L. Molis, June 2010.  
Overall statistics on line-of-duty firefighter fatalities in 2009, including non-incident-related deaths. Includes patterns, trends, career vs. volunteer comparisons, and brief narratives on selected incidents. Also includes an analysis on U.S. fire service fatalities in structure fires for the years 1977-2009.  
Link to report: <http://www.nfpa.org/assets/files/PDF/osfff.pdf>

**U.S. Fire Service Fatalities in Structure Fires, 1977-2009;** Rita F. Fahy – NFPA,, June 2010.  
A review of the firefighter deaths that have occurred while operating inside at structure fires finds that death rates during operations outside at structure fires have decreased, while the rates of traumatic injuries during operations inside have not.  
Link to report: <http://www.nfpa.org/assets/files/PDF/osfff.pdf>

**Wildland Firefighter Fatalities, 1999-2008;** Rita F. Fahy – NFPA, July 2009.  
From 1999 through 2008, there were 169 deaths associated with 124 wildfires and 11 deaths associated with nine prescribed fires. For this analysis, the term wildland fire is used to include forest, brush and grass fires. Some of these are wildfires that may have initially been planned as prescribed fires, set either by a land management agency or a private property owner but then got out of hand. The number of deaths in any one year was as low as eight and as high as 26.  
Link to report: <http://www.nfpa.org/assets/files/PDF/OSWildlandFFF.pdf>

**U.S. Firefighter Fatalities in Road Vehicle Crashes, 1998-2007;** Rita Fahy – NFPA, July 2008  
This report on fire fighter fatalities in road vehicle crashes addresses 148 deaths of on-duty firefighters in 133 road vehicle crashes over the 10 year period of 1998 to 2007. The number of deaths annually ranged from a low of 10 in 1998 and 2006 to a high of 25 in 2003 and 2007.  
Link to report: <http://www.nfpa.org/assets/files/PDF/OS.FFVehicleDeaths.pdf>

**What's Changed Over the Past 30 Years?;** Rita F. Fahy, Paul R. LeBlanc and Joseph L. Molis - NFPA,, June 2007.  
A review of the almost 3,400 on-duty firefighter fatalities that have occurred in the U.S. between 1977 and 2006 shows some areas where significant improvements have occurred and highlights areas where much work remains to be done.  
Link to report: <http://www.nfpa.org/assets/files/PDF/whatschanged.pdf>

\*Go to website for complete listing, [www.nfpa.org/fireservicestatistics](http://www.nfpa.org/fireservicestatistics).

**U.S. Firefighter Deaths Related to Training, 1996-2005;** Rita F. Fahy – NFPA, June 2006

Training is a vital part of fire department operations, but it too often results in deaths and injuries. Between 1996 and 2005, 100 firefighters in the U.S. died while engaged in training-related activities (10 percent of all on-duty firefighter deaths). The deaths occurred during a broad range of activities, including apparatus and equipment drills; physical fitness; live fire training; underwater/dive training; and while attending classes or seminars.

Link to report: <http://www.nfpa.org/assets/files/PDF/OS.FFFtraining.pdf>

**U.S. Firefighter Fatalities Due to Sudden Cardiac Death, 1995-2004;** Rita F. Fahy – NFPA,, June 2005.

Sudden cardiac death claims more firefighter lives during on-duty activities than any other cause of death. This study reviews trends in these deaths between 1995 and 2004.

Link to report: <http://www.nfpa.org/assets/files/PDF/OSCardiacDeath.pdf>

**Selected Special Analyses of U.S. Firefighter Fatalities,** NFPA

A collection of special analyses of patterns of U.S. firefighter fatalities. Topics covered include career and volunteer comparison; tanker accidents; training; operating inside structures; incendiary and suspicious fires; responding to or returning from alarms; PASS use; being struck by vehicles; and structural collapses.

