

# **RESIDENTIAL FIRE SPRINKLERS**

## **OVERVIEW**

The International Residential Code (IRC) governs how single-family homes, duplexes and townhouses are built in Nebraska. In the 2009 version of the code it mandates residential fire sprinklers. The Nebraska State Home Builders request that mandatory fire sprinkles be amended out of the IRC for use in Nebraska because:

- Smoke alarms are effective in saving lives and preventing injuries.
- The risks from fire are low.
- Sprinkler systems are expensive.
- The choice should be left to the home buyer and not mandated.

## **STATUS**

- Anticipate reintroduction for the 2011-12 legislative session
- LR 384 Study Resolution on Fire Sprinkler Mandate passed by the Nebraska legislature.
- LB 949 died in the Urban Affairs Committee
- LB 949 introduced in Nebraska Legislature by Senator Gloor.

*See Key Issue titled "State Building Code Adoption" as a related issue.*

## **LEGISLATION**

### **LR 384 Study Resolution**

Introduced by Krist, 10; Coash, 27; Cook, 13; Gloor, 35; Lathrop, 12; McGill, 26; Rogert, 16.

PURPOSE: The purpose of this interim study is to examine the fire sprinkler mandate contained in 2009 building codes. The study shall include, but not be limited to:

- (1) A determination of whether legislative authority is appropriately delegated to a body outside the Legislature, such as the International Code Council;
- (2) An exploration of how cities and counties across Nebraska currently adopt building codes and how such political subdivisions have amended the state building code as authorized in section 71-6406, including changes to reduce unnecessary costs of construction, increase safety, durability, or efficiency, or address special local conditions;
- (3) An examination of what state or local agencies would regulate and enforce regarding the proper installation of fire sprinklers in residential dwellings;
- (4) A study of the 2009 International Residential Code recommendations as to proper installation of fire sprinklers;
- (5) A study of the effect of a fire sprinkler mandate on the new residential housing market, particularly the affordable housing market;
- (6) A study of the effects of installed fire sprinklers on the valuation of residential dwellings;
- (7) A study of the benefits or detriments the installation of fire sprinklers in residential dwellings has on homeowners or renters insurance;
- (8) A study of the safety and effectiveness of fire sprinklers;
- (9) An exploration of what, if any, problems fire sprinklers might present in extreme weather conditions;
- (10) A determination of the appropriate regulation and certification for businesses and individuals that install fire sprinklers in residential dwellings;
- (11) An assessment of the State Fire Marshal's statutory jurisdiction regarding commercial versus residential fire suppression system installation, inspection, and recurring inspections;
- (12) A comparison of required versus optional fire suppression systems;
- (13) An exploration of the role and benefits of various types of fire suppression systems, including water deluge versus chemical application systems; and
- (14) Any other related topics as the committee deems appropriate.

NOW, THEREFORE, BE IT RESOLVED BY THE MEMBERS OF THE ONE HUNDRED FIRST LEGISLATURE OF NEBRASKA, SECOND SESSION:

1. That the Urban Affairs Committee of the Legislature shall be designated to conduct an interim study to carry out the purposes of this resolution.
2. That the committee shall upon the conclusion of its study make a report of its findings, together with its recommendations, to the Legislative Council or Legislature.

### **LB 949 by Senator Gloor**

{ HYPERLINK "<http://nebraskalegislature.gov/FloorDocs/Current/PDF/Intro/LB949.pdf>" }

## **RECOMMENDATIONS**

1. Mandatory fire sprinklers to be amended out of the IRC for use in Nebraska by the Nebraska legislature.
2. Local HBA's are responsible to keep fire sprinklers from being made mandatory in their code jurisdictions.

## **ISSUES BRIEFING**

**BACKGROUND** - The International Residential Code (IRC) governs how single-family homes, duplexes and townhouses are built in Nebraska. In the 2009 version of the code it mandates residential fire sprinklers. This came about as the governance of the International Codes Council allows anyone who is employed by a city to join as a voting member. Unfortunately, this allows special interest groups to become active and vote on single issue items. Such was the case as firefighters joined in droves to mandate residential fire sprinklers. The building code is updated every three years and the years in between are used to consider changes in what is called “code hearings” for the upcoming version of the new code.

At the International Codes Council meeting in Minneapolis in September 2008 at the *“final action for adoption”* of the 2009 IRC an amendment was passed by a vote of 1,283 to 470 to mandate residential fire sprinklers, even though such a requirement had been rejected at the various code hearings leading up to the final adoption of the 2009 IRC. At this meeting about 1,200 firefighters showed up and joined the International Codes Council so they could vote on this one specific issue. About 1,200 voting devices were turned in immediately after the vote suggesting that the uniformed firefighters were there for one purpose only, to mandate residential fire sprinklers by stuffing the ballot box.

