The Voice of the Fire Sprinkler Industry

200 WEST COLLEGE AVENUE, SUITE 209 • TALLAHASSEE, FLORIDA 32301 • (850) 222-2070 • FAX (850) 422-1752
E-MAIL: DEWAR@NFSA.ORG • WEBSITE: HTTP://WWW.NFSA.ORG

April 7, 2014

Brian Gale, Chair
Board of Building Regulations and Standards
Commonwealth of Massachusetts
One Ashburton Place, Room 1301
Boston, MA 02108

Re: Response to Draft White Paper on "The Cost Effectiveness for Health, Safety, and Security of Fire Alarm Systems and Fire Sprinkler Systems in 3 to 6 Unit Residential Buildings."

Dear Chairman Gale,

David LaFond, our New England Manager has expressed concern over the Draft White Paper. Thus the National Fire Sprinkler Association wishes to share our concerns and provide comment with the draft White Paper cited above. The non-profit NFSA is a stakeholder and its members are impacted by the recommendations espoused in this draft paper. Please understand that the homebuilding industry and the realtors are too stakeholders in this dispute and therefore it is critically important that both sides of the issue are clearly understood. We will be preparing a detailed response to this draft White Paper that provides clarity and substantiation for the existing fire safety requirements in the national model codes but wish the BBRS to consider another path towards addressing the builders economic concern.

There are three substantive issues that must be considered. First and foremost, what is the fire safety problem the fire alarm and fire sprinkler code requirements are in place to mitigate? Secondly, what technically supported alternative solutions must be put in place to offset any changes to the codes - to simply remove one requirement without addressing alternatives is not in the best interest of the health, safety and welfare of the public? And thirdly, what are the TRUE economic implications of failure to apply the national model codes?

1. The Fire Safety Problem. Fire alarm and fire sprinkler requirements are in the national model codes because of significant fire safety concerns in new constructed homes for the occupants and the responding firefighters. Our nation's fire safety problem is getting worst, not better. As reported in the draft White Paper the leading activity of people before dying in fire is attempting to escape (35%) while the second leading activity is sleeping (34%). The activity of attempting to escape once the smoke detector provides alert has increased to first place as a result of very flammable furnishings and lightweight construction material. Because of the increased number of people dying during escape the U.S. Fire Administration recently held a symposium during which UL and FM presented

information on lightweight construction and very flammable furnishings validating the need for fire sprinklers.

There has been much discussion on the fire safety of engineered wood and lightweight truss construction materials at the national code hearings – much of it coming from the professional firefighters who will not accept fire fighter death and injury as a result of this "NEW" construction process. How bad is the problem? Well, an Internet search of ***Lightweight Construction Fire Safety*** will identify over ***1.4 million*** results that clearly dimension the emerging fire safety problem. A NIST 2003 Report on Firefighter Fatalities Due to Structural Collapse provides data showing from 1983-1992, an era when legacy construction products were used, 13% of our nation's firefighter deaths due to building collapse were in homes. And this report shows from 1994-2002, the era of new lightweight construction products, 51% of our nation's firefighter deaths due to building collapse were in homes.

It is important that all parties have comfort with these comments on modern construction products and practices. Therefore we must suggest that a couple minutes be spent to review these short videos that validate comments herein. The first video is an investigative report that includes a description of UL testing showing lightweight construction failure.
http://www.cnn.com/video/data/2.0/video/living/2009/12/18/willis.new.housing.fire.danger.cnn.html

Detailed information with links to numerous studies clearly dimensioning today's fire safety problem in new homes can be found at:
http://www.firesprinklerinitiative.org/resources/lightweight-construction-and-firefighter-safety.aspx

There also is concern with modular housing which can be used for 3-6 unit residential occupancies. Many modular housing manufacturers have trained staff who install fire sprinkler infrastructure in the modules at the factory significantly reducing sprinkler installation costs – under $0.50 per sq. ft. The following video underscores the need for fire sprinklers in modular homes.
http://www.myfoxboston.com/video?clipId=7046668&autostart=true

And the floor plan of new homes is more open allowing greater fire loads to free burn in larger compartments. The larger room coupled with new furnishings that burn hotter and quicker and releases more smoke and flame than older legacy furniture, contributes significantly to the safety of the occupants and responding firefighters. This *must read* report from UL shows the fast burning typical with today's furnishings and underscores the rapid fire growth problem when coupled with lightweight engineered wood or "modern" materials as stated in the report.
http://www.ul.com/global/documents/newscience/whitepapers/firesafety/FS_Analysis%20of%20Changing%20Residential%20Fire%20Dynamics%20and%20Its%20Implications_10-12.pdf

Smoke detectors and fire safety public education programs since 1975 have contributed to a reduction in fire deaths. The public education program "crawl low in smoke" and "stop, drop, and roll" has been effective. But the reality is smoke detectors do not save lives – they *give* the home occupant an opportunity to save their life. Unfortunately this opportunity is diminished by new home construction practices (homes collapsing in under 5 minutes), increased fire load with materials used

in new furnishings, greater size of the fire because of larger rooms and energy efficiency containment. And today's fire deaths are disproportionate with the young and elderly being high fire death per population classifications.

