



SPRINKLER MARKET HEATS UP

The number of residential fire sprinkler (RFS) systems being installed in Canada is on the rise, albeit slowly. As this trend evolves, qualified trades people stand poised to develop an exciting market opportunity in the residential construction sector. The cost of these systems

has long been an issue. In considering the cost, one must look at both the initial capital costs and continuing operating costs.

An article in the *Ontario Fire Service Messenger*, a publication of the Fire Marshall's Office, reported that the installation of a home sprinkler system in a new home is estimated to cost one to 1.5 per cent of the home's cost. The question begs itself then, as installations are on the rise, why do some homebuilders and homeowners consider RFS systems a good investment?

MANDATORY REQUIREMENT

Part of the reason may be one of capitulation rather than pure choice. Many jurisdictions throughout North America (see sidebar), such as the City of Vancouver (April 30th, 1990), have adopted local bylaw amendments that make RFS systems mandatory in new single family construction.

What are the motivating factors? By

mandating sprinklers, local authorities may be able to forestall investments in infrastructure such as water treatment facilities, capacity upgrades to water distribution mains, and construction of new facilities such as fire halls. In addition, when homes in a given develop-

“By mandating sprinklers, local authorities may be able to forestall investments in infrastructure such as water treatment facilities, capacity upgrades to water distribution mains, and construction of new facilities such as fire halls.”

ment are sprinkled, the distance between fire stations serving that area is greater than would be possible without sprinkled homes.

A visit to firesafefhome.org, the website of the Residential Fire Safety Institute (RFSI), revealed some interesting data:

1. One example discusses a city that “recently projected seven (fire) stations

for a new development if sprinklers are not required, but only three if everything is protected with sprinklers. At an average cost of \$1 million US per year to staff a fire station with just three firefighters around the clock, the sprinkler requirement will save the city four million dollars US per year.”

2. The same report discusses the impact of water use and fire main sizing. “For example, when the City of Scottsdale, Arizona adopted a residential sprinkler ordinance, the estimated savings in water

costs was seven million dollars”.

These are only a few of the more compelling reasons that motivated the City of Vancouver to adopt such requirements. Since the Vancouver move, many other communities in the Lower Mainland area of BC have made RFS systems mandatory, the most recent being the District of Maple Ridge, one of the region's fastest growing municipalities (July 2005).

NEW CONSTRUCTION

In areas where they are not mandatory, what would motivate a developer to include RFS systems in a new project? Here the RFSI site lists reasons that are even more compelling. There are trade-offs made between the developer and the local jurisdiction concerning increased development density. Sprinkled structures may allow for reduced fire department access to building sides, they may allow for narrower streets, fewer parking restrictions and dedicated parking spaces, and



In Ontario more than 400 people died in house fires between 2000 and 2003.

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longer cul-de-sacs, to name a few.

In addition the builder may have reduced (or exempted) plan and permit fees. Further, when you consider that the builder has discretion over the disposition of any cost savings, and the cost of the RFS will accrue to the home buyer as part of the home price, RFS systems can significantly increase the profitability of a given development.

Finally, what motivates a potential homeowner to want a sprinkled home? Like the other stakeholders, part of the answer is for financial reasons. Insurance discounts may be available to homeowners. In the United States firehouse.com reports "Insurance from home underwriters will vary depending on type of coverage. The discounts now range from five to 15 per cent, with a projected increase in available discounts." Further, if the developer can save money in services and fees, and can build to higher densities, this may be reflected in lower purchase prices for homes within the devel-



Life safety is an obvious motivator for homeowners considering RFS systems.

opment or in getting more home for the money.

Life safety is also a prime motivator for families with small children, and those who live with family members who are infirm, physically challenged or elderly and therefore have limited mobility. By slowing down the fire and notifying family members about the presence of a fire, an RFS system can provide valuable time to exit the building that likely would not be possible in the absence of such a system.

The *Ontario Fire Service Messenger* reports that since RFSs "became mandatory in Vancouver, the city has experienced no fire deaths in a home protected by functioning sprinklers. Between 2000 and 2003, 414 people died and \$1.57 billion in property was lost to fires in Ontario."

