

## Chapter 13-3

### Standard Operating Guideline for Carbon Monoxide Responses

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#### 1. Purpose

This SOG details how PVFD will handle responses to carbon monoxide detector alarm soundings or leaks of carbon monoxide (CO).

#### 2. Scope

This SOG applies to all PVFD personnel.

#### 3. Background

CO is an odorless, colorless, tasteless gas that is produced by incomplete combustion. CO is slightly lighter than air, and is combustible at very high concentrations. CO is a chemical asphyxiant. This means that CO will chemically react with the hemoglobin in the human bloodstream, preventing the proper intake of oxygen. CO exposure at low concentrations for short time periods will not cause harm. However, the human body cleanses itself of CO very slowly. Therefore, low level exposures that last a long time or high doses in a short time period will cause CO to accumulate in the body. This leads to CO poisoning. The length of time necessary to show signs of CO poisoning decreases as the concentration of the exposure increases.

CO is measured in parts per million (ppm). The following exposure levels are taken from NIOSH guidelines, and will be used to guide PVFD's response to CO:

Up to 35 PPM : Exposure for 8 hours at a time without ill effect.

200 PPM : The maximum level of exposure for any length of time.

1200 PPM : IDLH level, exposure at this concentration will produce an immediate life threatening situation

The symptoms of CO poisoning are as follows:

##### Low Level Poisoning

- Flu-like symptoms
- Mild headache
- Mild nausea
- Shortness of breath

##### Moderate to High Poisoning

- Light Headedness
- Headache
- Nausea
- Dizziness

##### Extreme Poisoning

- Vomiting
- Unconsciousness
- Cardiac Arrest

#### 4. Alarm Sounding - no reported illness

If PVFD is dispatched to a report of a CO alarm sounding, with no reported illness, the response shall be considered non-emergency. One or more command units, along with 8433 and 8431 will respond code 1. 8432 will be staffed, but will remain in quarters until requested. 8433 and 31's crews do not need to don SCBA.

The first unit to arrive will interview the occupants to determine that everyone is out of the building, and no one is experiencing symptoms of CO poisoning. When 8433 arrives, they shall set up the combustible gas indicator (meter) and zero it in fresh air. The crew shall then take the meter to the door of the occupancy and take a reading. If the reading is less than 35 PPM, the crew should then enter the structure and check each area within it, using the meter. If the reading is 35 PPM or greater, the crew should use SCBA while doing this investigation. Potential sources of CO should then be sought out and checked. LG&E should be requested to respond if there is any reading greater than zero and the source is not obvious.

#### 5. CO leak or CO alarm with occupants reported to be sick

If PVFD is dispatched to a CO leak or CO alarm with occupants feeling ill, the response shall be considered an emergency. At least 2 command officers will respond directly to the scene. Fire apparatus will respond in the following order: 8433, 8431, 8432. Firefighters shall don SCBA and be prepared to use them if needed.

The first unit to arrive will interview the occupants to determine that everyone is out of the building, and what symptoms the occupants are exhibiting. If occupant(s) are exhibiting symptoms of CO poisoning, oxygen shall be administered at 15 lpm via non-rebreather mask. OCD should be contacted to confirm that EMS has been notified, and a patient size-up shall be given to them.

When 8433 arrives, they shall use their meter to check the structure for the source of the problem, and to verify that the structure is vacated. LG&E should be requested to respond if there is any reading greater than zero and the source is not obvious. If the CO level in the structure goes above 35 PPM, personnel should breathe from their SCBA.

After initial readings have been taken throughout the structure, ventilate the structure using electric fans. Begin investigating for the CO source. If the CO level is greater than 100 PPM, initial ventilation can be done with PPV fans, then finished with electric fans.

## **6. Investigating for the CO source**

When checking for the source of CO in a structure, you must first rule out nuisance sources such as a vehicle running in the garage, smoke in the air from open burning, or an unvented space heater. Fuel burning appliances should then be checked to make sure their vents are drafting properly. It may be necessary to operate the appliances one at a time to determine if they are working properly. On furnaces, if the vent is drafting properly, check the air coming from a register. If the CO level rises at the register when the furnace is running, the furnace probably has a cracked heat exchanger.

## **7. Notification to the occupant of what was found**

When PVFD's inspection of the structure is complete, the results should be told to the occupant. The occupant should then take action based on the results as follows:

*0 reading by our meter:* PVFD did not find evidence of a problem, check the batteries, or replace the detector if necessary, as it may be defective. Call us back if anyone experiences symptoms of CO poisoning.

*10 ppm or less:* A minor problem exists. Consult LG&E to have them verify our reading and check further for the source of the problem. If the source is obvious, contact the appropriate Service Company (plumber, HVAC). Stay out of the structure if possible. If not, only occupy the structure with the windows open. Do not spend the night in the structure until the problem is remedied.

*11 to 35 ppm:* A significant problem exists. Consult LG&E to have them verify our reading and check further for the source of the problem. If the source is obvious, contact the appropriate Service Company (plumber, HVAC). Do not occupy the structure for greater than a few minutes at a time until the problem is remedied.

*Greater than 35 ppm:* A serious problem exists. Consult LG&E to have them verify our reading and check further for the source of the problem. If the source is obvious, contact the appropriate Service Company (plumber, HVAC). Do not occupy the structure at all until the problem is remedied.