This video shows the concerns with smoke detectors. Yes, smoke detectors have con tribute to the saving of lives in fire incidents. http://wallacefd.org/smoke_alarm_report.html

We cannot ignore the fire problem. Builders save substantial amounts of money by using the new modern construction products yet fail to accept code requirements to mitigate fire safety issue emerging from the use of these new products. The Canadian Wood Council funded a study that simply determined a home constructed with modern wood products is just as safe as a home constructed with other fire resistant materials ***if a fire sprinkler system is installed***.

http://www.newswire.ca/en/story/1301555/canadian-wood-council-supports-independent-study-documenting-safety-of-wood-frame-construction

Overall, the report shows that the fire safety of buildings has more to do with effective fire safety systems, such as working smoke alarms and complete automatic sprinkler protection, than with their construction materials. However, there are major concerns if the fire safety systems are removed from the construction process.

We implore the BBRS to completely research and understand the fire safety problem in today's construction environment.

2. Fire sprinkler requirements in one- and two-family dwellings and townhouses were added to all the national model codes because of the fire safety problem emerging from today's construction materials. There is no technical substitute for fire sprinkler systems, at least anything reasonably affordable. The issue here is if fire sprinklers are removed from the adopted codes a significant degrade of the level of fire safety evolves. Even with the actions suggested herein are followed, the cost saving afforded by modern construction materials are far more than the true cost of fire sprinklers.

If fire sprinklers are removed then so should engineered I-beams and all engineered wood products. While there may be some fire resistant coverings of these products, the fire resistant ratings are diminished with the high fire load of modern furnishings. For example, fire services across the national will cite actual examples of one-hour fire resistant barriers failing in under 20 minutes – a common occurrence with today's furnishings. Fire quickly spreads from windows through overhang vents allowing flames to quickly attack engineered wood used in roofing materials. Fully involved attic fires is another common occurrence experienced by fire fighters. The list is long.

Thus, ban engineered wood; ban finger gusset plates; downsize the great room to reduce excessive fire load; greater distances between homes; fire resistant materials used on the exterior of adjacent properties; secondary exits from the second or higher floors; fire escape windows from basements; secondary exit from the basement – again the list is long and the list must include all fire hazard

conditions. For example, if the distance were to be increased between homes, we have not addressed the problem unless we banned engineered wood and the many other items on the list are addressed. The difficult to understand issue with the draft White Paper is the IRC allows a reduction from 2-hour to one-hour fire resistant ratings between units if fire sprinklers are present in townhouses – this offsets or nearly offsets the cost of the fire sprinkler. What problem are we trying to solve or is this White Paper focused on homebuilder profit margins?

3. As an economist, I must say that there exists much irrelevant and disconnected information in the draft White Paper that could cause one to step in the wrong direction. The true economic issue and the far-reaching impact on the community for failing to apply current national model codes has not been addressed in the paper.

Suggesting the cost of fire alarm and fire sprinklers is chasing away potential buyers and destroying the Massachusetts housing market is grossly false and misleading. How many potential buyers are chased away by the $10,000 granite countertop? Median home prices in Massachusetts is over $300,000 – not what one would consider affordable housing.

Housing Economics 101. The builder wishes to build the home at the absolute lowest possible price and sell the home for the absolute highest price notwithstanding what the house is truly worth. Let's clearly understand this process. If a builder plans to build a new home or a townhouse with the targeted price of $300,000 and everything comes in on budget except lumber which is $5,000 under budget, does this mean the builder will now offer this new home for $295,000? If the house next door of an equal square footage sells for $375,000 do you think the target price will remain at $300,000? During the building bubble that burst and caused the recession impacting our nation this was the scenario – "I am only approved for $275,000 from my bank, I love your new home but can't afford it." The builder and or realtor responds, "well we know a mortgage broker who will cover you and the value of the house will significantly increase and in a couple years you can use this increased value for a new mortgage." There are millions of families in foreclosure or underwater that will agree with this statement. Massachusetts' foreclosure rate (1 on every 3,358 homes) is not as bad when compared to other states like Florida (1 in every 372 homes and Maryland (1 in every 557 homes).

Home sales are negotiated – a very small percentage of homes sell for the listed price. If a home or townhouse is listed for $300,000 and I offer $290,000 and the seller accepts, does this mean that the granite countertop is free? Can I argue the fire sprinkler is then free? No, this is all figured into the cost to build the entire house and the buyer is buying the entire house. ***What this entire issue is about is not the home sales market – it is all about builder and realtor profit margin.*** The market has been hamper by changes in the mortgage system, higher down payments for example, all a result to the greed driven home construction bubble that led to the recession. Who gained by selling a house 20-30% more than it was truly worth, the buyer or the homebuilder/realtor?

