

# CARBON MONOXIDE ALARMS

## A. Purpose:

This guideline is written to direct the Ponderosa Fire Department's response to carbon monoxide (CO) detector activation incidents.

## B. Overview

It should be noted that we are responding to confirm a problem, and we are not there to repair the problem. Common sense should be used with relatively minor problems. We are to advise the owner, open windows for ventilation, and if they choose to leave, assist them in exiting the structure.

## C. General

Carbon monoxide is an odorless, tasteless, colorless gas that is deadly. It is a by-product of any fuel burning process. Many appliances such as furnaces, kitchen stoves, hot water heaters, automobiles, etc. produce carbon monoxide. When a faulty device or unusual condition exists, carbon monoxide may be vented into areas where people are present.

Carbon monoxide poisoning may be difficult to diagnose. Many of its symptoms are similar to the flu, which may include headache, nausea, fatigue and dizzy spells.

The Occupational Safety and Health Administration (OSHA) has established a maximum safe working level for carbon monoxide at 35 parts per million (ppm) over an 8 hour period in the general work place. The U.S. Environmental Protection Agency (EPA) has established that residential levels are not to exceed 9 ppm over an 8-hour average.

## D. Guidelines

1. Issuance and maintenance of CO meters.
  - a. CO meters are issued to all stations
  - b. This meter shall be used to monitor the atmosphere during any suspected carbon monoxide investigation, and during the overhaul stages of a major incident.
  - c. The CO meter will be tested by the duty crew during the monthly apparatus inspections or when called for by manufacturer specifications. Should any problems be found with the meter the

person doing the inspection should follow established department guideline for broken or damaged equipment repair.

## 2. Fire Department Response

Responses will be non-emergency responses unless unless suspect of a true emergency is relayed by the dispatcher.

- a. Upon arrival, immediately question the building occupant(s) and ascertain their physical condition. Any redness of the lips, headache condition, or confused state of mind could be caused from CO poisoning. If the condition is suspected, remove the patient(s) to an outside area and administer oxygen as a minimum. If in doubt, request an ambulance to respond to the scene for further evaluation immediately.
- b. After removing the occupant(s) question him/her as to the type of detector and location. If there is suspicion of a CO detector sounding, a minimum of two PFD personnel with a CO meter, previously calibrated in fresh air, enter the structure and take sample readings of the atmosphere.
- c. Upon collecting readings the recon crew will return to the senior officer and report their findings.
  1. With readings of 20 ppm or less residents should be advised that prolonged exposure to the atmospheres in question is strongly discouraged.
  2. With readings of 400 ppm or higher, occupant(s) should not be allowed back into the structure in question, and be advised of the potentially life threatening levels present inside the structure.
- d. Regardless of the occupant(s) decision as to heed our warning or not, the senior officer should review the hazards of CO.

## E. False Alarms

Responses that are determined to be a false alarm will be treated in the same manner as fire detection automatic alarms that are determined to be false/system malfunction and will be billed accordingly.

## FACTS ABOUT CARBON MONOXIDE

Carbon Monoxide (CO) is a colorless and odorless toxic gas that is a product of incomplete combustion. When CO is introduced to the bloodstream, through the lungs, it is accepted in the place of oxygen at a rate of 300:1 and literally suffocates its victim. Since CO is an accumulative and direct reacting toxin, it can be dangerous even at low levels over longer periods of time. The harmful effects of CO inhalation depend on the following factors:

1. Concentration of CO in the air;
2. Length of time exposed to CO gas;
3. The health, age, sex, and size of the individual being exposed.

The following chart shows the maximum allowable exposure limits and symptoms developed for CO inhalation:

CONCENTRATION OF CO IN AIR	INHALATION TIME AND TOXIC SYMPTOMS
9 ppm	The maximum allowable concentration for short term exposure in a living area according to ASHRAE.
35 ppm	The maximum allowable concentration for continuous exposure in any 8-hour period, according to federal law.
200 ppm	Maximum concentration allowable at any time according to OSHA. Slight headache, fatigue, dizziness, nausea after 2 to 3 hours.
400 ppm	Frontal headaches within 1 to 2 hours, life threatening after 3 hours. Maximum allowable limit in fluc gas according to EPA and AGA.
800 ppm	Dizziness, nausea, and convulsions within 45 minutes. Unconsciousness within 2 hours. Death within 2 to 3 hours.
1600 ppm	Headache, dizziness, and nausea within 20 minutes. Death within 1 hour.
3200 ppm	Headache, dizziness, and nausea within 5 to 10 minutes. Death within 30 minutes.
6400 ppm	Headache, dizziness, and nausea within 1 to 2 minutes. Death within 10 to 15 minutes.
12,800 ppm	Death within 1 to 3 minutes.