Link to report:

<http://www.nfpa.org/catalog/services/customer/downloadmemberonlypdf.asp?pdfname=osffanalysis.pdf&src=nfpa>

**Statistical Analysis: Firefighter Injuries**

**Firefighter Injuries in the United States;** Michael J. Karter, Jr. & Joseph L. Molis – NFPA, October 2010

This report includes statistics on line-of-duty firefighter injuries in 2008 from NFPA's survey of fire departments – including non-incident-related injuries, trends, and brief narratives on selected incidents.

Link to report: <http://www.nfpa.org/assets/files/PDF/OS.FFInjuries.pdf>

**Patterns of Firefighter Fireground Injuries;** Michael J. Karter – NFPA, May 2009

Includes 2003-2006 annual average estimates of injuries by such factors as type of injury, type of activity at time of injury, cause of injury by level of severity, occupancy where injury occurred, time of day and ages of injured firefighters.

Link to report:

<http://www.nfpa.org/catalog/services/customer/downloadmemberonlypdf.asp?pdfname=OS.patterns.pdf&amp;src=nfpa>

**Statistical Analysis: Fire Service Profile**

**U.S. Fire Department Profile;** Michael J. Karter and Gary P. Stein – NFPA,, October 2010

This report includes statistics through 2009 on the numbers and characteristics of U.S. of fire departments and firefighters. It also includes information on the number of fire stations, pumpers and ladders nationwide, rates of usage of such equipment by community size, and total national direct expenditures on local fire protection.

Link to report:

<http://www.nfpa.org/catalog/services/customer/downloadmemberonlypdf.asp?pdfname=OS.FDProfile.pdf&src=nfpa>

**Fire Service Performance Measures;** Jennifer D. Flynn – NFPA., November 2009

This report identifies and presents potential performance measures as they relate to the core functions of the fire department. A comprehensive literature review was performed to gather and highlight key measures that have already been identified. In addition to presenting key measures by fire department function, this report discusses the cautions associated with each measure.

Link to report: <http://www.nfpa.org/assets/files/PDF/OS.FSPerformanceMeasures.pdf>

**Statistical Analysis: Needs Assessment**

**Four Years Later – A Second Needs Assessment of the U.S. Fire Service;** Department of Homeland Security, USFA, and NFPA, October 2006.

Updated assessment of needs of U.S. fire service in such areas as training, certification, personnel, apparatus, equipment, and fire prevention, with particular attention to homeland security type incidents.

Link to report: <http://www.nfpa.org/assets/files/PDF/NeedsAssessment2NatlReportFA303.pdf>

**Matching Assistance to Firefighters Grants to the Reported Needs of the U.S. Fire Service;** Department of Homeland Security, USFA, and NFPA, October 2006.

Analysis of whether grants requested and received have addressed reported needs, by type of need, and whether popular types of grants have resulted in significant change in the overall national level of need.

Link to report: <http://www.nfpa.org/assets/files/PDF/MatchingAnalysisFinalFA-304.pdf>

**A Needs Assessment of the U.S. Fire Service;** FEMA, USFA, and NFPA, December 2002.

A comprehensive study done by FEMA, USFA and NFPA examining the needs and response capabilities of the U.S. fire service. Among the factors examined are personnel and their capabilities; fire prevention and code enforcement; stations, apparatus and equipment; and the ability to handle unusually challenging incidents. Results are reported by nationwide and community size.

Link to report: <http://www.nfpa.org/assets/files/PDF/needsassessment.pdf>

**State-by-State Findings of Four Years Later – Fire Department Needs and Response Capabilities,** Department of Homeland Security, USFA, and NFPA, January 2007

Updated assessment of needs of fire service in each of the 50 states, covering most areas addressed in the national report.

