

TESTIMONY

for the

Subcommittee on Technology and Innovation

of the

Committee on Science and Technology

U.S. House of Representatives

on

**“The United States Fire Administration Reauthorization:
Addressing the Priorities of the Nation's Fire Service”**

by

**Dr. John R. Hall, Jr.
Assistant Vice President
Fire Analysis & Research
National Fire Protection Association**

October 2, 2007

Good morning. I am Dr. John Hall, Assistant Vice President for Fire Analysis and Research at the National Fire Protection Association (NFPA). Mr. Chairman, fellow Subcommittee members, NFPA and I greatly appreciate the opportunity to speak to you today in support of the reauthorization of the U.S. Fire Administration (USFA).

Before I address the main questions in this hearing, I would like to look at the record of the USFA over its more than three decades. Year in and year out, the USFA demonstrates high professional skill, strategic vision, the ability to set priorities, and a sustained dedication to its unique dual role of the leader of Federal government fire safety and fire service programs and leader/supporter of America's fire and emergency services, in all the great work they do. NFPA looks forward to continuing our long and productive partnership with the USFA and in particular to working closely with the newest U.S. Fire Administrator, Chief Gregory Cade.

1. NFPA's Current Priorities for and Perspective on USFA and Fire Technology Related Research and Development

NFPA is America's principal private non-profit fire safety advocacy organization. As such, our interests in research and development are driven by the needs of programs that will maintain or improve safety from unwanted fire and other hazards and that will help America's first responders to safely and effectively perform their roles of protecting the rest of us.

Fire safety programs may operate principally through innovative technology, supported by consensus codes and standards, or through behavior change, achieved by education of ordinary people and training of professionals.

In terms of technologies for greater fire safety, NFPA is a strong advocate of the proven value and future potential of smoke alarms and fire sprinklers, as well as design changes to powered equipment and other heat sources, changes in the fire performance of materials and products, and changes in the knowledge and behaviors of people.

In its first decade, the USFA provided strong leadership in funding, defining and applying research to create a form of fire sprinkler protection that made engineering and economic sense for individual housing units. More recently, the USFA has continued to look for additional innovations and approaches that will bring this life-saving technology to more homes.

In the early years of America's interest in smoke alarms, the USFA provided leadership in measuring the beliefs and values of American heads of households, and in so doing, helped to accelerate the process of placing smoke alarms in nearly every home. More recently, the USFA and many other agencies and

organizations have focused on taking smoke alarms to the millions of mostly high-risk homes that still do not have this protection.

The USFA has also funded research by NFPA to help identify innovative solutions to

- smoker behaviors that influence cigarette fires, still the #1 cause of *fire deaths* in the U.S.;
- cooking equipment and cooking behaviors, still the #1 cause of *home fires and related injuries* in the U.S.;
- and the variety of circumstances that make the fire problem of rural America distinctive, where rural communities still have the highest fire death rates relative to population in the U.S.

On the fire service research side, the USFA has worked closely with the National Institute for Standards and Technology (NIST) to support advanced computer analysis of fires where firefighters are fatally injured. These studies have led to sophisticated new simulation and training tools, as well as an understanding of rare but unusually dangerous fire phenomena and changes in firefighting tactics and procedures.

The USFA has also partnered on research on most of the technologies that firefighters and other first responders use to do their job safely and effectively, such as:

- portable radios, where interoperability continues to handicap firefighting in the largest incidents;
- personal alert safety systems, where questions have arisen recently about equipment performance in severe fire conditions;
- self-contained breathing apparatus and personal protective clothing, where protection from the many threats associated with fire must be balanced with the needs of the body to take in oxygen and get rid of heat.

These are only examples of technologies that deserve high priority because they offer especially great promise of significant improvement in fire prevention, fire mitigation, firefighting effectiveness, or firefighter health and safety. In every instance, the USFA has shown leadership in setting priorities, putting high-quality projects in motion, and partnering with many agencies and organizations to accomplish shared goals.

