

**Concord Fire Department  
Standard Operating Guidelines  
Carbon Monoxide**

### **13. Carbon Monoxide**

#### **KEY ACRONYMS**

- CO – carbon monoxide
- CO<sub>2</sub> – carbon dioxide
- ppm – parts per million
- SCBA – Self-Contained Breathing Apparatus

#### **PURPOSE**

To establish a policy and procedure for responding to carbon monoxide (CO) detector activation, CO incidents in residences, events where victims are present with CO symptoms in the absence of an alarm, and related CO events.

#### **POLICY**

The intent of this policy is to guide CFD personnel with:

- Rescue/removal of individuals from hazards
- Evacuation assistance
- Rendering medical care (if required)
- Advising occupants of findings

#### **PROCEDURES:**

Carbon monoxide (CO) is an extremely hazardous product. CFD personnel are responsible only for investigating reported carbon monoxide problems or detector activations, evacuation, rendering first aid, and advising occupants. Emergency responders are not on scene to fix/correct the cause of the problem. Occupants should be advised to contact certified repair services.

#### **CO Incident Response**

1. All responses to/from the station/scene will be Code 1 unless advised of a threat to life.
2. An apparatus with a gas detection meter must be taken (yellow and black/located on the driver's seat left side of E-44).
3. Closest unit/apparatus respond to scene and advise.
4. All other units will stand by.

#### **Arrival/Occupants Exposed to CO**

1. Evacuate the structure of all occupants.
2. Determine if anyone is exhibiting any symptoms of CO poisoning. Symptoms may include shortness of breath, nausea, dizziness, light headedness or headaches.
3. A person with a lung and/or cardiac history are most susceptible to CO poisoning.
4. Notify EMS if symptoms are present.
5. Question occupants about the type and location of any gas burning or CO producing appliances.

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**Conducting CO Investigation**

1. An SCBA will be used by any member entering a potentially unsafe atmosphere until the gas detection meter confirms safe levels.
  - a. Any time a CO level of 50ppm is found then members must don SCBA while in the structure.
2. Gas detection meter should be used to examine all levels of the structure and all rooms.
  - a. Instructions for operating the gas detection meter can be found below and are also located at the bottom side of the gas detection meter.
  - b. Make sure to let the gas detection meter cycle through outside and well away from the structure.
  - c. Detector node should be pointed downward. CO is a heavier element.
3. Examine the ENTIRE property including garage.
  - a. Potential sources include: automobiles, motorcycles, trucks, golf carts, RV's, gasoline, propane, natural gas, diesel-fueled appliances/equipment, lawn mowers, power generators, furnaces, water heaters, clothes dryers.
4. For CO readings found in the following parts per million (ppm) range:
  - a. 0 ppm: Desired level
  - b. 9 ppm or less: Acceptable level of CO in a living space above outdoor ambient conditions. (ASHRAE)
  - c. 50 ppm: No adverse effects with 8 hours of exposure. (OSHA)
  - d. 200 ppm: Mild headache after 2-3 hours of exposure.
  - e. 400 ppm: Headache and nausea after 1-2 hours of exposure.
  - f. 800 ppm: Headache, nausea, and dizziness after 45 minutes; collapse and unconsciousness after 1 hour of exposure.
  - g. 1,000 ppm: Loss of consciousness after 1 hour of exposure.
  - h. 1,600 ppm: Headache, nausea, and dizziness after 20 minutes of exposure.
  - i. 3,200 ppm: Headache, nausea, and dizziness after 5-10 minutes; collapse and unconsciousness after 30 minutes of exposure.
  - j. 6,400 ppm: Headache and dizziness after 1-2 minutes; unconsciousness and danger of death after 10-15 minutes of exposure.
  - k. 12,800 ppm: Immediate physiological effects, unconsciousness and danger of death after 1-3 minutes of exposure.
5. Positive readings above 9ppm are found, property owner should contact local natural gas company or propane provider.
6. If the readings are elevated, gas needs to be shut off.
7. Ventilate as needed. NO gas-powered fans.
8. Readings 9ppm or less, the occupants should replace or reset the detector and be directed to call the emergency services if a subsequent alarm or symptoms appear.
9. Health effects can vary significantly based on age, sex, weight, and overall health.

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**Instructions for working the SENSIT GOLD Gas Meter**

<p>1. Install the batteries by pushing down the locking tab and sliding the handle away from the top of the instrument. When replacing handle be sure the tab is securely in place.</p> <p>2. <b>IMPORTANT: CAREFULLY OBSERVE POLARITY WHEN CHANGING BATTERIES.</b> Incorrect installation can damage an internal “factory service only” fuse.</p> <p>3. Locate button “A” – push &amp; hold until the unit powers up, then release the power button.</p> <p>4. Allow unit to go through the warm up sequence in clean air. At the end of warm up, the unit will auto zero and enter the working display. This requires from 40 up to 180 seconds.</p> <p>5. If <b>FAIL</b> is displayed for any of the sensor readings, make sure the instrument is in clean air; push and hold the “C” button until <b>AUTO ZERO</b> is displayed. If this process does not clear the fail on the display, this could indicate a problem with the instrument or sensor.</p> <p>6. Look at the display – LEL, CO, O2 and H2S readings are displayed. (An “X” appears when the particular sensor is NOT installed.</p>	<p>7. Extend the goose neck (the LEL sensor and liter cap is at the tip).</p> <p>8. Place your finger over the inlet and wait ~5 seconds for “FLOW BLOCKED” to appear on the display. Change cap and “O” rings if it does not show “FLOW BLOCKED”.</p> <p>9. You are now ready to use the instrument. You can now enter the area and detect gases.</p> <p>10. Once the environment is determined to be safe to work in, if the source of an odor needs to be located, the thumb wheel can be rotated to be heard at a comfortable tick rate. Once an investigation is begun, as the instrument is moved closer to a combustible source, the tick rate will increase. The thumb wheel can then be rotated back to the comfortable rate and the investigation continued until the source is located.</p> <p>11. Press and hold the “C” button to zero the instrument. (only in a gas free area).</p> <p>12. When your investigation is complete, roll the thumb wheel back down and click it to the off position, push button “A” and hold for 5 seconds until the instrument displays “POWER OFF” then release to shut off.</p>
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