Link to location on NFPA.org:

<http://www.nfpa.org/categoryList.asp?categoryID=417&URL=Research/Fire%20reports/Fire%20service%20statistics>

**State-by-State Findings of Fire Department Needs and Response Capabilities;** NFPA, July 2004

This study is a state-level breakdown of a national study conducted by NFPA in 2002, which was commissioned by FEMA/United States Fire Administration for Congress. Among the topics covered is fire department readiness for four specified tasks: (1) rescue for collapse of buildings where there are at least 50 occupants; (2) hazmat and EMS response for a defined chemical/biological incidents; (3) response to a defined major wildland fire and (4) response to a developing flood.

Link to location on NFPA.org:

<http://www.nfpa.org/categoryList.asp?categoryID=417&URL=Research/Fire%20reports/Fire%20service%20statistics>

## Completed available FPRF reports

### Fire Service Research: Fireground Operations

**Risk Factors for Fire Fighter Cardiovascular Disease – Executive Summary**, Jeffrey L. Burgess - The University of Arizona (2010)

This study evaluates the use of carotid IMT as a medical surveillance tool in firefighters, measures the acute effects of fire suppression on biomarkers associated with heart attacks and tests an active cooling method during firefighter rehabilitation.

Link to report: <http://www.nfpa.org/assets/files/PDF/Research/RFCardioStudy.pdf>

**Quantitative Evaluation of Fire and EMS Mobilization Times**, Robert Upson and Kathy Notarianni – WPI (2010)

This study provides a quantitative evaluation of fire emergency and EMS mobilization times, and identifies key factors affecting their performance. It provides a statistical analysis of actual fire emergency and EMS alarm handling and turnout times based on data collected across a diverse representative population of North American fire service organizations.

Link to part I <http://www.nfpa.org/assets/files/PDF/Research/MobilizationPart1.pdf>

Link to part II <http://www.nfpa.org/assets/files/PDF/Research/MobilizationPart2.pdf>

Link to part III <http://www.nfpa.org/assets/files/PDF/Research/MobilizationPart3.pdf>

**Fire Fighter Safety and Emergency Response for Electric Drive and Hybrid Electric Vehicles**, Casey C. Grant – FPRF (2010)

This study focuses on electric drive and hybrid electric vehicles intended for roadway passenger use, and describes the variety of safety issues that these relatively new vehicles may present involving fire and/or rescue emergency situations either on the roadway or at charging/docking stations (e.g., garages).

Link to report: <http://www.nfpa.org/assets/files/PDF/Research/FFTacticsElecVeh.pdf>

**Fire Fighter Safety and Emergency Response for Solar Power Systems**, Casey C. Grant - FPRF (2010)

This study focuses on structural fire fighting in buildings and structures involving solar power systems utilizing solar panels that generate thermal and/or electrical energy, with a particular focus on solar photovoltaic panels used for electric power generation.

Link to report: <http://www.nfpa.org/assets/files/PDF/Research/FFTacticsSolarPower.pdf>

**Reaching the U.S. Fire Service with Hydrogen Safety Information: A Roadmap**, Casey C. Grant (2009)

This study provides an overview of the U.S. Fire Service to help improve the transfer of hydrogen safety information to and from the emergency response community. The information included in this report provides a better understanding of emergency first responders to facilitate efficient and effective transfer of hydrogen safety information.

Link to report: <http://www.nfpa.org/assets/files/PDF/Research/REPORT%20FINAL%20H2FS.pdf>

**Fire Fighting Tactics Under Wind Driven Conditions**, Daniel Madrzykowski and Stephen Kerber – NIST (2009)

This project provides real-scale data to guide the development of appropriate tactical options for use at structural fires under wind driven conditions. The technical information resulting from this study contributes to our understanding of the dynamics of fire phenomena and prediction of fire intensity and growth under wind driven conditions.

