



NEMA Position Statement on 10-year Mandates

Issue: Smoke Alarms

Smoke alarms save lives, and according to the National Fire Protection Association (NFPA), civilian home fire deaths have decreased 59 percent nationally from 5,865 in 1977 to 2,380 in 2012,ⁱ despite a 43 percent increase in the U.S. population.ⁱⁱ Over roughly the same period of time, NFPA estimates that the percentage of U.S. homes with at least one smoke alarm has risen by 74 percent.ⁱⁱⁱ This is why the installation and use of smoke alarms are promoted by fire and life safety experts around the world.

Although the data indicates an overall reduction of fire deaths over the past 35 years, more recent data indicates that the rate of decline appears to be leveling off.^{iv} One reason for this recent trend may be that one- and two-family dwellings are often left without smoke detection protection due to occupants not maintaining their smoke alarms in an operable condition. A Consumer Product Safety Commission (CPSC) study^v showed that disabled smoke alarms counted for roughly 20 percent of the smoke alarms installed in U.S. homes, and that intentional disabling due to frequent unwanted alarm activations and failure to replace dead batteries are the two leading causes of inoperable smoke alarms.

Members of the National Electrical Manufacturers Association (NEMA) are committed to supporting technological advancements and changes to national consensus codes/standards that will increase the number of operational smoke alarms in U.S. homes. Over the past two revision cycles, NFPA 72 *National Fire Alarm and Signaling Code*[®], the *International Residential Code* (IRC), and the *International Fire Code* (IFC) have been updated to include measures designed to reduce the incidence of unwanted alarm activations and subsequent disabling of smoke alarms by consumers. Another effort to address these issues has been the introduction of a non-removable, or “sealed,” smoke alarm battery that is capable of powering the device for 10 years (i.e., “10-year battery”).

Recent years have seen the introduction and/or passage of legislation in various states and cities aimed at requiring *all* smoke alarms relying on batteries as a primary power source to be powered by sealed 10-year batteries (i.e., “10-year mandate”).^{vi} NEMA recognizes that there are various stakeholder groups in favor of these laws because they believe that this technology enhances life safety by providing longer battery life while preventing consumers from removing the batteries. While NEMA supports the advancement of technologies that improve life safety, NEMA does not support legislation that attempts to mandate one type of life safety technology in a given market at the exclusion of other important technologies.

Position:

NEMA’s position is that consumers should be free to choose which smoke alarms are present in their homes, provided those devices comply with consensus codes and standards. Consumers, not state legislatures, should decide whether alarms powered by 10-year batteries ultimately address consumer needs. Further, it is clear that the imposition of 10-year mandates not only precludes some *current* technologies, but could also preempt the introduction of future technologies in a given state. Life safety is among the most innovative and dynamic of U.S. manufacturing industries; NEMA members are constantly working to develop new smoke detection and communication technologies to enhance consumer protection. The result of these efforts is an evolving marketplace which will continue to benefit the consumer for years to come. NEMA does not want to see this evolution stifled by preclusive legislation.

Did You Know?

- NEMA Members include industry leaders and innovative small businesses that manufacture products used in the generation, transmission and distribution, control, and end-use of electricity.
- NEMA promotes safety, innovation, interoperability, environment, and market enhancement through advocacy, business information, and standards for products, systems, and technologies.
- NEMA publishes over 600 standards, application guides, white papers, and technical papers.
- NEMA responds to codes and standards proposals of other organizations in the U.S. and around the world, facilitating the development of international and North American harmonized standards.
- NEMA was named in the Energy Independence and Security Act of 2007 to work with federal agencies on efforts to enhance the efficiency, sustainability, and security of the electricity grid. As part



There are currently several important life safety features that are not supported by a 10-year battery. Under the imposition of a 10-year mandate, consumers would be precluded from purchasing and installing battery-operated smoke alarms with these features in their homes. These features include wireless connection capabilities, multiple sensing technologies, and enhanced waking effectiveness for susceptible sub-populations:

Wireless Connection Capabilities

Most states that have adopted sealed, 10-year battery requirements have exempted devices that interconnect wirelessly (e.g., when one alarm signals an alert, all connected alarms signal an alert). Interconnected alarms can reduce death rates by half compared to having only a single alarm in the hallway.^{vii} Wireless interconnection now makes it possible to retrofit existing homes with this lifesaving technology using battery operated devices, instead of needing an electrician to install hardwired devices. States adopting exemptions for wireless interconnection devices have properly recognized the benefits of this important and power intensive technology.

In addition to traditional wireless interconnection between alarms, the development of internet-enabled home products (also known as smart home or Internet of Things technologies) now allow devices employing Wi-Fi or other local area network (LAN) connectivity to send mobile notifications through a user's smartphone or tablet. These mobile notifications include alerts of low-battery levels (e.g., well before the device reaches critical power levels), sensor failures, and alarm events. Notifications provide users with important information that enables them to take timely action to ensure that they have working alarms installed, and keeps them aware of potential dangers in their homes. These devices also receive automatic software updates, which keeps them up to date and even improves their operation over time. Adopting a broad mandate for non-removable, 10-year battery devices risks stifling the adoption of these technologies, and in many cases may preclude them entirely.

