

NEW FIRE SAFETY REQUIREMENTS FOR THE DEAF AND HARD-OF-HEARING

Emergency notification for the *deaf* and *hard-of-hearing* has long been a fire safety concern for the fire protection community. When research conducted in the early 1990's showed that high-intensity strobe lights were effective at awakening people who were *deaf*, strobes were eventually adopted into various regulatory codes as a minimum level of protection for the *deaf* and *hard-of-hearing*. However, a more recent and comprehensive study funded by the National Institutes of Health (NIH) in 2005¹ demonstrated that high-intensity strobes are ineffective at awakening the *deaf* and *hard-of-hearing*. Instead, either low frequency audible alarms, or tactile (sense of touch) devices such as a bed shaker were demonstrated as being highly effective at awakening the *deaf* and *hard of hearing*. A follow-on study² funded by the National Fire Protection Association (NFPA) Research Foundation validated the results of the previous 2005 NIH study. Based on the results of this published research, the 2010 edition of NFPA 72, National Fire Alarm and Signaling Code³ contains new fire safety requirements specifically for the *deaf* and *hard-of-hearing*.

New requirements have been incorporated into NFPA 72 (2010) for smoke alarms and household fire alarm systems provided in sleeping and guest rooms where occupants with hearing deficiencies may reside⁴. These new requirements are intended to apply to installations in **new** and **existing** locations (See Section A.29.1.2), including one- and two-family dwelling

¹ Roby, R. J., *Smoke Detector Alert for the Deaf*, Final Report, Phase II SBIR, NIH Grant No. 2R44 DC004254-2, Submitted to National Institutes of Health, (NIH), The National Institute on Deafness and Other Communication Disorders, Center for Scientific Review, Rockville, MD, May 27, 2005.

² Bruck, D. and Thomas, I., *Waking effectiveness of alarms (auditory, visual and tactile) for adults who are hard of hearing*, Report for the Fire Protection Research Foundation, National Fire Protection Association, Quincy, MA, June, 2007.

³ NFPA 72, *National Fire and Signaling Code*, 2010 edition, National Fire Protection Association, Quincy, MA.

⁴[http://www.nfpa.org/itemDetail.asp?categoryID=2076&itemID=48413&URL=SafetyInformation/Forconsumers/Populations/People with disabilities/People who are deaf or hard-of hearing/NFPA 72, National Fire Alarm and Signaling Code](http://www.nfpa.org/itemDetail.asp?categoryID=2076&itemID=48413&URL=SafetyInformation/Forconsumers/Populations/People%20with%20disabilities/People%20who%20are%20deaf%20or%20hard-of%20hearing/NFPA%2072,%20National%20Fire%20Alarm%20and%20Signaling%20Code)

units, sleeping rooms of lodges and rooming houses, individual dwelling units of apartment buildings, guest rooms, sleeping rooms, and living areas within guest suites of hotels and dormitories, day-care homes, and residential board and care facilities. The new requirements apply wherever *notification appliances* (e.g., bell, horn, speaker, light or text display as defined in Section 3.3.160) are provided for those with hearing loss (Section 29.3.7) in sleeping and guest rooms. These requirements apply regardless of whether the *notification appliances* are required by governing laws, codes, or standards, or if the *notification appliances* are provided voluntarily for those persons with hearing loss. Therefore, if *notification appliances* (e.g. strobes) are present in sleeping and guest rooms for those with hearing loss, then the installation must meet the new requirements of NFPA 72 (2010).

The specifics of the new requirements differ according to the extent of hearing loss for occupants of sleeping and guest rooms, that is, for those occupants with mild to severe hearing loss (sometimes described as *hard-of-hearing*) as defined in Section A.3.3.113 and for occupants with profound hearing loss (sometimes described as *deaf*) as defined in A.3.3.113. The new requirements for those with mild to severe hearing loss (Section 29.3.8.1) call for the use of an audible *notification appliance* that produces a 520 Hz square wave output instead of the use of visible *notification appliances* (strobes). The new requirements for those with profound hearing loss (Section 29.3.8.2) call for tactile *notification appliances* (such as a bed shaker) in addition to high intensity visible *notification appliances* (strobes). Since hearing deficits are often not apparent, the responsibility for advising the appropriate person(s) of the existence of the deficit shall be with that of the party with the hearing loss.

In addition to serving as the *standard of care* for fire alarms and signaling, NFPA 72 (2010) has been adopted into law by the State of California. The 2010 California Fire Code⁵

⁵ California Fire Code, Title 24, Part 9, International Code Council. Falls Church, Virginia, 2010.

became law effective January 1, 2011, and incorporates by reference all of the requirements of the 2010 edition of NFPA 72. Thus, as of January 1, 2011, all new and existing sleeping and guest rooms in California where visual *notification appliances* (strobes) are provided for the *deaf* and *hard-of-hearing*, whether required or voluntarily provided, must be provided with either low frequency audible *notification appliances* or tactile *notification appliances* in addition to high intensity visual *notification appliances* (strobes).

The SafeAwake product, which was developed to meet the life safety needs of the *deaf* and *hard-of-hearing* communities, is listed to the requirements of both UL Standard 217⁶ and UL Standard 1971.⁷ The SafeAwake product incorporates patented technology that listens for the activation of a standard smoke detector and, in response, provides a patented alarm through both a bed shaker and low frequency 520 Hz sounder. Thus, the SafeAwake uniquely provides both of the notification methods required by NFPA 72 and is proven through scientific research to be most effective across every demographic and hearing level--young, old, normal hearing, *hard-of-hearing*, and *deaf*--with excellent waking effectiveness for sleeping occupants. The SafeAwake product offers code compliancy with the new requirements of NFPA 72 and can be easily added to any sleeping or guest room that is currently provided with a standard smoke alarm and strobe, without the need for any new fire detection equipment or cumbersome installation (e.g., hardwiring).

For more information, contact SafeAwake, LLC at 443-539-0781 or visit us on-line at www.SafeAwake.com.

⁶ ANSI/UL 217, *Standard for Single and Multiple Station Smoke Alarms*, 2006, revised 2008, American National Standards Institute, New York, NY.

⁷ UL 1971, *Signaling Devices for the Hearing Impaired*, Underwriters Laboratories, Inc. (UL), November, 2002.