Link to part I: [http://www.nfpa.org/assets/files/PDF/Research/Wind\\_Driven\\_Report\\_Part1.pdf](http://www.nfpa.org/assets/files/PDF/Research/Wind_Driven_Report_Part1.pdf)

Link to part II: [http://www.nfpa.org/assets/files/PDF/Research/Wind\\_Driven\\_Report\\_Part2.pdf](http://www.nfpa.org/assets/files/PDF/Research/Wind_Driven_Report_Part2.pdf)

Link to part III: [http://www.nfpa.org/assets/files/PDF/Research/Wind\\_Driven\\_Report\\_Part3.pdf](http://www.nfpa.org/assets/files/PDF/Research/Wind_Driven_Report_Part3.pdf)

Link to part IV: [http://www.nfpa.org/assets/files/PDF/Research/Wind\\_Driven\\_Report\\_Part4.pdf](http://www.nfpa.org/assets/files/PDF/Research/Wind_Driven_Report_Part4.pdf)

**Fire Service Research: PPE**

**Thermal Capacity of Fire Fighter Protective Clothing**, NIOSH, NIST and NCSU (2008)

This project provides helpful information for manufacturers to determine if the choice of materials for a particular design of protective clothing increases or decreases the potential for a low heat flux burn injury. This information supports standards development activities at NFPA and ASTM based on the implementation of a stored energy test apparatus developed at North Carolina State University.

Link to report: [http://www.nfpa.org/assets/files/PDF/Research/PPE\\_Thermal\\_Energy.pdf](http://www.nfpa.org/assets/files/PDF/Research/PPE_Thermal_Energy.pdf)

**Respiratory Exposure Study for Fire Fighters and Other Emergency Responders**, Casey C. Grant (2007)

This study provides information for firefighters and other emergency responders to help develop best practice guidance for determining when to use and discontinue use of SCBA and other respiratory protective equipment. The applications of primary focus include atmospheres that are possibly hazardous yet tenable, such as during overhaul operations, fighting outdoor fires, or limited exposure situations.

Link to segment I: [http://www.nfpa.org/assets/files/PDF/Research/FF\\_RespExp\\_Report\\_\(Final\\_1\\_of\\_4\).pdf](http://www.nfpa.org/assets/files/PDF/Research/FF_RespExp_Report_(Final_1_of_4).pdf)

Link to segment II: [http://www.nfpa.org/assets/files/PDF/Research/FF\\_RespExp\\_Report\\_\(Final\\_2\\_of\\_4\).pdf](http://www.nfpa.org/assets/files/PDF/Research/FF_RespExp_Report_(Final_2_of_4).pdf)

Link to segment III: [http://www.nfpa.org/assets/files/PDF/Research/FF\\_RespExp\\_Report\\_\(Final\\_3\\_of\\_4\).pdf](http://www.nfpa.org/assets/files/PDF/Research/FF_RespExp_Report_(Final_3_of_4).pdf)

Link to segment IV: [http://www.nfpa.org/assets/files/PDF/Research/FF\\_RespExp\\_Report\\_\(Final\\_4\\_of\\_4\).pdf](http://www.nfpa.org/assets/files/PDF/Research/FF_RespExp_Report_(Final_4_of_4).pdf)

**Fire Fighter Protective Clothing Breathability Project Technical Report - Phase 2**, Roger Barker, Malcolm Bender, Jim Fowler, Guowen Song – NCSU, (1999)

The International Fire Fighter Protective Clothing Breathability Project has the aim of documenting the heat stress and comfort of several NFPA 1971 compliant turnout systems with a range of heat loss values. Phase 2 documents the effects of laundering on the total heat loss measured on the turnout materials.

