

**National Residential Sprinkler Initiative
Phase III--Allied Professionals
April 19, 2005**

Purpose

- To explain the National Residential Fire Sprinkler Initiative, to date.
- Identify barriers, real or perceived, to the increased acceptance of residential sprinklers from the points-of-view of allied professionals.
- Promote the value of residential sprinklers among allied professionals.
- Identify areas where fire protection and allied professionals can work together to promote residential sprinklers.

Participants: Allied Professionals

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Welcome: Administrator R. David Paulison

Mr. Paulison addressed the group at the beginning of the meeting. During his 30 years in the fire service, he has observed that sprinklers really work and make a significant difference. Being that most of our fire deaths are in the home, he stressed the need to continue the pursuit of getting sprinklers installed in residences. Communities with residential sprinkler ordinances have had fire deaths drop if not disappear. He thanked the group members for their participation and expressed his appreciation for their hard work on the initiative.

Introductions

The group introduced themselves and explained their affiliations.

Overview of the Initiative Strategies

Larry Maruskin introduced the facilitator, Dr. Jim Milke, from the University of Maryland. Larry gave an overview of the history of this initiative, which dates back to the first meeting in 2003 when the administrator encouraged the USFA to revitalize the sprinkler initiative. He explained how this was the third meeting/phase of this initiative. The following four National strategies were developed during the first meeting:

- Develop aggressive strategy for advocating residential sprinkler systems in occupancies the Federal government influences or supports financially, especially manufactured housing or health care facilities.
- Based on research, data and proof of concept, advocate localized fire suppression in high fire risk areas (e.g., kitchens) for retrofit applications.
- Provide advocacy and informational support among partners, State and local decision makers, finding a common agenda on behalf of the protected public.
- US Fire Administrator continue to support research and development and associated programs aimed at advances in residential fire sprinkler technology for the increased acceptance of residential fire sprinkler systems.

This third phase of meetings relates to the third strategy noted above. The report from the first two meetings can be found at:

<http://www.usfa.fema.gov/downloads/pdf/nrfsi-03report.pdf>
<http://www.usfa.fema.gov/downloads/pdf/nrfsi-04report.pdf>

NIST Research on Residential Sprinklers: Dan Madrzykowski

Mr. Madrzykowski provided an overview of recent fire sprinkler research initiatives at NIST. The initiatives included:

- assessing residential sprinkler design criteria relative to the design density or flow required from sprinklers in the operating area;
- localized residential fire suppression for kitchens;
- cost effectiveness analysis of residential sprinkler systems;
- cost/benefit analysis.

Current challenges to implementing the use of sprinklers include:

- issues involving water authorities, including smaller (5/8") water meters and tap fees. Tap fees increase the cost of residential sprinklers, negating cost incentives obtained elsewhere;
- water supply limits of pressure or flow; including (but not limited to) residences with domestic water supplied by private wells;
- concerns over "increased " water supply requirements associated with the recently adopted "double 0.05" density requirement;
- only a limited number of residential sprinklers have been "re-listed" with the adoption of the double 0.05 gpm/ft² density requirement.

Given that most residential fires controlled by residential sprinklers involve the operation of only one sprinkler, recently attention has been given to examining the concept of a single sprinkler design. NIST has examined the use of a single sprinkler with a 40% increase in the density to 0.07 gpm/ft². Because the flow from only one sprinkler would need to be considered in the design, this would result in a reduction in the water supply requirement for residential sprinklers. The experimental program and data is available in a NIST report, NIST GCR 05-875. The test results were provided to the NFPA 13D committee for consideration. This proposal was rejected by the committee, having the opinion that a design with a single operating sprinkler was outside the scope of NFPA 13D. Subsequent committee actions on this topic will depend on public comment on the committee's rejection of the proposal. Also, NIST will be providing additional activation data and final project reports to the committee before possibly resubmitting the proposal.