Your draft reauthorization bill addresses the subjects of applied research and technology in what I believe is the most appropriate manner for an agency with a proven track record of good judgment and important results. You have reinforced the range of technologies, including detection, prevention, suppression, and department operations, that are appropriate to the USFA mission, but you have resisted the temptation to substitute the judgment of Congress for the judgment of the USFA professionals in allocating resources among these technologies. You have underscored the importance of

coordination and partnership with other national entities and listed many of the Federal agencies best equipped to serve as partners.

But you have resisted the temptation to steer the USFA toward any particular agency or to favor governmental partners over private partners. You have shown an awareness of the major elements of the problem and its solutions, while also showing your trust and confidence in the USFA professionals to make the best choices.

2. Please describe NFPA's role in setting standards and codes for firefighting technology. How does NFPA engage with USFA and NIST in the standards setting process? Does the current statute make adequate provisions for this process?

NFPA is America's principal source for national voluntary consensus codes and standards related to fire safety and the fire service. Our standards and codes address such topics as:

- professional qualifications for fire fighters, fire officers, fire inspectors, fire and life safety educators, and many other specialized positions and assignments within the fire service;
- performance, testing, maintenance, and operation standards for firefighter protective clothing and equipment and for firefighting apparatus and equipment; and
- requirements for programs, such as training, disaster/emergency management, business continuity, and fire service occupational safety and health maintenance.

The NFPA codes and standards development process uses a "true consensus" approach, in which technical committees are composed of a balance of interests, with no one interest having a majority of votes. For fire service related standards, we have extensive representation from organizations representing fire chiefs, fire marshals, fire investigators, firefighters, fire and life safety educators, and city and community managers. We value all our volunteers, including the over 400 staff from the USFA, NIST and other Federal agencies who participate in the NFPA process. Many of our standards have been greatly improved due to the special expertise brought to the committees by USFA and NIST staff.

Once NFPA standards are issued, they still need to be adopted and enforced. Adoption decisions are made separately by individual states and municipalities. Some Federal agencies also adopt NFPA codes and standards for applications under their jurisdiction.

The USFA cannot act directly to achieve adoption of standards by other Federal agencies, let alone by non-Federal entities, but the USFA can improve the climate in which decisions about adoption are made by forcefully and visibly supporting the voluntary consensus codes and standards process and by putting

the considerable weight of its own reputation and leadership in support of compliance with national fire service standards. The same can be said of NIST in those areas where its expertise is universally acknowledged.

NFPA agrees with the draft legislation that “development and enhancement of national voluntary consensus standards” is an important part of the USFA mission. NFPA welcomes this recognition of the importance of such standards in translating the latest scientific research into practice.

3. Please discuss NFPA’s work in fire prevention and firefighting technology research. How does NFPA engage with USFA and NIST in research activities? What funding opportunities exist for extra-mural fire research, and are they adequate? Are there areas of particular importance that are currently neglected due to lack of resources?

NFPA plays a fairly limited direct role in fire prevention and firefighting technology research. Most hands-on research done by NFPA staff is conducted within my division, and we concentrate primarily on statistical analysis and literature reviews, plus related research in areas such as human behavior and fire risk assessment. In that capacity, NFPA has conducted funded research projects for the USFA and NIST from the beginning.

The Fire Protection Research Foundation is an independent entity at NFPA that brings together funders and researchers on projects to answer questions affecting NFPA codes, standards, and other programs and activities aimed at increasing program effectiveness or cost-effectiveness in areas of fire safety or firefighter health and safety. NIST has provided lead researchers for Research Foundation projects and the USFA has provided funding for Research Foundation projects, including current projects on firefighter respiratory exposure and fire code inspection and compliance programs.