Link to report: [http://www.nfpa.org/assets/files/PDF/Research/FPCB\\_Ph.1\\_Technical\\_report.pdf](http://www.nfpa.org/assets/files/PDF/Research/FPCB_Ph.1_Technical_report.pdf)

Link to appendix A-F: [http://www.nfpa.org/assets/files/PDF/Research/FPCB\\_Appendix\\_A-F.pdf](http://www.nfpa.org/assets/files/PDF/Research/FPCB_Appendix_A-F.pdf)

Link to appendix G-L: [http://www.nfpa.org/assets/files/PDF/Research/FPCB\\_Appendix\\_G-L.pdf](http://www.nfpa.org/assets/files/PDF/Research/FPCB_Appendix_G-L.pdf)

Link to appendix M-Q: [http://www.nfpa.org/assets/files/PDF/Research/FPCB\\_Appendix\\_M-Q.pdf](http://www.nfpa.org/assets/files/PDF/Research/FPCB_Appendix_M-Q.pdf)

**Fire Fighter Protective Clothing Breathability Project Technical Report - Phase 1**, Roger L. Barker, Barbara J. Scruggs, Chureerat Prahmsam – NCSU, Loren G. Myrhe, Melanie Teer, Tonya Miszko – Alamo Physiological Research Institute (1998)

The International Fire Fighter Protective Clothing Breathability Project has the aim of documenting the heat stress and comfort of several NFPA 1971 compliant turnout systems with a range of heat loss values. Phase

1 documents the use of the guarded sweating hot plate used for independent measurement of protective clothing ensembles.

Link to report: [http://www.nfpa.org/assets/files/PDF/Research/Ff\\_Protective\\_Clothing\\_Breathability\\_Ph.2\\_rpt.pdf](http://www.nfpa.org/assets/files/PDF/Research/Ff_Protective_Clothing_Breathability_Ph.2_rpt.pdf)

### **Fire Service Research: Fire Prevention**

**U.S. National Electric Vehicle Safety Standards Summit Summary Report**, Casey C. Grant - FPRF (2010)

Report of the U.S. National Electric Vehicle Safety Standards Summit held on 21-22 October 2010 in Detroit Michigan to address safety related codes and standards issues. The Summit focused on the fundamental codes and standards centric areas of: vehicles; built infrastructure; and emergency responders. The interests and concerns of emergency responders were directly addressed at this conference.

Link to report: <http://www.nfpa.org/assets/files/PDF/Research/RFUSNEVSSSummit.pdf>

**Measuring Code Compliance Effectiveness for Fire-Related Portions of Codes**, John Hall, Jennifer D. Flynn - NFPA, Casey C. Grant - FPRF (2008)

This project addresses code compliance effectiveness for fire-related portions of codes through a twofold approach that (1) refines the effectiveness measurement methods developed in the 1976 NFPA/UI study, and (2) enhances the detail and usefulness of the effectiveness measurement methodology. The goal of the project has been to develop a tool to measure how fire prevention activities of fire safety enforcement organizations can reduce fire risk in communities, where both *prevention* and *enforcement organization* are interpreted broadly. In addition, the project includes a component on Leadership in Life Safety Design (LLSD), which is a potential management tool directly related to the measurement of code compliance effectiveness.

Link to report: <http://www.nfpa.org/assets/files/PDF/Research/CCEReport.pdf>

**“Stop, Drop, and Roll” – The Technical Substantiation Behind Public Fire Safety Messaging**, Tiffney A. Cates and James A. Milke – University of Maryland, (2006)

The "stop, drop, and roll" (SDR) technique was designed to demonstrate how individuals should respond at the onset of clothing ignition. However, in recent years, suggestions regarding the slogan's revision have arisen. The goal of this study was to determine whether the original concept should be reassessed.

Link to report: [http://www.nfpa.org/assets/files/PDF/Research/SDR\\_Technical\\_Report.pdf](http://www.nfpa.org/assets/files/PDF/Research/SDR_Technical_Report.pdf)

**Incentives for the Use of Residential Fire Sprinkler Systems in U.S. Communities**, Newport Partners, (2010)

To evaluate the nature and impact of incentives, this research identified, characterized, and estimated the approximate value of sprinkler system incentives found in communities across the U.S. In-depth interviews were conducted with 16 communities that each offered one or more incentives to encourage the use of sprinkler systems in new single-family homes. The communities included in this study and their collective incentives help to establish a “toolkit” which other jurisdictions can draw from, as they consider strategies to encourage the use of residential sprinklers to improve life safety systems in new homes.