DESIGN CONSIDERATIONS

Whom and what governs the design and installation of RFS systems? In most cases it is the local jurisdiction having authority that reviews the design as part of the permit application and approvals process. RFS system installations are generally undertaken in accordance with, and are governed by, the design guidelines as developed by the National Fire Protection Association (NFPA), specifically the NFPA 13-D Guidelines. Originally developed in 1980, the NFPA 13-D Standard has evolved as new con-

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struction products and practices for installation have entered the residential construction market.

This leads to a discussion of the types of systems available. A dedicated wet alarm system is, as the name implies, full of water. A dedicated dry-pipe system is charged with air and would be employed in circumstances where the system may be subject to very cold temperatures and freezing conditions. In the past, a residential system installation would have been limited to a stand-alone wet system, as dry-pipe systems are not suitable for residential. However a new voice is now being heard as part of this discussion.

In 1985 the NFPA amended the NFPA 13-D guidelines allowing for a new variation of the standard wet alarm system, this being the multipurpose system. The principal behind this design application is quite ingenious in that it combines the RFS system into the home's potable water distribution system. Thus, the piping grid is designed to serve the purposes of both systems.

According to David Killey, manager of Fire Busters Inc. in Delta, BC, there are

two principle benefits to be gained from either this design or the modified flow through design adopted by the City of Vancouver on May 12, 1993. One would be the elimination of the backflow prevention device separating typical dedicated wet alarm fire protection systems from the potable water supply. These are required because in a wet alarm system, the water sits stagnant in a closed piping grid and is not of potable quality.

In a multipurpose system, just as with the modified flow through system, the water quality of the potable system is maintained by a constant flushing of the system through usage. With the elimination of the backflow device, there is no need for annual testing and certification. Many jurisdictions require this to ensure the continued performance of these devices.

If such service was required, Killey indicated that for "Vancouver homes equipped with a testable device, the going rate today is \$65.00 for a double check valve assembly (DCVA) test and full inspection of the sprinkler system."

The other benefit is related to system



Photo Uponor-Canada

Licensing requirements vary for RFS system installers.

function. "If the plumbing system does not provide running water, this will not go unnoticed. Thus system function would be better ensured and failures relating to lack of water (ie: closed supply valves) should be a thing of the past," said Killey. Since there are no separate system supply valves in a multipurpose system, it is less likely that a homeowner might inadvertently turn off the water supply, as may be possible in a dedicated wet alarm system installation.

Proponents of the multipurpose system approach offer other possible benefits including:

1. The elimination of a dedicated water service and meter set for the fire protection system (not required in all jurisdictions).
2. The elimination of the flow switch and local alarm components.
3. The potential for savings upon initial installation by combining the piping grid (compared to two separate and dedicated systems).
4. As it is now part of an engineered piping system, the performance of the potable (or plumbing) component of the system can benefit in terms of greater and more consistent flow characteristics at point-of-use.

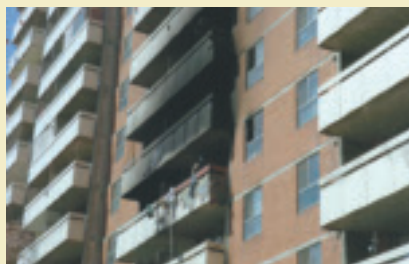
INSTALLATION REQUIREMENTS

Kevin Price, Wirsbo Aquasafe product

Ontario MPP Pushes RFS To Forefront

With the exception of those in British Columbia, all of the more than 220 North American jurisdictions requiring residential sprinkler systems are located outside of Canada. That may change in the not too distant future.

Linda Jeffrey, Member of Provincial Parliament for the Ontario riding of Brampton Centre, is once again introducing a private member's bill which would see residential sprinkler systems become mandatory in all new residential construction. Bill 141, the Home Fire Sprinkler Act, 2004, would have amended the Building Code Act, 1992. It passed second reading but did not make it out of the Standing Committee on the Legislative Assembly. In the original bill, Jeffrey's proposed legislation would have made the installation of fire sprinklers mandatory in new detached, semi-detached and row houses. She has expanded the bill to include condominiums and multi-family residential.



If passed, a private member's bill will make sprinkler systems mandatory in all new residential structures in Ontario.