Experiments with a localized sprinkler system were conducted in kitchen mock-ups. One experimental program was conducted in a laboratory at NIST, while another experimental program was conducted in an apartment in Prince Georges County, MD. The design consisted of a single sprinkler, located at half of the spacing from the stove. The water supply characteristics for the sprinkler could be confirmed via an elementary flow test at the kitchen sink. Sprinklers controlled all fires in the experimental program. This design concept was submitted as a proposed change for NFPA 13D. The technical committee rejected the proposal on the grounds that the scope of the standard is for a system (not a local system). However, the proposal will be published as a proposal and be available for public comment.

Cost-effectiveness of residential sprinklers is being examined using life-cycle costs of residential sprinklers. Both stand-alone systems and multi-purpose systems are included in the analysis. Three types of houses are being considered: townhouse, ranch house and two-story home with a foyer.

A constant pressure pump has been identified as a new option for water supply for residential sprinklers. This type of pump would operate off a well system and improve the domestic water supply as well.

More complete information and updates on residential sprinkler research can be found at www.fire.nist.gov and www.usfa.fema.gov:

Allied Professionals Discussion on Residential Sprinklers

Each of the meeting attendees were asked for their comments on possible program and initiatives by their organizations to disseminate information on the importance of implementing residential sprinklers.

Jane King, American Association of Retired Persons (AARP)

Public education was identified as AARP's potential principal contribution. They issue a bulletin once a month, the AARP Magazine 5 times a year, a website and have a broadcast studio that produces video news releases.

Ms. King's group, "Outreach and Service", does a lot of work at the community level. They have an office in every State and are in the community frequently. AARP is also developing volunteer corps to work on issues in the communities. Currently, they are testing certain kinds of activities, including one related to affordable assisted living. A project was built in Las Vegas with the collaboration of other organizations. In El Paso, TX, Hartford, CT, Charlotte County, FL, and St. Louis, MO, they are working with 40 organizations on a "Livable Facility" project.

In the past they have publicized the importance of residential smoke alarms.

Eric Goldberg, American Insurance Association (AIA)

The insurance industry has an inherent interest in preventing fires and in systems which limit damage. However, the industry recognizes that implementing safety features in homes requires changing the culture where homeowners often opt for upgrades rather than a residential sprinkler system.

The AIA is a strong advocate of statewide building codes. They represent over 400 insurance carriers. Some of the carriers offer premium reductions for having a sprinklered home. Because the portion of the insurance premium that is

attributable to fire is small, the reduction for sprinklers cannot be large, but nevertheless would still be a reduction. However, the incidence of fire claims is among the largest of those that are paid out.

A major contemporary issue in the insurance industry is related to mold in homes. If sprinkler systems malfunction, mold or water damage may result and be more extensive than fire damage.

Public education is available through the AIA newsletter. The newsletter recently included an article promoting residential sprinklers.

Jeff Inks, National Association of Home Builders (NAHB)

The current NAHB policy does not support code mandates for the installation of residential sprinkler systems. NAHB is concerned with the affordability of housing and opposes additional features which have not yet been demonstrated to be cost effective.

NAHB has been searching for data on fire losses in homes with residential sprinklers which they can compare with fire loss data from similar homes, but has not yet uncovered data that indicates the cost advantage provided by sprinklers. NAHB would objectively review any new data or information presented on the issue of the cost effectiveness of residential sprinklers.

NAHB has developed a cost estimate for installed residential sprinklers in new homes of \$1.20 per square foot, which is cheaper than the estimate provided by the American Fire Sprinkler Association. NAHB is in favor of additional research being conducted which would result in cost reductions for residential sprinkler systems, such as localized systems. In the 1990's, the USFA worked with NAHB Research on a project that promoted residential sprinklers.

Other concerns raised include multi-purpose systems, design density, reliability, maintenance requirements, water supply (especially in cases where public water is not available) and recall programs. NAHB is willing to cooperate on developing cost effective solutions for water supply arrangements. For the recent recall programs, it's unclear whether every sprinkler included in the recall has been replaced. For a life safety device, NAHB indicated that the fire protection industry should have a method to make sure every recalled device is replaced.

A significant market exists for the retrofit of existing homes. The investment in renovation and improvement of existing homes is appreciably larger than that for new construction. The availability of guidance on installation and maintenance issues needs to be better marketed. A residential sprinkler system has been provided in a demonstration home.

