SAFETY ALERT

Potential of Carbonated Beverage Systems to Create a Life Threating Atmosphere
Issued January, 2014

The Division of Fire Safety has received reports of injuries and deaths caused by Carbon Dioxide (Co2) poisoning as a result of leaking carbonated beverage systems. While we are not aware of any deaths we are aware of incidents that have occurred in New Jersey. Because gaseous Co2 is 1.5 times heavier than air, leaking Co2 can accumulate at floor level in improperly ventilated or unventilated rooms not necessarily limited to the cylinder’s location and in low areas, such as basements.

Co2 makes up approximately 0.0397% of the atmospheric air that we breathe and should not be confused with the toxic gas Carbon Monoxide (CO). At normal levels, Co2 is non-toxic and is safe to be added to beverages to carbonate them. It is possible however, to suffer anoxia or asphyxiation from breathing higher levels of Co2 because increased levels of Co2 may be related to decreased concentration of oxygen. It should be understood that increased levels of Co2 need not be accompanied by reduced oxygen levels to create a toxic atmosphere.

As the concentration of Co2 increases, people start to experience Carbon Dioxide intoxication, which may progress to Carbon Dioxide poisoning and sometimes death. Elevated blood and tissue levels of Co2 are termed hypercapnia and hypercarbia.

SYMPTOMS OF CARBON DIOXIDE INTOXICATION AND POISONING INCLUDE:

- Deeper breathing;
- Twitching of muscles;
- Increased blood pressure;
- Headache;
- Increased pulse rate;
- Loss of judgment;
- Labored breathing;
- Unconsciousness (occurs in under a minute when Co2 concentration rises about 10%);
- Death.

Fire and EMS personnel should be aware and particularly cautious when responding to incidents that may involve elevated levels of Co2 and treat them as they would Carbon Monoxide (CO) incidents by utilizing appropriate PPE including respiratory protection. Suspicion of Co2 poisoning rather than CO poisoning should be raised in occupancies where Co2 systems are present. It is also important to note that many of the gas metering devices used by fire departments do not measure Co2 levels. Responders should not depend on measuring the oxygen content of the air because Co2 can be dangerous even when adequate oxygen levels are present.

While not required by the NJ Uniform Fire Code, fire inspectors should suggest that Co2 detectors be installed in occupancies where Co2 systems are present. Fire prevention personnel should make fire suppression forces aware of locations that have Co2 systems.

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