Link to report: <http://www.nfpa.org/assets/files/PDF/Research/RFIncentivesResidentialFireSprinklers.pdf>



**Engineered Lightweight Truss Roof Construction - International Bibliography**, Kirk Grundahl (1992)

This report provides a bibliography on engineered lightweight construction that serves as a basis for further technical analysis and helps to identify gaps in knowledge and test planning.

Link to segment I:

[http://www.nfpa.org/assets/files/PDF/Research/Engineered Lightweight Truss Roof Construction Bibliography\\_Segment\\_1.pdf](http://www.nfpa.org/assets/files/PDF/Research/Engineered_Lightweight_Truss_Roof_Construction_Bibliography_Segment_1.pdf)

Link to segment II:

[http://www.nfpa.org/assets/files/PDF/Research/Engineered Lightweight Truss Roof Construction Bibliography\\_Segment\\_2.pdf](http://www.nfpa.org/assets/files/PDF/Research/Engineered_Lightweight_Truss_Roof_Construction_Bibliography_Segment_2.pdf)

Link to segment III:

[http://www.nfpa.org/assets/files/PDF/Research/Engineered Lightweight Truss Roof Construction Bibliography\\_Segment\\_3.pdf](http://www.nfpa.org/assets/files/PDF/Research/Engineered_Lightweight_Truss_Roof_Construction_Bibliography_Segment_3.pdf)

**Engineered Lightweight Truss Roof Construction - Literature Review and Technical Analysis**, Kirk Grundahl (1992)

This report provides a literature review and technical analysis on engineered lightweight construction that serves as a basis for developing a fire test program on this type of construction.

Link to report:

[http://www.nfpa.org/assets/files/PDF/Research/Engineered Lightweight Truss Roof Construction Bibliography\\_Segment\\_3.pdf](http://www.nfpa.org/assets/files/PDF/Research/Engineered_Lightweight_Truss_Roof_Construction_Bibliography_Segment_3.pdf)

**Currently Active NFPA and FPRF Projects (in chronological order)**

**Developing Friction Loss Coefficients for Modern Fire Hose**, Joseph Scheffey – Hughes Associates, (completion due summer 2011)

This project will develop baseline friction loss coefficients for the types of fire hose commonly used by today's fire service, and identify any additional performance characteristics that should be considered for friction loss calculations.

**Hazard Assessment of Fire Service Training Fires**, Daniel Madzrykowski – NIST, (completion due summer 2011)

This project will address the hazards of live fire training evolutions and provide data and information to support a fire hazard assessment methodology for fire training officers and fire fighters. The projected deliverables will include data and methods required by the fire service training instructors and coordinators to enable fire hazard assessment of the fuel packages used in live fire training buildings, props, and acquired structures to improve the safety of fire fighters.

**Image Quality Testing of Fire Service Thermal Imagers**, Francine Amon – NIST (completion due summer 2011)

This project on thermal imaging cameras will establish Lab-to-Lab repeatability and reproducibility of the four image quality tests in NFPA 1801 (*Standard on Thermal Imagers for the Fire Service*) that address: Spatial Resolution, Non-uniformity, Effective Temperature Range, and Thermal Sensitivity.

**Addressing Community Wildfire Risk: A Review and Assessment of Regulatory and Planning Tools**

Chris Duerksen and Don Elliott, Clarion Associates, (completion due late 2011)

This project will review and assess the effectiveness of regulatory planning tools designed to address community wildfire risk, and to communicate lessons learned to communities considering such regulation.

This will be accomplished by defining the WUI regulatory landscape through the identification of regulatory tools, categorizing these tools, and evaluating them to clarify their effectiveness.