Both the USFA and NIST do an excellent job of sorting through potential projects and supporting the ones with greatest potential. But research funding for fire safety science and engineering and for firefighter effectiveness, safety and health has been shrinking for many years, not only in the U.S. but around the world. This is true for governmental research, university research, and private-sector research.

There are many technical controversies surrounding home smoke alarms, fire sprinklers, sensors for detection of incipient fire conditions involving different types of equipment, non-traditional detection and suppression systems, innovative high-performance materials, implications of energy conservation programs, implications for fire safety of differing international approaches to toxicity and environmental protection, and the list goes on. In every instance, the developers of codes and standards have to make decisions based in part on best judgments when definitive technical answers might be no more than one well-

designed project away. In every instance, the leaders in fire safety and firefighter health and safety have to establish requirements based on the known capabilities of existing technology because promising new technologies lack the kind of independent testing and evaluation that would allow them to be widely adopted if they prove out and avoided if they do not.

This nation is nowhere near the point where additional research dollars stop paying for themselves. More funds will yield results and will improve people's lives. The USFA professionals have shown their ability to use the funds available to them effectively and wisely.

4. Please provide an overview of the findings in the 2006 FEMA/NFPA study, “*Four Years Later – A Second Needs Assessment of the U.S. Fire Service.*” How can Congress use the results of this study to strengthen the pending reauthorization legislation?

I personally led the NFPA analysis team that conducted both fire service needs assessments. NFPA President Jim Shannon described the first needs assessment as a “call to action.” The needs for essential resources were widespread, covering every role the fire service plays and every type of resource, from personnel to training to equipment to planning.

Because the first needs assessment took place around the 9/11 attacks on America, particular attention was given to the findings on preparedness for dealing with unusually challenging events, including two types of terrorist attacks we had included in the survey. We conducted a cost analysis on our findings as input to the study of terrorism preparedness by the Council on Foreign Relations, and we found that meeting those needs alone would require tens of billions of dollars.

A separate cost analysis of needs for career firefighters identified additional tens of billions of dollars of unmet needs to meet standards and guidelines related to firefighter staffing and coverage. That analysis was provided as support for the so-called SAFER bill.

Our second needs assessment included a matching analysis of Assistance to Firefighter grants against the reported needs of the departments that had received those grants. We found a very high match rate, indicating that fire departments were requesting resources that they really needed, in order to safely and effectively perform the tasks their communities were asking them to perform.

We also found some improvement on some of the measures of aggregate national need. For example:

- the percentage of departments that had enough portable radios to equip everyone on a shift rose from 23% to 36%;

- the percentage of departments with enough self-contained breathing apparatus to equip all emergency responders rose from 30% to 40%;
- the percentage of departments with enough personal alert safety system (PASS) devices to equip all emergency responders on a shift rose from 38% to 52%; and
- the percentage of departments with written agreements to coordinate the use of outside personnel and equipment in a response rose from 19% to 26% for a reference building collapse scenario, from 21% to 30% for a reference biological/chemical agent scenario, and from 33% to 40% for a reference wildland/urban interface fire scenario.

Some were surprised that the improvements were not more dramatic and did not extend to more types of resources. (For example, staffing and training measures of need showed no dramatic improvements.) We were not surprised because we knew that a program funded at about a half-billion dollars a year could not expect to rapidly transform a set of fire service needs estimated collectively to cost many tens of billions of dollars.

We suggest that Congress use our needs assessments as tools for priority-setting. Priorities can be set by type of program or resource, where unfunded Federal mandates and responsibilities that inherently cross jurisdictional lines would receive first priority, and priorities can be set by some measure of vulnerability, where larger communities more central to the national economy or more exposed in terms of iconic structures might receive first priority. But the key word here is “priority.” All of the needs identified are real needs, and our safety will suffer – and the safety of our first responders will suffer – for as long as we continue with these needs unmet. But we have to start somewhere, and it makes good sense to look for additional ways to apply funds first where they will have the greatest impact.