Then in November 2009 the performance was repeated at the code hearings in Baltimore for development of the 2012 IRC. Again the firefighters stuffed the ballot box. 1,700 firefighters joined the ICC and the vote was 1,700 to 40. Again the firefighters left after the vote having no interest in other code issues.

The fire sprinkler companies are estimated to reap about \$5.8 billion per year from such action.

Subsequent efforts by the NAHB to remove the mandatory requirements for fire sprinklers from the International Residential Code (IRC) have been abandon. So the 2011 code version will have the mandatory requirements for fire sprinklers. After reviewing the potential outcome and consequences, the Construction, Codes & Standards (CC&S) Committee leadership decided not to submit a public comment challenging the disapproval of these proposals that occurred at the ICC hearings in Baltimore last fall.

By not submitting a comment, the IRC code committee’s recommendation for disapproval will be placed on the “consent agenda” and approved without debate at the ICC final hearings scheduled for May in Dallas.

This decision was not arrived at easily and only after much debate over the pros and cons of not submitting a public comment. Had there been even a remote possibility of winning approval at the final hearings, no such action would have been contemplated. However, given the IRC committee’s recommendation, a two-thirds vote for approval would be required – an insurmountable margin to achieve. In recent code development cycles, the vote supporting NAHB’s position in opposition to fire sprinklers fell well below 50 percent despite our efforts to “get out the vote” of sympathetic code officials. Now, with many fire officials added to ICC’s ranks of voting members, a two-thirds vote is simply unachievable.

Subjecting NAHB's proposals to another round of debate at the final hearings in May would only result in another "get out the vote" campaign by the proponents of fire sprinklers. Taking an action that would once again result in a large number of fire officials showing up at the ICC final hearings is a dangerous proposition. These fire officials would be encouraged to stay and vote on other costly code changes related to fire safety.

Thus with no real hope of prevailing at the final hearings and the potential for collateral damage on other significant code issues, the CC&S Committee leadership felt it prudent not to pursue a challenge on NAHB's proposals. Additionally, future attempts in the national code arena are not recommended.

So the fight against residential fire sprinkler mandates now must be fought at the state and local levels.

**PROPOSITION - The Nebraska State Home Builders request that mandatory fire sprinkles be amended out of the IRC for use in Nebraska because it is smoke alarms which save lives and the International Residential Code (IRC) already requires smoke alarms.**

The Nebraska State Home Builders contends that:

- Smoke alarms have been required in new homes for over 20 years because they are proven effective in saving lives and preventing injuries.
- The risks from fire are low.
- Sprinkler systems have limited effectiveness.
- Sprinkler systems are expensive.
- The choice should be left to the home buyer and not mandated.

Furthermore, it is desirable that the Nebraska Unicameral address this issue concerning the State Building Code to avoid a city by city battle over residential fire sprinklers and a probable legal test over state statute 71-6406 (2) which pertains to the ability of a city to adopt local amendments to the state building code.

**-Smoke alarms have been required in new homes for over 20 years because they are proven effective in saving lives and preventing injuries.**

***In the U.S.***

- Smoke alarms have been required by the building code to be installed in newly built homes for over 20 years.
- Home structure fire deaths fell 45% from 5,200 in mid 1980 to 2,865 in 2007.
- Almost two-thirds of the deaths resulted from fires in homes without working smoke alarms.  
from "Home Structure Fires-January 2009"  
by Marty Ahrens of the Fire Analysis and Research Division of the National Fire Protection Association (NFPA)

- In 2000-2004, the death rate was twice as high when no operating smoke alarm was present (1.13) compared to reported home fires with operating smoke alarms (0.55). In other words, a working smoke alarm in a reported home fire reduces the risk of death by half.
- Assuming a potential for one death per fire, a 100% chance of dying would mean that every fire is fatal, or roughly, 100 deaths per fire 100 fires.....when working smoke alarms are present the chances are 99.45% (100-.55=99.45) vs 98.87% (100-1.13) in home fires with no working smoke alarms.

from "Home Smoke Alarms - January 2008"

by Marty Ahrens of the Fire Analysis and Research Division of the National Fire Protection Association (NFPA)

### In Nebraska

- Over five years from 2004-08 there were 67 civilian fatalities as a result of fires and 83% did not have a working smoke alarm.
- Over five years from 2004-08 there were 207 civilian injuries as a result of fires and 70% did not have a working smoke alarm.