The National Association of Home Builders and its state affiliates have a major focus of influencing decision makers to reject anything that adds to the cost of construction. While we support this from a contractor's perspective, particularly government imposed impact fees and such, attempting to repeal fire and life safety code requirements is not nor should ever be considered an acceptable

practice. The NAHB and its state affiliates have opposed smoke detectors, ground-fault circuit interrupters, arc-fault interrupters, and fire sprinklers. It is amazing that deaths from falls are listed in the draft White Paper as for many years the NAHB has opposed efforts to change the width and risers of home stairways as these steep almost ladder climbs has been linked to many fall deaths.

There are many other economic concerns not addressed in the draft White Paper - burn injury is just one of those issues. While there has long been data correlating sprinklers with reductions in deaths and property loss, recent research also shows a significant impact on injury cost when sprinklers are present. The cost of burn injuries, in healthcare dollars, is $3.8 billion per year. The average length of stay for a hospital burn patient is 24 days, although it can be months for the severely burned patient. Patients, who do survive acute hospitalization stays, require rehabilitation that is a minimum of seven-times longer than their stays in the hospital, and they may require years of psychological intervention. In addition to the direct health care costs, the social costs of burn injury are staggering. Over one million workdays are lost each year. Human costs are even greater.

- **Sprinklers reduce civilian fire injury medical costs by 53%,**
- **Sprinklers reduce civilian fire injury total costs by 41%.**
- **Sprinklers are responsible for an estimated 65% reduction in firefighter fireground injuries.**

Each year, it is estimated that about one percent, or 2.5 million Americans, sustain a burn injury and one-half will require medical attention or sustain an injury severe enough to restrict some activities of daily living.

- Minor burns, self treated 1,750,000
- Treated by physician (outpatient) 650,000
- Burn patients hospitalized 120,000
- Deaths per year 6,000

Code enforcement can have a major influence on the economic well-being of a municipality and the safety of its citizens. Municipalities that adopt up-to-date, unamended codes — and rigorously enforce them using a sufficient number of trained and certified code-enforcement professionals — minimize damage from natural hazards, fire, and other perils, ultimately reducing insurance costs. But there is more than the ISO Public Protection Classification (PPC) or the most commonly known community insurance grading system. This is a multi-faceted issue; the far-reaching Building Code Effectiveness Grading Schedule (BCEGS) and FEMA Disaster Funding.

The ISO Public Protection Classification is used by insurance companies for rate setting purposes. The BCEGS is used for rate reductions which, depending on the insurance provider can be over 25%. For example Citizens Insurance of Florida, the 9th largest insurance carrier in the nation offers up to a 20% rate reduction based upon the BCEGS grade. But even more critical is the BCEGS is used for rate setting for the *National Flood Insurance Program and is also used by FEMA in determination of Disaster Recovery Funding.* What this critical point means is property owners, both commercial and residential, will pay substantially more for NFIP coverage and receive a smaller percentage of money from FEMA in a community with a bad BCEGS Grade verses one with a good grade.

What does all this mean? Well, if Community A has a BCEGS Grade of 2 and the neighboring Community B has a BCEGS Grade of 5 there could be 15% less FEMA Disaster Recovery Funding

offering to the property owner after a wind-force or earthquake disaster. Let's use an example using two houses of equal value, let's say $300,000, one located in Community A and the other in Community B, each having equal hurricane damage, $60,000 roof and interior damage. The Governor declares a Natural Disaster and FEMA Disaster recovery funding kicks in. FEMA may offer the homeowner in Community A $40,000 to help recover. But the identical home in Community B may only be offered $34,000 or 15% difference. There is a possible 5% change in disbursement between each BCEGS Grade or Community A is a BCEGS Grade 2 and Community B is a Grade 5 or three grade difference = 15%.

So failure to enforce the national model code required fire sprinklers in new residential occupancies could lead to a lower disaster recovery rate for all commercial and residential property in the Commonwealth of Massachusetts.

Again, there are many unsubstantiated findings and much unrelated data in the draft White Paper. And as reported herein, the cost of burn injury, NFIP premium rates, FEMA Disaster Recovery Funding and many other economic factors have not been addressed. The data on fire deaths is non-caring and makes the assumption the lost kids are my kids and not yours. The recommended approach is to table the draft White Paper. The second step would be to establish a research committee to identify economic incentives that would assist in making new construction safe. Washington State passed a law waiving the Fire District Impact Fee for all new homes and townhouses built with fire sprinklers, a cost savings that more than offsets the cost of code compliance. Many communities have waived or reduced water supply connections as they downsize the water infrastructure which is allowed by codes for fire sprinkler protected property. The substantive question in this second step is what can the BBRS do, or recommend to the Legislature to address, that will provide economic incentives for the builders? Rest assured NFSA is available to assist in identifying these economic incentives.

Sincerely,

Buddy Dewar, Vice President
Regional Operations

CC David A. LaFond
National Fire Sprinkler Association
New England Regional Manager