That having been said, it is impossible to read the needs assessments without concluding that the grant program needs to be increased in size, from a fraction of a billion dollars annually to some multiple of a billion dollars annually. With their strong track record of distributing grant funds for best effect in the early years of the program and with additional guidance of another look at priority-setting rules for even greater effect, the USFA professionals can be counted on to deliver high value as well as greater safety and effectiveness to America in any expanded program.

5. NFIRS.

The National Fire Incident Reporting System (NFIRS) is not the subject of one of the questions issued by the Subcommittee, but it is the subject of considerable detailed attention in the draft legislation. Because NFIRS is the one database that is most important to make my work at NFPA effective, I would be remiss if I did not offer some observations on the proposed plans for NFIRS.

First, let me underscore how important NFIRS has been in defining our national fire problem in the three decades since its inception. Through its annual stratified random-sample survey of U.S. fire departments, NFPA has been able to define the overall size and trends of the fire problem, but we had not been able to say much about the details until the advent of NFIRS. Since then, NFIRS has been central to the design of every fire prevention program and debate in the U.S., helping to support or knock down claims of urgency for a particular fire problem or of effectiveness or promise for a particular solution.

Despite its great value, NFIRS has been subject to criticism from the beginning. Some of the criticism has been directed at the level of detail. This has always been a balancing act between the reporting burden on firefighters and the amount of detail sought by decision-makers. Neither side has ever been fully satisfied with the place where that balance has been struck, and both sides have often been vocal about their dissatisfactions. All too often, they have greatly overstated the sizes of problems and undercut the support for the NFIRS system itself. By trying to make it better, as they defined better, they risked making it go away.

This year, the focus is on NFIRS timeliness and on the promise of web-based reporting. I believe web-based reporting, properly integrated with the existing NFIRS system, can be a valuable enhancement, but it is important to recognize what such reporting can and cannot do.

Web-based reporting makes it easier to report fires. That is both its advantage and its disadvantage. NFIRS quality depends on editing at the local, state and national levels. Many missing entries, conflicts and errors are caught during these edits so that the final database is more accurate. Direct web-based reporting in real time may discourage or eliminate some or all of this editing or discourage the addition or revision of details based on late-emerging information, such as delayed deaths, full fire investigations, and insurance assessments.

Whatever the effect of changes in reporting, the analysis of NFIRS cannot be done validly in real time. NFIRS is a sample of fires reported to fire departments. It is not a census or anything close to a census. The fact that NFIRS is a sample means that its validity depends on its representativeness. NFIRS is a large enough sample that issues of representation by region or size of community can usually be ignored, although recent declines in participation of the largest cities have severely affected our ability to track and project trends in high-rise building fires.

Analysis of NFIRS data based on what has been reported to date in a given year means a much smaller sample and reduced representativeness, reflecting the fact that different sizes of communities and different regions are likely to differ in their speed of reporting and in their participation in the web-based reporting. To

get valid estimates from NFIRS, you need to wait until a sufficient and representative group of participants have fully reported.

Since 1980, most of my work has been centered around NFIRS analyses, and I have had the privilege of being involved in nearly every major national policy debate on fire safety and fire service effectiveness and safety in that period. In all that time, I have rarely seen a debate that even benefited from, let alone required, very current data. Management makes decisions when it needs to with the benefit of the information available at that time. Some information may not be completely current; some information may lack useful details. A real-time NFIRS would inject more current data with serious questions of quality and accuracy. That is not a prescription for improved decision-making.

In those rare instances where we really could use current data, we usually need more detailed data than NFIRS can provide. This means we need a special data collection protocol, which we would need for the detail anyway and so might as well use to achieve the greater timeliness. But in so doing, we need to be constantly aware that most policy discussions are far better served by large quantities of valid data than by the latest anecdotal-quality data.