Alarms with Multiple Sensors

Many smoke alarms on the market today use one or more sensors to not only detect smoke, but also other hazards associated with fire, such as heat or certain toxic gases. These products are referred to as "multi-criteria" alarms. Multi-criteria devices not only detect the unique characteristics of each sensor, but using the sensors together may also provide resistance to unwanted false alarms. These alarms offer enhanced responsiveness to a broad spectrum of fires as opposed to alarms with only one type of sensor. Additionally, multi-criteria alarms may one day be required to comply with the industry standard, which undergoes regular revision and updates. Due to the level of power required to operate an alarm with more than one sensor, and the fact that many sensors may not have a 10-year life span, there is not currently a multi-criteria alarm that comes with a 10-year battery.

Low Frequency Audible Alarms (Enhanced Waking Effectiveness)

Section 29.3.8.1 of the 2010, 2013, and 2016 editions of NFPA 72 requires a 520 Hz low-frequency audible alarm signal for those who identify themselves as having hearing loss. This audible alarm signal has been proven to have enhanced waking effectiveness for this and certain other high-risk groups such as the elderly, school-age children, and people who are alcohol-impaired. Low-frequency sounders consume significantly more power than the conventional 3KHz sounder. As a result, smoke alarms that employ them are not able to provide 10-year service life at this time.

of this, NEMA has been instrumental in the Smart Grid Interoperability Panel (SGIP) and the National Institute of Standards and Technology (NIST) Smart Grid Federal Advisory Committee.



Importance:

Because NEMA believes that consumers should be free to decide which life safety technologies will be present in their homes, we do not support legislative mandates that restrict consumer choice. However, we understand that some state legislatures may believe that smoke alarms with sealed 10-year batteries are effective keeping operational smoke alarms in consumers' homes and, therefore, will pass a 10-year mandate in spite of the preclusion of other important life safety technologies. In these instances, NEMA makes the following recommendations:

- 1) The legislative language should contain exemptions for key life safety technologies, such as those listed above.
- 2) The mandate should incorporate a realistic effective date for the law. The industry requires sufficient time to design, manufacture, test, and obtain third-party certification/listing for new products. This process, while lengthy, incorporates the best practices from the life safety industry.
- 3) The scope of the law should not include detection devices connected to a control panel (e.g. smoke detectors) either by wires or wirelessly. There are important and relevant differences between smoke *alarms* and smoke *detectors* in terms of performance requirements in the respective product standards. For example, applicable codes and standards^{viii} require smoke detectors to send a signal to the control panel every 200 seconds to confirm that the detector is working properly, that the battery is fully operational, or, conversely, that there is a malfunction, if one occurs. Due to the amount of power required for this and other functions, there are no batteries capable of providing power to a smoke detector for a 10-year period.

NEMA hopes that consumers will continue to be vigilant in testing their own smoke alarms regardless of the detection or battery technology that those alarms employ. While a long-life, sealed-in battery may eliminate the need to replace batteries, it does not eliminate the need to test an alarm—the only way to ensure a smoke alarm is still operating is to test it. National codes and standards require that consumers test all battery-powered smoke alarms at least once per month^{ix}. This requirement can be found on manufacturers' websites, in user manuals, and in other consumer information.

NEMA is the association of electrical equipment manufacturers, founded in 1926 and headquartered in Rosslyn, Virginia. Its member companies manufacture a diverse set of products including power transmission and distribution equipment, lighting systems, factory automation and control systems, and medical diagnostic imaging systems. Total U.S. shipments for electroindustry products exceed \$100 billion annually. We serve as a resource, working with the state and local jurisdictions in the interest of life safety.

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¹ www.nfpa.org/research/reports-and-statistics/fires-by-property-type/residential/home-fires

² U.S. Census Bureau

³ NFPA, "Smoke Alarms in U.S Home Fires" (2012), Figure 1, p. 1

⁴ www.usfa.fema.gov/downloads/pdf/statistics/Residential_Structure_and_Building_Fires.pdf, 15

⁵ Smoke Detector Operability Survey (1992), Summary, p. ii, and Figure 2, p. .

⁶ Including but not limited to: OR, CA, MD, OH, Phoenix, Indianapolis and New York City

⁷ Thomas, Ian and Dorothy Bruck, "Smoke Alarms in Dwellings: Occupant Safety Through Timely Activation and Effective Notification," (2011)

⁸ NFPA 72, Ch. 26, Sections 23.4.2.1 and 23.16.4.2; UL 864 Commercial Fire Alarm Control Units, Chapter 56, Section 56.5.9; and UL 985 Household Fire Alarm Control Units, Chapter 64, Section 64.5.1

⁹ NFPA 72, Ch. 14, Section 14.4.5