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New Carbon Monoxide Regulations Renew Emphasis on Detection

Life safety measures in homes and residential facilities got a huge boost in late 2008, as a new national standard governing the installation and usage of carbon monoxide detection devices was released. The standard's primary goal is to significantly reduce the thousands of preventable illnesses and deaths each year as a result of carbon monoxide (CO) exposure. But the new regulations surrounding CO detection also will undoubtedly spur new areas of opportunity for security and fire alarm installers and manufacturers.

Carbon monoxide poisoning, which kills more than 500 people each year and sickens 15,000, is a hidden danger in any building that uses fuel-burning appliances or other equipment. If inhaled, the odorless, colorless, invisible gas is absorbed into the bloodstream, replacing the oxygen needed by vital organs throughout the body. Exposure to CO can cause symptoms such as headaches, dizziness, and vomiting; as contact with the gas grows in length or severity, death can occur quickly.

Eliminating regulatory confusion

Although consumer awareness of carbon monoxide poisoning has increased dramatically over the past decade, it's estimated that only 15 percent of U.S. homes, and even fewer commercial properties, have CO detectors in use. By comparison, about 96 percent of U.S. homes have smoke detectors. Because NFPA 720-2009, the governing CO detection code from the National Fire Protection Association, was not available until late last year, many states and local jurisdictions developed their own regulations. These differed by state, county, or municipality, resulting



[CODES & STANDARDS]

CARBON MONOXIDE – NFPA 720

PPM CO	TIME	SYMPTOMS	DEATH AFTER
35	8 HOURS	Max allowed by OSHA in the workplace over 8 hour period	
200	2-3 HOURS	Mild headache, Fatigue, Nausea, and Dizziness	
400	1-2 HOURS	Serious Headache – Other symptoms intensify	3 HOURS (THREATENING)
800	45 MIN	Dizziness, Nausea and Convulsions (unconscious with 2 hours)	2-3 HOURS
1600	20 MIN	Headache, dizziness, and nausea	1 HOUR
3200	5-10 MIN	Headache, dizziness, and nausea	1 HOUR
6400	1-2 MIN	Headache, dizziness, and nausea	25-30 MIN

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in a piecemeal approach that caused confusion for security and fire alarm dealers operating in multiple areas.

The publication of NFPA 720-2009 has the potential to change many of the existing circumstances surrounding carbon monoxide detection. It will allow Authorities Having Jurisdiction to develop their local and state codes based on the new standard. The 2009 version expands the types of facilities, such as nursing homes, schools, hotels, and other commercial establishments, where detection is required. The previous version of NFPA 720, published in 2005, addressed only dwelling units.

Under the new rules, carbon monoxide detectors are now subject to the same life safety standards as smoke detectors in many respects, such as power supply and the detector's electrical connection to an alarm system. Some major fire alarm control panel manufacturers are beginning to offer panels with integrated CO and gas detection capabilities to ensure compliance for installers. Panels with combination fire and gas detection capabilities have the ability to send separate signals to the central station as well as to sound separate signal patterns for fire and gas. These features also satisfy the UL 9th edition of the UL864 standard, which governs all fire alarm control panels and ancillary equipment.

Specific requirements for the placement of carbon monoxide detectors are also outlined in NFPA 720-2009. In commercial applications, a detector must be mounted on or near the ceiling in the same room as a permanently installed fuel-burning appliance, as well as centrally located on every habitable level and HVAC zone in the building. For household applications, a detector should be installed outside of each separate sleeping area near the bedrooms and on every occupied level of the dwelling.

Installation on the ceiling of a room – or at least five feet from the floor – is recommended because carbon monoxide tends to rise with warm air, particularly if the source of the deadly gas is an appliance such as a leaky forced hot air furnace. This

will also ensure that the detector remains out of reach of tampering by occupants, children, and pets.

Differentiating alarm signals

To differentiate itself from other fire alarm, trouble, or supervisory signals at the panel level, a carbon monoxide alarm signal must be distinct and “descriptively annunciated.” The new combination fire panels will also enable the signals to automatically take priority over other trouble or supervisory signals. To protect against device failure, CO detectors must also send their own trouble signals, such as a sensor failure or end of life signal, to the control panel. The CO alarm and trouble signals must also be able to be displayed by central station operators monitoring the system.

Devices that notify occupants of a carbon monoxide alarm, such as a horn, must also conform to the new standard. For instance, audible alarms must now be a Temporal 4 pattern, designed to alert occupants who are often sleeping or already experiencing the sleep-like effects of carbon monoxide exposure.

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