What this means for the current draft legislation is that I urge the subcommittee to maintain the kind of broad and flexible guidance it has used in the rest of the legislation when it talks about NFIRS. By all means, add funds to support expanding the existing web-based reporting if you wish to do so, but leave the USFA professionals with the flexibility they need to fill in the details.

Quite frankly, if I had additional funding to use on NFIRS, I would give higher priority to reinstating funding for the National Fire Information Council, an information-exchange and training network of states and major metropolitan areas participating in NFIRS. That action would provide much broader and deeper returns in terms of NFIRS quality and consistency than will expanded web-based reporting.

Closing Thoughts

The USFA needs and deserves your support. The USFA needs to know that Congress believes in their mission and wants them to succeed. The USFA needs to know what you expect but not detailed requirements on how those expectations should be met. The USFA needs to hear that Congress encourages their leadership and their partnerships, but they need to know that Congress realizes that the USFA is already doing a great job on this score. Most of all, the USFA needs to hear that you recognize what it costs to do what you want the agency to do and that you will seek to align the agency's budget with its mandates.

I think I speak not only for NFPA but for all the fire safety community in saying that we need a strong USFA on our team. We need a USFA that does the things it does better than anyone else and that makes it easy for everyone else to do what they do best.

For all those reasons, the NFPA strongly and enthusiastically supports the reauthorization of the U.S. Fire Administration.

John R. Hall, Jr.

Assistant Vice President -- Fire Analysis & Research
National Fire Protection Association
1 Batterymarch Park, Quincy, MA 02169-7471

Education

B.A. (Mathematics), Brown University, Providence, RI,
Cum Laude, 1967

Ph.D. (Operations Research), University of Pennsylvania,
Philadelphia, PA, 1972

Experience

1984 -

National Fire Protection Association, Quincy, MA
Assistant Vice President (formerly Director)
Fire Analysis and Research Division

The Division is responsible for measuring the fire problem and communicating the results as a basis for fire safety decision-making and priority-setting. In research, the Division supports the Association initiative toward performance-based codes and standards, and conducts research in such areas as evacuation modeling and fire risk analysis.

1982 - 1984

Center for Fire Research, National Bureau of Standards,
Gaithersburg, MD
Operations Research Analyst.

Led development of a modeling framework for fire risk analysis. Worked on risk analyses of home sprinklers, fire-blocking of seats on passenger airlines and nuclear facilities.

1979 - 1982

Federal Emergency Management Agency, U. S. Fire Administration, Washington, DC
Operations Research Analyst.

1973 - 1979

Urban Institute, Washington, DC
Senior Research Associate (previously Research Associate).

1972 - 1973

Resource Management Corporation, Bethesda, MD
Research Analyst.

Financial Disclosure Form

Instructions: Please complete this form to the best of your ability. Return the completed form to the Committee on Science and Technology at least 24 hours prior to the hearing at which you will testify.

You need only disclose financial interests which are relevant to the subject matter of your testimony or the subject matter of the hearing at which you will testify. Please list all appropriate interests for the past two (2) years. If you need additional space, please continue your responses on a separate sheet of paper.

Government research grants or contracts: Participant in five research projects sponsored directly or indirectly by the US Fire Administration – smoker behaviors related to fire, fire problems of rural communities, cooking fire problem and ways to reduce it, needs assessment of the U.S. fire service, fire code inspection effectiveness and code compliance (as subcontractor to Fire Protection Research Foundation, the primary grantee).

Non-government research grants or contracts: None during this period.

Government employment or other compensation: None

Non-government employment or other compensation: Employed by National Fire Protection Association, a private non-profit association.

Stock or stock options in public or privately held companies: My wife holds stock in Arvin Meritor, Boeing, Mindspeed, Rockwell Collins, Rockwell Automation, Skyworks Solutions. She and I hold stock mutual funds from Vanguard (three broadly based index funds), and I have shares of Fidelity's Contra mutual fund.

Other: None