NAHB has significant educational activities that are provided for their membership, i.e. home builders. Part of the thrust of the education activities is to dispel bad information such as the myth of all sprinklers operating if the system is activated. Other information provided is to indicate the safety provided by sprinklers. The education is conducted at the "Builder Show" as well as regional NAHB meetings. While much of the program for the 2006 Builder Show is already established, a slot may be able to be opened for a session on residential sprinklers. Alternatively, sessions at future events could be possible.

NAHB has not received any complaints since the sprinkler ordinance in Montgomery County, MD was implemented. A continued successful experience will depend on the builders and the ability of the county to provide timely inspections.

Carol Newell, American Institute of Architects (AIA)

The AIA does not have a general policy on residential sprinklers. AIA has a significant educational program for their members. Their newsletter, "Outreach" could include information on residential sprinklers. Some of the activities offered by AIA are provided as a result of a significant volunteer effort. One such activity is the "Communities by Design" which examines long-range, strategic approach to bringing issues to the attention of their membership.

Many of the educational programs provided by AIA are done regionally through their chapters. Some of these programs were developed for the national conference and are distributed to chapters. Any group or individual can submit a proposal for their convention. AIA recently offered a course on mold conditions. A course on residential sprinklers could be developed and made available.

Mike Love, Montgomery County Fire and Rescue Department

Development of the residential sprinkler legislation in Montgomery County, MD required several years. They examined Prince Georges County's (MD) approach at developing the legislations. The Montgomery County Fire and Rescue Department developed their proposal through a forum, and worked to obtain the support of the County Council. The legislation was adopted in October, 2003 after three previous unsuccessful attempts. Part of their success was attributed to being able to build on existing legislation in Rockville and Gaithersburg, MD (two communities within the county). The mandate for requiring sprinklers became effective as of July, 2004.

Since the legislation has been adopted, the County as been working aggressively to assemble the necessary staff and resources to enforce the legislation. This was accomplished by establishing a new fee structure as of June, 2004. One significant accomplishment was the establishment of a relationship with the homebuilders association. Some of the early efforts included getting everybody

together on a biweekly basis to discuss issues related to inspections, including inspection procedures and timeliness. The County guaranteed a 2- to 3-day turnaround on inspections and provided training to the builders.

The County developed a video and CD on the installation process. Research still needs to continue on things such as variable pumps to address water supply issues where the public water is unavailable or inadequate to supply a residential sprinkler system.

As part of the legislative package which mandated residential sprinklers, a homeowner's manual on residential sprinklers was required to be provided to consumers. This manual was developed by the County and includes information on sprinklers.

The County is pursuing developing a file to compare sprinkler success stories with those fire incidents where residential sprinkler systems are not installed. This information will assist the County's future educational mission.

Gary Keith, Home Fire Sprinkler Coalition (HFSC)

The Coalition was created in 1996 when it was suggested that the National Fire Protection Association (NFPA) provide residential sprinkler education. The coalition members include NFPA (project manager), the National Fire Sprinkler Association, and the American Fire Sprinkler Association. The main focus of the education program developed by the Coalition is new construction of one- and two-family homes. Their Web site (www.homefiresprinkler.org) is now the primary tool to reach out to consumers.

The Coalition has received two grants from FEMA. Products from the Coalition include a builder education kit, "Built for Life." The kit contains a CD for both builders and consumers. The next aspect of their grant includes another education piece on "Living with Sprinklers." Markets for the kits include: Atlanta, Orlando, Phoenix, Dallas, Las Vegas, Chicago, Portland, Oregon, Hartford, and Knoxville. The Coalition is working with a builder in each of these areas, providing a system, and doing education. The kits also are available to any fire department upon request.

As an entity, the Coalition's main focus is education. The spokesperson for the educational programs is Ron Hazelton. Ron filmed a sprinkler system retrofit of his home for another video. A video included in "Built for Life" depicts a walk through of a standard sprinkler installation and the benefits of sprinkler systems.

The principal audience for the Coalition's materials includes the fire service, construction trades and consumer groups. While the Coalition does not lobby at hearings concerning proposed legislation to mandate residential sprinklers, the material developed by the Coalition is often introduced at the hearings.