### By Fire Dept

#### From Nebraska Fire

#### Marshall's Office

|                              | Total                | % of Residential Injuries w/o Smoke Alarms | Total                  | % of Residential Fatalities w/o Smoke Alarms |
|------------------------------|----------------------|--|------------------------|--|
|                              | Residential Injuries |  | Residential Fatalities |  |
|                              | Ann Avge             | Ann Avge                                   | Ann Avge               | Ann Avge                                     |
|                              | <u>2004-08</u>       | <u>2004-08</u>                             | <u>2004-08</u>         | <u>2004-08</u>                               |
| Columbus Fire Dept           | 0.4                  | NR   | 0                      | NR   |
| Grand Island City Fire Dept  | 1.2                  | 83%  | 0                      |  |
| Grand Island Rural Fire Dept | 0                    |  | 0                      |  |
| Lincoln Fire & Rescue ***    | 0                    |  | 0.2                    | 100%   |
| Kearney Fire Dept            | .2                   | 0%   | .6                     | 100%   |
| Norfolk Fire & Rescue        | 5.2                  | 43%  | 1.2                    | 100%   |
| North Platte Fire Dept       | 1.6                  | 75%  | 0.2                    | 100%   |
| Omaha Metro Area             | 10.2                 | 80%  | 2                      | 100%   |
| Omaha Fire & Rescue          | 7.8                  | 76%  | 2                      |  |
| Ralston Vol Fire & Rescue    | 0                    |  | 0                      |  |
| Bellevue Vol Fire Dept       | 2.4                  | 91%  | 0                      |  |
| Gretna Vol Fire & Rescue     | 0                    |  | 0                      |  |
| LaVista Vol Fire & Rescue    | 0                    |  | 0                      |  |

\*\*\* Did not report years 07 & 08

## -The risks from fire are low

### In the U.S.

- The 399,000 home fires reported in 2007 are 46% lower than the 734,000 reported in 1980.

from "Home Structure Fires-January 2009"

by Marty Ahrens of the Fire Analysis and Research Division of the National Fire Protection Association (NFPA)

**In Nebraska**

- According to the U.S. Census in 2008 there are 702,292 occupied housing units in Nebraska.
- According to the Nebraska Fire Marshall’s Office there was an annual average of 692 residential fires per year from 2004-08.
- From 2004-08 the annual average for new home construction was 6,999 units all of which had smoke alarms as required by the IRC.
- According to the U.S. Census in 2008 there were 10,561 occupied housing units in the City of Norfolk. According to the Norfolk Fire Department there was an annual average of 23 residential fires per year from 2004-08.
- There were 10 residential civilian injury fires and fatal fires reported in Norfolk from 2004-2008. A check with the Madison County Assessor’s Office reveals the average age of those homes was 61 years old. The youngest was built in 1980 and the oldest was build in 1917.

**By Fire Dept**

| <u>US Census Occupied Housing Units</u> | <u>Single Family Starts Ann Avge 2004-08</u> |                                      | <u>Total Residential Fires Ann Avge 2004-08</u> | <u>% of Residential Fires w/o Smoke Alarms Ann Avge 2004-08</u> |
|---|--|--------------------------------------|---|---|
| 9,109                                   | 67   | <b>Columbus Fire Dept</b>            | 10.6  | NR  |
| 18,427                                  | 185  | <b>Grand Island City Fire Dept</b>   | 18.8  | 80.9%   |
|   |  | <b>Grand Island Rural Fire Dept</b>  | 4.2   | 81.0%   |
| 106,309                                 | 1,084  | <b>Lincoln Fire &amp; Rescue ***</b> | 6.2   | 77.4%   |
| 11,121                                  | 188  | <b>Kearney Fire Dept</b>             | 10  | 60%   |
| 10,561                                  | 82   | <b>Norfolk Fire &amp; Rescue</b>     | 23  | 60%   |
| 11,176                                  | 52   | <b>North Platte Fire Dept</b>        | 11.2  | 85.7%   |
| 196,943                                 | 2,857  | <b>Omaha Metro Area</b>              | 220.6   | 79.1%   |
| 171,475                                 | 2206   | <b>Omaha Fire &amp; Rescue</b>       | 198.4   | 77.7%   |
| 2,601                                   | 1  | <b>Ralston Vol Fire &amp; Rescue</b> | 3.6   | 88.9%   |
| 17,439                                  | 359  | <b>Bellevue Vol Fire Dept</b>        | 11  | 89.1%   |
| 917                                     | 141  | <b>Gretna Vol Fire &amp; Rescue</b>  | 3.8   | 89.5%   |
| 4,511                                   | 150  | <b>LaVista Vol Fire &amp; Rescue</b> | 3.8   | 84.2%   |

\*\*\* Did not report years 07 & 08  
From Nebraska Fire Marshall’s Office and US Census

**-Sprinkler systems have limited effectiveness**

**In the U.S.**

- In a research paper titled “U.S. Experience With Sprinklers & Other Automatic Fire Extinguishing Equipment” published by the NFPA in January 2009 and written by staff member John Hall. One finds on page 16 that a residential sprinkler system was effective 98% of the time **when the system operated**. However on page 38 the percentage of one and two family dwelling fires where sprinklers operated was only 40% of the time. This figure is further reduced by 2% where the system operated and was not effective. So in reality homes

with sprinklers that have a fire, the sprinkler system is effective only 37% of the time. The reason given for this is the fire was too small to activate the system. However fire always produces some smoke to activate a working smoke alarm and give warning to the inhabitants.