**Analysis of Ambulance Crash Data**, Casey C. Grant and Brian Merrifield – FPRF (completion due late 2011)

This project will identify data sources and data collection information on the safety of EMS crews and their patients, and will recommend optimum data formats and providing summary data if available.

**Assessment of Powered Rescue Tool Capabilities with High-Strength Metal Alloys and Composite Materials**, Casey C. Grant and Brian Merrifield – FPRF (completion due late 2011)

This project will identify and assess current and future extrication scenarios, especially those involving motor vehicles, which use high-strength metal alloys and composite materials (carbon fiber) that are resistant to the performance of the present generation of powered rescue tools.

**Whole Glove Testing Technologies to Advance Performance Standards for Structural Firefighting Gloves**,

Roger Barker and Shawn Deaton – NCSU (completion due in late 2011)

This project will provide new test methods that are intended to revolutionize fire fighter glove testing and standards requirements leading to improvements in the functional performance of gloves available to firefighters.

**Fire Flow Water Consumption in Sprinklered and Unsprinklered Buildings: An Assessment of Community Impacts**, (completion due early 2012)

This report will assess the current prevalence and structure of fire flow fees against the community impact/water usage at sprinklered and unsprinklered properties to develop a consumption-based rationale for community fire fighting resources.

**Emergency Responder Training for Advanced Electric Drive Vehicles**, NFPA, (completion due in 2012)

This project will provide comprehensive awareness and emergency response training to the more than 1.1 million members of the U.S. fire service to prepare them for their role in the safety infrastructure for widespread implementation of advanced electric drive vehicles, including battery electric, hybrid electric, and certain fuel-cell electric vehicles.

**Fireground Injuries: An International Evaluation of Causes and Best Practices**, Jeff Burgess and Mike Duncan – University of Arizona (completion due in late 2012)

This project will evaluate fireground injury rates among selected domestic and international fire departments to identify best practices and optimum SOGs (standard operating guidelines). This study is based on the hypothesis that fireground injury rates will vary by department and country, and that lower injury rates will be associated with more extensive training as well as following high quality standard operating guidelines (SOGs).

**Stair Descent Device Performance for Firefighters**, Glenn Hedman – University of Illinois Chicago, (completion due in early 2013)

This project will provide quantitative data on the demands made on firefighters as they use stair descent devices (SDDs) for physically challenged building occupants, and on device performance over time so that the devices are operational when needed.



## **Emergency Responder Project-Concepts under Construction (in alphabetical order)**

**A Novel Approach to Reducing Firefighter Line-of-Duty Deaths**, with Yale Emergency Medicine

**Capabilities and Limitations of Compressed Air Foam Systems (CAFS) for Structural Firefighting**, with California Polytechnic State University

**Development of a Method to Distinguish Between ‘Cause’ and ‘Victim’ Arc Beads in a Fire Investigation**, with Southwest Research Institute

**Evaluation and Enhancement of PASS Effectiveness**, with University of Texas Austin and NIST

**Field Use Evaluation of Fire Service Personal Protective Equipment**, with NFPA

**Fire and Emergency Services Field Glove Study**, with North Carolina State University

**Foot Scan Study to Create a Standardized Sizing System for Fire Fighters**, with University of Missouri

**Hearing Aid Functionality in the Fire Ground**, with Northwestern University

**Implementation Guides for Emergency Responder Occupational Safety and Health Programs**, with University of Arizona

**Infectious Disease Prevention Program for the Fire Service**, with University of Arizona

**Measuring Effectiveness of Fire Prevention Services**, with NFPA

**Performance Requirements for Compatible and Interoperable Electronic Equipment for Emergency First Responders**, with NIST

**Reducing Firefighter Vehicle-Related Crashes Through Research, Translation, and Dissemination**, with John Hopkins University

**Regulatory and Adoption Assessment of Standardization for Emergency Management and Business Continuity**, with NFPA

Last updated: April 21, 2011