POSITION STATEMENT

Home Smoke Alarms

Submitted by the Fire & Life Safety Section Board

The International Association of Fire Chiefs (IAFC), through its Fire & Life Safety Section (FLSS), is adopting this position paper on residential smoke alarms so the fire and emergency service can better respond to inquiries and effectively develop community risk reduction outreach programs. [1]

What do most home fire fatality scenarios have in common? Lack of awareness that there is a fire until there is too little time to escape or to rescue the victims. Smoke alarms are a very cost-effective way to provide early detection and valuable extra time. But even 40 years since their introduction, a large segment of the population lives with too few or no working smoke alarms. Typically, those in high-risk population groups such as low-income earners, those living in rural areas, older adults, and those with disabilities are in the greatest need of support.

Working Smoke Alarms Continue to Save Lives

Smoke alarms that are properly installed and maintained play a vital role in reducing fire deaths and injuries. Studies of homes with reported fires reveal the risk of dying is twice as high in homes without working smoke alarms than in homes with working smoke alarms.

Home Escape Times Are Reduced to Three Minutes

Modern homes contain a large quantity of synthetic furnishings which ignite and burn faster than natural materials such as wood and cotton. Full-scale fire tests suggest that escape times in homes can be as little as three minutes due to the increased heat-release rates and open-concept floor plans. Early smoke detection and alarm notification becomes more critical so occupants can escape before conditions become untenable.

[1] This position paper supersedes previous IAFC smoke alarm position papers.

Coverage Throughout the Residence
Because fires can spread rapidly through homes, having enough properly located smoke alarms is essential to maximize the amount of available escape time. NFPA 72 requires smoke alarms to be installed inside every sleeping room, outside each sleeping area and on every level of the home.

Smoke Detection Technologies
There are two types of common smoke detection technologies currently in widespread use. Ionization smoke alarms are quicker to warn about flaming fires. Photoelectric alarms are quicker to warn about smoldering fires. Smoke alarms with multiple sensing technologies are also available, and additional technologies may be entering the marketplace in the next several years to meet more stringent listing requirements that become effective in 2020.

The International Association of Fire Chiefs (IAFC) believes that having working smoke alarms of any detection technology is the most important consideration for protecting occupants.

While a properly installed and maintained smoke alarm of either technology provides a critical baseline of protection, for an enhanced level of protection the IAFC encourages the installation of at least one smoke alarm of each detection technology or dual-sensor alarms in the home. The alarms should be tested and listed by a nationally recognized testing laboratory such as UL or ETL.

Finally, the IAFC does not support legislation and regulations that would require a particular smoke detection technology as it may preclude or inhibit the use and advancement of new smoke detection technologies.

Interconnected Smoke Alarms
Interconnecting smoke alarms (when one detects smoke, they all sound) allows for faster notification of occupants in areas remote from where initial ignition occurs in the home. Wireless interconnected smoke alarms provide a solution for existing homes without AC hard-wired interconnected smoke alarms. Interconnected smoke alarms allow families to sleep with their bedroom doors closed, which plays a critical role in slowing fire or dangerous gases from entering rooms.

Battery Considerations
Smoke alarms in new homes are required to be AC powered with standby batteries. Smoke alarms in existing and remodeled homes can be battery powered. There are two types of battery-powered smoke alarms, (a) smoke alarms with a replaceable battery designed to operate one year or more, as described in the manufacturer’s instructions, and (b) smoke alarms with nonreplaceable batteries designed to

operate for at least 10 years before replacing the entire alarm. All battery-powered alarms will produce a low-battery chirp.

One concern with smoke alarms with replaceable batteries is that the battery may be removed to silence both unwanted alarms and low-battery signals. In fires where smoke alarms were present but did not operate, almost half (46%) of the smoke alarms had missing or disconnected batteries, and dead batteries caused one-quarter (24%) of the smoke alarm failures.

Smoke alarms with nonreplaceable batteries have the advantage of not requiring occupants to replace batteries on a regular (e.g. annual) basis, which addresses the problem of users removing the battery. However, at their end-of-life (after ten years), these smoke alarms must be replaced since the battery is nonreplaceable. Since the long-life alarms are fairly new to the marketplace, there are no statistics that identify the percentage of these units that are actually replaced. This is something that will need to be addressed by jurisdictions and their community risk reduction programs.

The IAFC recognizes the value of smoke alarms with both one-year replaceable batteries and ten-year nonreplaceable batteries, and encourages smoke alarms with long-life, nonreplaceable batteries to be used as an option where battery-powered units are allowed. However, it is recognized that units with long-life, nonreplaceable batteries may preclude the use of features such as wireless interconnection and multi-sensor detection technology.

Reducing Unwanted Alarms

When smoke alarms activate for reasons other than actual fires, people may disable their alarms. Smoke from cooking is the biggest source of unwanted alarms. Smoke alarms should not be placed within ten feet of a fixed cooking appliance because smoke from normal cooking can produce unwanted alarms, and frequent unwanted alarms can result in the occupants disabling the smoke alarm. Ionization smoke alarms are more susceptible to unwanted cooking alarms than photoelectric smoke alarms. NFPA 72 has specific requirements for how close both types of smoke alarms can be placed near cooking appliances, which are also included in the installation instructions provided with the alarm. All smoke alarms are susceptible to false alarms caused by steam so they should not be installed near bathrooms containing showers or tubs.

Smoke alarms may contain an alarm silencing (hush) feature which will silence the audible alarm and temporarily desensitize the smoke detection levels for up to 15 minutes. This feature is to be used only when a known alarm condition, such as smoke from cooking, activates the alarm. Fire officials should make sure that

people understand the importance of using the hush button rather than disabling the alarm.

Testing, Reliability and Replacement of Smoke Alarms
Smoke alarms do not last forever and should be replaced when they fail to respond to monthly push button tests, but no later than ten years from the marked date of manufacture. Both NFPA 72 and the 2018 International Fire Code have adopted requirements for smoke alarms to be replaced after ten years. The ten-year anticipated smoke alarm life is based on failure analysis of the unit's circuitry. In addition, the loss of function of a smoke alarm that fails may not be noticed by the occupants unless they operate the test button on the smoke alarm, which in many cases is not done on a regular basis. Fire chiefs may address replacement of old smoke alarms through code enforcement, public education or with the assistance of other stakeholders such as landlords and real estate agents.

Home Safety Visit Programs
A home safety visit program to install smoke alarms in your community can make a measurable difference in reducing deaths and injuries from fire. For assistance in setting up an effective program, NFPA provides documentation on "Planning and Implementing a Successful Smoke Alarm Installation Program" [Web version (PDF, 1 MB) Print version (PDF, 5 MB)]. This includes a comprehensive guide including everything you'll need to get started, from tips on how to select partners, to pointers on soliciting donations and publicizing your program. In addition, see www.homesafetyvisit.org from Vision 20/20.

Conclusion
Working smoke alarms and the early detection and notification they provide are the most cost-effective way to save lives of occupants and reduce the risk to firefighters. The IAFC/FLSS stresses the importance for fire chiefs to educate the community and their staff to understand issues related to home fires and smoke alarms, to be aware of factors that may prevent smoke alarms from operating, and to take all possible steps to minimize these risks through enforcement, public education and interaction with other stakeholders in the community.

SUBMITTED BY: IAFC Fire & Life Safety Section
ADOPTED BY THE IAFC BOARD OF DIRECTORS: 24 July 2017