



Lower Valley Fire Department

Supplemental Policy Clarification Carbon Dioxide System

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Subject: Carbon Dioxide Systems and other gases used in beverage dispensing or similar applications.

Reference: 2018 International Fire Code (IFC) Chapter 53, Section 5307 and Chapter 1, Section 104.

Approved by: _____

Issue/Question:

Gaseous carbon dioxide is an asphyxiate gas and exposure to high concentrations may cause toxic effects including asphyxiation. Section 5307 of the IFC addresses compressed gases posing material hazards not otherwise regulated by the IFC. As such, the provisions of this section require ventilation when these gases are stored or used indoors. To provide for the safety of building occupants and emergency personnel, ventilation in accordance with the IFC sections, 5004.3, 5005.1.9, and 5307.2 is required where concentrations of these gases are stored or present.

Discussion:

As a result of increases in the storage and use of carbon dioxide in new facilities and at existing location where beverage dispensing or other applications are conducted, the installation of new and retrofit ventilation can be difficult. Additionally, provision of the International Energy Conservation Code (IECC) may conflict with the ventilation requirements in some circumstances. Given these issues, a continuous gas detection and alarm system may be considered as an appropriate modification as allowed under IFC Section 104.8. This modification, if approved, allows detection and notification of a hazardous condition, which can be mitigated or referred to emergency responses services.

Definitions:

Small Insulated Carbon Dioxide Systems used in beverage dispensing or other similar applications: An assembly of equipment consisting of one or more insulated carbon dioxide containers, interconnecting piping, pressure regulators, and pressure relief devices. The capacity of individual container(s) is 100 pounds (874 cubic feet (scf) to 1,000 pounds (8,741 scf) of carbon dioxide.

An existing facility is one that has a system which meets the definition described and installed prior to the effective date of this Supplemental Policy Clarification, July 22, 2016.

Decision:

For new, remodel and existing facilities, carbon dioxide systems with more than 100 pounds of carbon dioxide shall comply with the following policy clarification:

Where carbon dioxide storage tanks, cylinders, piping and equipment are located indoors, room or areas containing carbon dioxide storage tanks, cylinders, piping and fittings, and other areas where a leak of carbon dioxide can collect shall be provided with either ventilation or an emergency alarm system.

Mechanical Ventilation: Shall be in accordance with International Mechanical Code and shall comply with all of the following:

1. Mechanical ventilation in the room or area shall be at a rate of not less than 1 cubic foot per minute per square foot.
2. Exhaust shall be taken from a point within 12 inches of the floor.
3. The ventilation system shall be designed to operate at a negative pressure in relation to the surrounding area.

Emergency Alarm System: An emergency alarm system shall comply with all of the following

1. Listed by an approved testing laboratory or organization.
2. Continuous gas detection shall be provided to monitor areas where carbon dioxide can accumulate.
3. The threshold for activation of an alarm shall not exceed the Permissible Exposure Level (PEL) or 5,000 parts per million (ppm) (carbon dioxide).
4. Activation of the emergency alarm system shall initiate a local alarm, both audible and visual notification within the area in which the system is installed.
5. The continuous gas detection and alarm system shall be installed in accordance with the manufacturer's requirements and recommendations. Electrical connection shall be permanent and compliant with the NEC. Carbon dioxide is 1.5 times heavier than air, vapors accumulate in low elevations, and in non-ventilated rooms not necessarily limited to the location of the container. The detector(s) should be located in areas where carbon dioxide from a leak will concentrate. Most manufacturers gas detection sensors are recommended to be installed 12 inches to 24 inches above floor level.
6. Documentation shall be available to the fire official. The document or letter shall verify installation per the manufacture, the device(s) has been tested, calibrated, and the threshold concentration setting and operating condition.

Carbon dioxide suppression systems are excluded from the provisions of this policy and are regulated by the IFC and other applicable codes, regulations, standards, and ordinances.