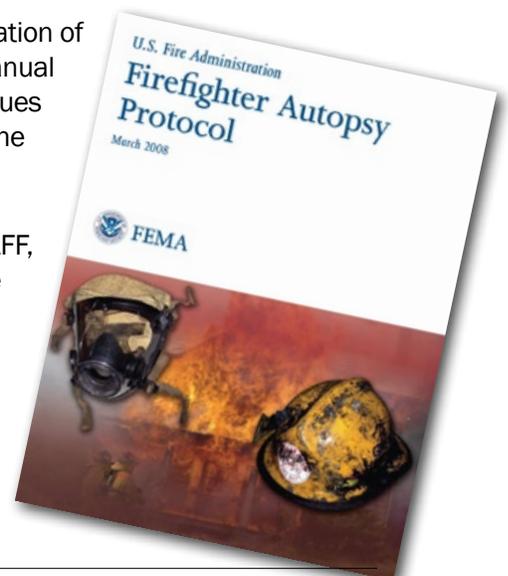


USFA Fire Research Program

As an entity of the Department of Homeland Security (DHS), the mission of the U.S. Fire Administration (USFA) is to reduce life and economic losses due to fire and related emergencies through leadership, advocacy, coordination, and support. To facilitate this, USFA, through its National Fire Data Center (NFDC), fosters research and special studies covering a variety of topics to support firefighter health and safety, as well as fire safety of the American Public, which include

- ▷ **Thermal Imaging Systems Technology**—Along with the National Institute of Standards and Technology (NIST), USFA developed a comprehensive report on thermal imaging camera performance requirements and scientific-based test methods—*Performance Metrics for Fire Fighting Thermal Imaging Cameras—Small- and Full-Scale Experiments* in support of the new National Fire Protection Association (NFPA) 1801, Standard on Thermal Imagers for the Fire Service.
- ▷ **Personal Alert Safety Systems Device Sound Level Assessment**—USFA is continuing its research with NIST on Personal Alert Safety Systems (PASS) devices to determine if the current standard of 95 decibels at a 3-meter distance is sufficient to overcome competing background noise on the fireground for PASS alarms.
- ▷ **Continuation of Research of Technology to Predict Structural Collapse**—USFA continues its work with NIST to develop technology to predict structural collapse on the fireground. The new phase of this research will focus on collapse prediction in lightweight construction and the development of smaller and useable prototype technology.
- ▷ **Self-Contained Breathing Apparatus Thermal Performance Enhancement**—USFA and NIST are initiating research on the enhancement of thermal performance of Self-Contained Breathing Apparatus (SCBA) face pieces to increase the protection of firefighters. To accomplish this, NIST will examine documented on-duty injuries and fatalities of firefighters due to thermal exposure of SCBA face pieces, as well as conduct laboratory thermal testing of commercially available SCBA face pieces as part of this phase of this study.
- ▷ **Virtual Reality Training**—Based on research results from structural ventilation, firefighter protective clothing, and hose stream studies, USFA and NIST are developing a computer-based firefighting training tool that will give firefighters a low-cost way to gain suppression and ventilation experience without exposing themselves and others to danger.
- ▷ **Firefighter Autopsy Protocol Manual**—With the International Association of Fire Fighters (IAFF), USFA revised the Firefighter Autopsy Protocol manual that includes research on the latest medical, technical, and legal issues related to the development of standardized protocols to determine the cause of firefighter on-duty fatalities.
- ▷ **Fire Department Communications**—USFA, in partnership with the IAFF, released the revised Voice Radio Communications Guide for the Fire Service which provides current operational and technological topics related to fire department communications.
- ▷ **Emergency Incident Rehabilitation**—With the IAFF, USFA revised this manual discussing critical health and safety issues related to emergency incident rehabilitation.



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- ▷ **Risk Management**—With the IAFF, USFA completed this project which provides information to fire departments on the design of effective risk management programs based on community hazards and service commitment, enhances firefighter safety, and provides tools for continual evaluation of emergency response systems. Two reports were developed from this study—Contributing Factors to Firefighter Line of Duty Death in the United States and Contributing Factors to Fire Fighter Line-of-Duty Injury in Metropolitan Fire Departments in the United States.
- ▷ **Building Performance Awareness**—In partnership with the American Forest & Paper Association (AF&PA), USFA created a comprehensive interactive Web-based educational program to enhance firefighter awareness of the performance of different forms of lightweight construction components during fires to create a safer operational environment for the fire service. This educational outreach is critical for firefighters operating at incidents to understand how modern building products perform in fires.
- ▷ **Impact of a Residential Sprinkler on the Heat Release Rate of a Christmas Tree Fire**—USFA and NIST developed a report/video demonstrating that, under conditions of extreme fire growth, a single sprinkler was able to prevent flashover, control a tree fire, and limit the spread of fire to other objects.
- ▷ **Fire Escape Technology**—USFA partnered with the U.S. Consumer Product Safety Commission (CPSC), with support of the Naval Research Laboratory, to examine the feasibility of developing a system that uses sight and sound techniques that have the potential to enhance occupant escape capabilities when adverse environmental conditions are caused by fire.
- ▷ **Water Supply Systems Concepts and Water Supply System Evaluation Methods**—With the Society of Fire Protection Engineers (SFPE), USFA examined the latest trends and technologies related to municipal water supply systems in relation to enhancing local-level fire protection.
- ▷ **Fire Safety Partnerships with the National Fire Protection Association**—Supported by USFA, NFPA research behavioral issues aimed to reduce fires caused by cooking and smoking, as well as examining what can be done to reduce the high death rate from fire in rural America. Three reports were produced from this research:
- *Behavioral Mitigation of Cooking Fires;*
 - *Behavioral Mitigation of Smoking Fires;* and
 - *Mitigation of the Rural Fire Problem in the United States.*



Further information on the research and applied technology projects and partnerships discussed above may be found on the following USFA Web site: <http://www.usfa.dhs.gov/fireservice/research/index.shtm>



FEMA



U.S. Fire Administration