"We need to step forward and provide the best possible safety technology available," said Jeffrey. "I have evidence showing people are prepared to pay 4.6 per cent more to put this in their home." The original bill had all party support. While she noted that homebuilders are resisting the bill, Jeffrey was in discussions with a progressive homebuilder who expressed interest in installing sprinklers in model homes. She intended to table the new bill at the end of October (2005).

For more information visit www.lindaajeffrey.onmpp.ca.

or high ppm levels. However, the detection limits for some absorptive infrared monitors can be well above the TLV of many gases.

In order to achieve the required ppm level of detection, these instruments need to have longer sample chambers, increasing the overall size of the monitor, as well as the cost.

CONSIDERING CROSS-SENSITIVITY

The ability to differentiate between various gases that may be present within a single sample is known as cross-sensitivity. This is a key factor to consider when selecting refrigerant gas detection technology. When testing for a refrigerant, it is quite possible that another gas with similar absorption characteristics is present in the chamber. Even ambient air can cause cross-sensitivity problems due to the variability of carbon dioxide or relative humidity in the atmosphere.

For example, if a monitor is cross-

sensitive to CO₂, merely breathing on the monitor can cause a false reading. Like other infrared monitors, photoacoustic units are designed to minimize cross-sensitivity through the use of specific optical filters which allow them to achieve the sensitivity and selectivity required for low ppm detection.

These monitors can currently detect more than 100 common industrial gases including refrigerants, carbon monoxide, carbon dioxide, cleaning agents, heat transfer fluids, and a host of common industrial chemicals.

CHOOSE WISELY

Photoacoustic IR monitoring systems can be expanded to sample up to eight separate locations. Additional sensors can be added within the same instrument enclosure to monitor non-infrared detectable gases. Options include a catalytic bead sensor for combustible gas detection and electrochemical sensors for

monitoring oxygen, carbon monoxide and other toxic gases.

Absorptive infrared monitors are often a suitable choice in gas detection, particularly when higher detection levels are acceptable. However, when the situation calls for an extremely low-level alarm in the presence of other gases and when reliability is critical, photoacoustic IR monitors may be the best choice. **HPAC**

■ *Allan Roczko, who is product line manager in MSA's instrument division, can be reached at 724-776-8600. For more information visit www.msanet.com.*

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development coordinator with Uponor Canada addressed the issue of licensing requirements for contractors installing RFS systems. According to Price, "The Province of BC is the only jurisdiction where it is a requirement that licensed sprinkler fitters install NFPA-13D systems. In addition, the Schedule A, B1, B2, and Schedule C is also only a BC requirement."

Therefore the City of Vancouver, requires installers to be licensed sprinkler fitters in addition to holding Plumbing Trades Qualification Certificates in order to install multipurpose systems in accordance with its by-laws. If not, the job has to be performed by two separate tradesmen, which raises practical concerns as to who will install what portions of the piping grid, and who will control when and how will the grid would be tested?

However, it seems that the market has taken care of this issue. "We have installed systems in BC and in reality we have used plumbing contractors who employ sprinkler fitters, we have used

plumbing contractors who sub-contract the sprinkler portion and we have had sprinkler companies that subcontract the plumbing portion," said Price. In areas outside Vancouver or the province of British Columbia the regulatory process differs according to Price.

"In all other jurisdictions that we have come in contact with, they utilize a permit process if one is in place. In a number of areas the whole residential sprinkler system market is totally new and they have nothing in place so it's basically a process where we demonstrate that our system meets all requirements with respect to NFPA-13D, cULus listings as well as CSA and NSF approvals."

DRIVING SALES

So, what is the RFS system trend in the context of single family homes? "Residential sprinkler system installs are on the rise but remain a slow moving product in general. There is a shift in the wind however, and some home builders are starting to come on board and offer

sprinklers as home upgrades. Home buyers are looking for quality construction and a healthy, safe environment which is also fuelling increased sales," said Price.

It is safe to say that as more jurisdictions choose to mandate RFS systems, opportunity and competition in this market sector will grow. This will influence the viability of all installation methods and materials, and help to shape the future of the RFS market in Canada. **HPAC**

■ *Mark Evans is a 20-year veteran of the plumbing and heating industry, with sales and management experience in the wholesale distribution, rep agency and manufacturing sectors of the business. Reach him by e-mail at writemarkevans@hotmail.com.*

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