Open Discussion/Summary

An article from the *Sprinkler Age* Magazine entitled “Home Fire Sprinkler Systems Cost Homeowners Pennies a Day in California” (see Appendix) on the affordability of home fire sprinklers was discussed relative to the issue of cost which was raised several times throughout the meeting.

The final discussion involved what future efforts can be pursued with the intent of increasing the acceptance of residential sprinklers.

- Educational materials
 - All groups present at the meeting have education programs. Each of the groups is either already providing programs on residential sprinklers or is willing to do so.
 - Media is beginning to cover the issue of lack of sprinklers in dwellings. The media needs to address the issue of sprinklers that perform properly in residential dwellings.
- Acceptance of residential sprinklers
 - The acceptance of residential sprinklers needs to be consumer driven in order to accomplish a change. As such, consumer education remains an important mission.
 - Builders should not be expected to be the driving force on this issue.
- Costs
 - Reducing the costs of sprinkler systems is important. Multipurpose systems are an option.
 - Demonstrating the cost-effectiveness of residential sprinklers would be very useful.
 - The Scottsdale reports may lend some information on the performance of residential sprinklers, documenting their experience over the last 10 and 15 years since implementing their sprinkler ordinance. This data has been used to indicate the benefits of residential sprinklers. The reports can be found on the Home Fire Sprinkler Coalition (HFSC) Web site (www.homefiresprinkler.org).
 - More recognized design options for the developer/builder should be permitted if residential sprinklers are installed, e.g. closer spacing of homes and increased separation of fire hydrants, etc.
 - Localized fire protection in retrofit applications should be considered.
- Builders' Concerns
 - Administrative issues for jurisdictions mandating residential sprinklers: scheduling and requirements need to be addressed.
 - The following question needs to be addressed: Who holds liability for inadequate performance of a residential sprinkler system or the generation of mold from a discharge (whether associated with a fire or not)?
 - Who should install the systems: licensed plumbers or specially certified contractors?

- An opportunity to provide dialogue on sincere concerns by all stakeholders is needed.

A meeting of a larger group of allied professionals may be held in the future.

Appendix

Article: Home Fire Sprinkler Systems Cost Homeowners Pennies a Day in California

The president of Advanced Automatic Sprinkler Company in Hayward, California has developed a presentation that helps demonstrate the affordability of owning a residential fire sprinkler system.

When Brentwood city council members were considering a residential fire sprinkler ordinance, Fred Benn's presentation came in handy. "The council had created a task force to determine the costs involved with requiring a residential sprinkler ordinance," stated Benn. "When the task force presented its conclusion that sprinklers were too expensive, we were ready with a slide presentation and handouts."

Benn first broke down the mortgage information for a \$400,000 home, the average price for a 3,000 square foot home in his area. The cost to install the system was estimated to be \$3,000. Using a 7.75% interest rate on a 30-year mortgage, Benn calculated the \$3,000 sprinkler system cost would increase the monthly mortgage by \$20.47.

Next, Benn figured the tax and insurance savings for installing a residential system. With 28% federal income tax and 5% California state income tax, a tax credit of \$6.10 per month resulted from the deduction of the interest portion of the additional \$20.47. Benn contacted insurance companies to gather the premium discount provided to homeowners with residential sprinkler systems. Six insurance companies gave quotes. The premium reduction for having a residential fire sprinkler system ranged from \$90 to \$165 per year. Using the middle quote of \$136 per year, Benn calculated the savings to be \$11.33 per month.

Adding all the credits together gives a total of \$17.43 per month. Subtracting that from the monthly mortgage increase of \$20.47 leaves an increase of only \$3.04 per month for the protection of a residential fire sprinkler system.

"Basically, for the price of a Happy Meal or a Starbuck's coffee, your family can be protected by a residential sprinkler system," Benn commented. His efforts paid off when the Brentwood City Council passed a residential ordinance that same day.

Editor's Note: Sprinkler installation costs vary. On average, HFSC estimates the cost of sprinklers in new construction to be between 1 and 1.5% of the total cost of construction. Installation costs are lower where demand is greater. For example, in Scottsdale, AZ, where fire sprinklers are required in new homes, the cost to install residential sprinklers is less than \$0.80 per square foot.

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