

**Protocol for Response to Carbon Monoxide (CO) Detector Activation  
March 3, 2016**

**INTENT:**

The Intent of this protocol is to ensure a safe, uniform approach in responding to the activation of a carbon monoxide (CO) detector activation.

**BACKGROUND:**

In compliance with the Uniform Fire Prevention and Building Code, the University at Albany has installed carbon monoxide detectors in areas that have devices, appliances or systems that may emit carbon monoxide (CO). The carbon monoxide detectors have a local audible alarm. Some of the detection units are stand-alone units and some of them ring into the Power Plant panel as supervisory alarms.

Carbon monoxide or CO is an odorless, colorless, tasteless gas produced from incomplete combustion. The gas is slightly less dense than air. Carbon monoxide can cause illness and even death at high enough levels. The most common symptoms of CO poisoning are “flu-like”, including headache, dizziness, weakness, upset stomach, vomiting, chest pain and confusion.

Fortunately, carbon monoxide’s health effects at various levels are well known. CO levels are measured in the air in parts per million or ppm. Below is a table summarizing the health effects associated with exposure to various levels of carbon monoxide.

<b>Level of CO</b>	<b>Health Effects, and Other Information</b>
0 PPM	Normal, fresh air.
9 PPM	Maximum recommended indoor CO level (ASHRAE).
10-24 PPM	Possible health effects with long-term exposure.
25 PPM	Maximum Time-Weighted Average (TWA) exposure for 8 hour work-day (ACGIH).
50 PPM	Maximum Permissible Exposure Level (PEL) Time Weighted Average (TWA) exposure for 8 hour work-day (OSHA).
100 PPM	Slight headache after 1-2 hours.
200 PPM	OSHA Ceiling Level (5-minute sample) Dizziness, nausea, fatigue, headache after 2-3 hours of exposure.

400 PPM	Headache and nausea after 1-2 hours of exposure. Life threatening in 3 hours.
800 PPM	Headache, nausea, and dizziness after 45 minutes; collapse and unconsciousness after 1 hour of exposure. Death within 2-3 hours.
1000 PPM	Loss of consciousness after 1 hour of exposure.
1200 PPM	NIOSH Instantaneous or Immediately Dangerous to Life and Health (IDLH)
1600 PPM	Headache, nausea, and dizziness after 20 minutes of exposure. Death within 1-2 hours.
3200 PPM	Headache, nausea, and dizziness after 5-10 minutes; collapse and unconsciousness after 30 minutes of exposure. Death within 1 hour.
6400 PPM	Death within 30 minutes.
12,800 PPM	Immediate physiological effects, unconsciousness. Death within 1-3 minutes of exposure.

### Carbon Monoxide Detection Equipment:

The University at Albany has purchased CO meters that are to be used for all activations of a CO detector and the accompanying response. The CO meters are located in both Power Plants and EH&S. The CO meters must be kept calibrated and in an accessible location, in order to have a safe, uniform response to a CO detector activation. EH&S will calibrate the CO meters every 90 days. If a CO meter appears to be malfunctioning, please bring it over to the EH&S Office in Chemistry B73, as soon as possible. The CO detectors are set to alarm at 30 PPM and the CO meters are alarmed to go off at 35 PPM.

### Response Protocol:

1. CO alarm activation comes in as a supervisory alarm on the panel or Plant gets a call that a CO alarm has been activated.
2. Plant immediately dispatches trained personnel to the site of the alarm activation. Responders take CO meter to site.
3. Before entering the area of the alarm activation, the CO meter should be turned on outside in the fresh air and then kept running when entering the area. CO meter should be continuously monitored by the responders when in the area.
4. Upon entering the area of CO alarm activation, if levels are above **30 PPM**, then all occupants of **the immediate area** should be told to evacuate, if they have not already done so.

5. **If the CO meter indicates levels at or above 100 PPM, responders should evacuate the building and call the Fire Department.** This can be accomplished by pulling the building's fire alarm. Responders should not re-enter the building, unless cleared to do so by the Fire Department.
6. If any occupant or responder complains of not feeling well upon evacuation, call 911 for medical aid.
7. If the CO levels are below 100 PPM, then responders should look for the source of the carbon monoxide. If located, the CO emitting unit should be turned off and the area ventilated with fresh air. The unit should also be locked out or tagged out until it has been serviced.
8. If responders can't find the source of the CO after a half an hour, then the Fire Department should be called.
9. Responders and occupants should stay out of the immediate area until the CO levels drop to 9 PPM or below.
10. Responders should also check other areas of the building with the CO meter to determine if CO levels are above normal. If so, these areas should also be evacuated.
11. All findings are to be reported back to the Plant and placed in the Log.
12. The unit emitting the CO can't be put back in service until it has been serviced and air level readings show that there is no CO being emitted from it.

### **Training:**

The Office of Environmental Health and Safety will provide training to Plant personnel that will be required to respond to CO alarm activation. This training will include:

- a. Carbon Monoxide (CO) and the levels at which health effects may be seen
- b. How to use the CO meter and at what levels it will alarm
- c. How to safely respond to a CO alarm activation by reviewing the CO Response Protocol

### **Equipment:**

Propane fueled or gas powered equipment is **banned** from use inside University at Albany buildings, including the Tunnels, due to their CO emissions when in use, unless specifically approved by the Director of Physical Plant and the Director of EH&S. If propane fueled equipment is used outside on University property, than it must be located away from building air intakes and entrances. If welding in an area with CO detectors, please contact the Power Plant at 442-3444 beforehand.

**If under any circumstances, responders feel uncomfortable with the situation created by the CO alarm, the Fire Department should be summoned and the building evacuated by pulling the building's fire alarm.**