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New Code Requirements Expand Carbon Monoxide Detection

Richard Roberts, Industry Affairs Manager, Honeywell Life Safety

Carbon monoxide (CO), often referred to as “the silent killer,” claims hundreds of lives and sickens thousands of individuals every year. It is a colorless, odorless, and poisonous gas that results from the incomplete burning of common fuels such as natural or liquefied petroleum, gas, oil, wood, or coal. When inhaled, CO enters the bloodstream and reduces the ability of the blood to carry oxygen to vital organs, such as the heart and brain.

Legislation, codes, and standards continue to evolve in an effort to reduce non-fire related deaths and injuries.

The 2012 edition of the *International Fire Code*[®] (IFC) and the *International Building Code*[®] (IBC) contain new requirements that are the result of the International Code Council membership approval of a proposal to require the installation of CO detection in new and existing Group-R and Group-I occupancies. These would include hotels, dormitories, apartment buildings, hospitals, and nursing homes.

Section 908.7 of the 2012 IFC and IBC requires CO detection to be installed in newly constructed Group-R and Group-I occupancies if the building contains a fuel-burning appliance or

has an attached garage. An open parking garage, as defined in the IBC, or an enclosed parking garage ventilated in accordance with Section 404 of the *International Mechanical Code*[®], is not deemed an attached garage.

It also stipulates that CO alarms shall be installed and maintained in accordance with NFPA 720 *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*[®] as well as the manufacturer’s instructions. Section 1103.9 of the IFC covers the requirements for existing Group-R and Group-I occupancies, equivalent to the requirements in 908.7 for newly constructed occupancies.

As with most codes and standards, there are exceptions to the mandatory CO requirements. Exceptions may apply to sleeping or dwelling units that do not contain a fuel-burning appliance or do have an attached garage, but are located in a building with a fuel-burning appliance or an attached garage.

CO detection is not required if:

- a sleeping unit or dwelling unit is located more than one story above or below any story that contains a fuel-burning appliance or an attached garage;

- a sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage;
- a building is provided with a “common area CO system,” a vague and undefined term in the I-Codes and NFPA 720¹.

Section 908.7.1 clearly permits system-connected CO detectors to be installed as a primary form of protection if they are installed and maintained in accordance with NFPA 720 and listed as complying with ANSI/UL 2075.

NFPA 720 permits either CO alarms complying with ANSI/UL 2034 *Single and Multiple Station Carbon Monoxide Alarms* or CO detectors complying with ANSI/UL 2075 *Gas and Vapor Detectors and Sensors* to be installed.

NEMA representatives championed the new CO detection requirements in the 2012 edition of NFPA 101 *Life Safety Code*[®] and NFPA 1 *Fire Code*[®]. The 2012 *Life Safety Code* was published in October 2011 and requires that CO detection be installed in accordance with NFPA 720 in newly constructed daycare occupancies, one- and two-family dwellings, lodging or rooming houses, hotels and dormitories, and apartment buildings.

CO detection is required in these occupancies when they contain a permanently installed fuel-burning appliance or when they have a “communicating attached garage,” a term that is not defined in the code or explained in the annex. The committee’s intended definition of “communicating” is a garage with a door or entryway between the garage and the dwelling unit or building.

For each occupancy, CO alarms or detectors shall be installed 1) outside of each separate sleeping area, in the immediate vicinity of the sleeping rooms; and 2) on every occupiable level, including basements, but excluding attics and crawl spaces.

NFPA 720 also requires the audible alarm notification signal to be at least 75dBA (decibels adjusted) at the pillow in sleeping areas. If the detector installed outside the sleeping area is unable to produce 75dBA at the pillow, with the door closed, a CO detector or a mini horn should be installed in the sleeping room.

For hotels, dormitories, and apartment buildings, NFPA 101 requires alarms or detectors to be installed in certain non-sleeping locations, including

- on the ceiling in rooms containing a permanently installed fuel-burning appliance and

- centrally located within occupiable spaces served by the first supply air register from a fuel-burning HVAC system.

This requirement is different from the NFPA 720 requirement for CO detectors to be installed on every occupiable level and centrally located in every HVAC zone of the building. The committee felt the 720 requirement was excessive to require all HVAC zones to have CO detection if they are not connected by duct work or ventilation shafts.

There are specific locations where CO detection is prohibited. These include garages and within dwellings, dwelling units, guest rooms, guest suites, lodging houses, or rooming houses with communicating attached garages that are open parking structures as defined by the building code or with communicating attached garages that are mechanically ventilated in accordance with the mechanical code.

Regarding NFPA 1 *Fire Code*, the Technical Committee accepted a proposal to incorporate the same NFPA 101 CO detection provisions into the 2012 edition of the *Fire Code*, thereby requiring CO detection in lodging houses, rooming houses, hotels, dormitories, apartment buildings, one- and two-family dwellings, and daycare homes that have a permanently installed fuel-burning appliance or contain a communicating attached garage. The location requirements are the same as in NFPA 101.

The total number of states with some form of CO mandate now stands at 36. NEMA actively engages state legislative and code-making bodies to procure these requirements, which primarily cover one- and two family dwellings, but in some cases extend to commercial sleeping occupancies such as hotels, dormitories, apartment buildings, hospitals, nursing homes, and assisted living facilities. With CO requirements in the model building codes, the number of states requiring the installation of CO detection devices will only increase in the next three to five years.

For details on specific state CO requirements, visit www.lifesafetysolutionsonline.com. ☎

Mr. Roberts, co-chair of NEMA 3SB Smoke/CO Group, has more than 20 years of experience in all phases of the life safety market. Other industry affiliations include several NFPA committees and the UL Standards Technical Panel for Carbon Monoxide Alarms and Gas Detectors.

¹ A change proposal currently being considered for the 2015 edition of *IFC* and *IBC* would clarify this term. The proposed text defines the term as “a CO detector to be provided in the common area between the attached garage and the dwelling units and it will activate an audible alarm at a constantly attended location.”