- On the NFPA web site Marty Ahrens responds and clarifies this fact saying it is a good thing that sprinklers do not operate in small fires and goes on to site the sprinklers effectiveness is in situations were fires spread beyond the room of origin. He goes on to point out these are only 23% of all home fires but 77% of the home fire deaths resulted from these type of fires.

### **In Nebraska**

- Considering these facts for all of Nebraska, sprinklers would have the most potential to be effective in approximately 30% or 207 home fires out of the annual average of 692 home fires per year from 2004-08.
- In the Omaha metro area where you have 196,943 homes and out of that number you would have only 66 home fires on an annual average where sprinklers have the potential to be effective.
- Would sprinklers save lives? Perhaps that is a possibility. However, it is well known people die from smoke inhalation before they actually burn. It is unfortunate that in situations were sprinklers are most effective the fire has to burn a while to get hot enough to set off the sprinkler head all the while producing deadly smoke.
- Again fire produces some smoke to activate a working smoke alarm and give warning to the inhabitants. This early warning from the smoke alarm is much more effective to save life and limb and every new home is required by code to have hard wired smoke alarms.

## **-Sprinkler systems are expensive**

### **In the U.S.**

- According to the Fire Protection Research Foundation in 2008 a review of 30 different floor plans in 10 cities that mandate fire sprinklers, the average cost was \$1.61 a sq ft. Annual discount savings averaged \$22, or 5-10% of the annual insurance premium.

### **In Nebraska**

- Current quotes in Nebraska to install fire sprinklers in a home currently range around \$1.75 to \$2.00 a sq ft. We have requested quotes based on a 1,525 sq ft ranch and a 2,200 sq ft with a walk out basement. At a \$1.75 sq ft that amounts to \$2,668 for a 1,525 sq ft ranch and \$3,850 for a 2,200 sq ft with a walk out basement. These numbers do not include the cost to upgrade from a 3/4" water service to a 1 1/2" which is necessary to get the 26 gpm required by a residential fire sprinkler system.
- In Lincoln the additional cost of upgraded water service and Water/Wastewater Impact fee increases and you have a total additional cost of \$7,250 added to the square ft cost.
  - The cost for an upgrade from a 3/4" service to a 1 1/2" is \$1,375 for tap and water meter plus \$1,150 in labor and materials or a total of \$2,525.
  - Add the Water/Wastewater Impact fee which is \$2,026 for a 3/4" line and \$6,751 for a 1 1/2" line this is a cost increase of \$4,725.

- In Omaha the additional cost of upgraded water service is an increase of \$4,700. MUD charges for tap and water meter is \$2,700 plus \$1,500 in labor and materials and a \$500 for a Pressure Reducing Valve.
- Where homes are not connected to a public water supply you will have to add additional costs for a reservoir and the expense to protect it from freezing.
- Additional costs, which are not quantifiable, are an annual inspection fee and alarm monitoring of the system to alert someone of water leaks while the home owner is away, this is a rare occurrence but a reality none the less.

### **-The choice should be left to the home buyer and not mandated.**

- LB 949 allows cities to require that the new home builder present to the prospective new home buyer the option to purchase a home sprinkler system.

### **In conclusion the Nebraska State Home Builders contends that:**

- 1. Smoke alarms have been required in new homes for over 20 years because they are proven effective in saving lives and preventing injuries.**
- 2. Sprinkler systems have limited effectiveness.**
- 3. Sprinkler systems are expensive.**
- 4. The choice should be left to the home buyer and not mandated.**

The contention that residential fires and the associated fatalities and injuries justify the requirement that 6,999 new homes annually in Nebraska must have fire sprinklers installed to affect those losses is simply an inaccurate expectation and unfair burden.

Furthermore, the adoption of LB 949 avoids the potential outcome of a battle over this issue on a city by city basis and a probable legal test of a city's ability to amend the state building code as provided by state statute 71-6406 (2).

## **COUNTER PUNCHES**

**Builders like to tell of the quality homes that they build** and that they build with standards for flame spread and smoke. The fire community will counter such arguments with things like great rooms, open spaces, 9-14ft. ceilings; all these features provide a greater volume of air and allows the fire to grow and smoke to spread more rapidly. Open floor plans mean more air, more fuel, easier room to room fire communication. Plus they will talk about the changing building materials. That the structural components have changed considerably from old growth lumber to engineered lumber. Windows are now vinyl framed. These newer windows fail substantially faster than old windows. Solid core doors have been replaced by composite doors and they don't



