Model Carbon Monoxide (CO) Alarm Response Policy

This is a template policy: local jurisdictions should review and modify this policy to meet local capabilities and needs. Version of 12/05/2016.

**PURPOSE**: To provide procedures for personnel to follow for the safe investigation and mitigation of reported carbon monoxide (CO) incidents.

**SCOPE**: All personnel responding to, or operating at, carbon monoxide related incidents shall follow the procedures outlined in this standard operating policy. Authority to deviate from this policy rests solely with the incident commander, who bears full responsibility for any deviation. The fire department is responsible for confirming if a CO problem exists. The fire department is not there to repair the problem, but shall provide rescue, emergency medical care, and advice the occupant as indicated by the nature of the incident.

**GENERAL INFORMATION ON CARBON MONOXIDE**

Carbon monoxide (CO) is a colorless, tasteless, odorless, non-irritating gas that is deadly to humans and animals in concentrations higher than 35 ppm. CO has no warning properties. Carbon monoxide is produced by the incomplete combustion of any fuel that contains carbon. Common carbon based fuels include gasoline, natural gas, propane, oil, wood products, charcoal, and coal. Many devices, such as gas furnaces, gas stoves, gas water heaters, wood burning stoves, gas and wood burning fireplaces, automobiles, generators, lawnmowers, etc., produce CO. When faulty devices or unusual conditions exist, CO may be vented into areas where people are present. People may use fuel burning appliances improperly, such as running generators or barbecuing indoors, including in a garage, on a porch, or adjacent to a window/door, causing CO to enter a structure.

CO is poisonous, flammable, and has a very broad explosive range (flammable limits in air, percent by volume: lower: 12.5, upper 74). CO (molecular weight 28.01) is slightly lighter than air (molecular weight 28.9) and will evenly distribute itself throughout a room indoors.

CO poisoning may be difficult to diagnose. People exposed to CO exhibit flu-like symptoms including headache, confusion, dizziness, fatigue, shortness of breath, nausea, and vomiting. High exposure levels may cause convulsions, unconsciousness, and death.

For workplaces, the Occupational Safety and Health Administration (OSHA), has established a maximum safe working level for CO at 35 PPM over an 8 hour period in a room, building, vehicle, railcar, or any enclosed space (29 CFR 1917.24(a)).

In residences, the U.S. Environmental Protection Agency (EPA) has established that residential levels are not to exceed 9 PPM over an 8-hour average. According to the EPA, average CO levels in homes without gas stoves vary from 0.5 to 5 parts per million (ppm). CO levels near properly adjusted gas stoves are often 5 to 15 ppm, while levels near poorly adjusted stoves may be 30 ppm or higher.

Dispatchers should attempt to determine if any occupants exhibit signs of CO poisoning when the call is received. If symptoms are present, the caller should be instructed to evacuate the building immediately and wait outside for the arrival of the fire department.

**RESPONSE**

If no symptoms of illness are associated with the CO alarm, one engine equipped with a CO meter, and one medical unit, shall respond routine. If dispatch receives additional information when the units are en route that indicates a possible emergency, all units should upgrade their response to lights and siren. If, upon arrival, any person exhibits symptoms of CO exposure or poisoning, any necessary additional needed fire or EMS resources shall be requested to respond with lights and siren.

If the occupants have complaints or symptoms associated with the alarm, or there is a report of a possible CO poisoning, equipped with a CO meter, and one medical unit shall respond with lights and siren.

The Incident Commander (IC) shall request the gas company to respond to the scene anytime the fire department has shut off the gas supply to an appliance or at the meter, or as deemed necessary.

**CARBON MONOXIDE INVESTIGATIONS**

1. Upon arrival, the company officer shall give a size-up and establish incident command.
2. The Incident Commander shall contact the occupants and gather as much information as possible.
3. If anyone present displays symptoms of CO poisoning they shall be immediately evaluated and provided with medical care according to EMS system protocol. If the person refuses medical care, they shall be encouraged to seek medical treatment at a hospital. Any person refusing medical care should sign a patient refusal of care form if front of a witness.
4. The safety of personnel and the occupants shall be the first concern, however no specific personal protective equipment shall be required when the CO level is below 35 PPM.
5. Fire department personnel shall calibrate the CO meter and take first measurements outside of the building, away from vehicle exhaust fumes and other sources of CO, to establish a baseline or ambient reading.
6. No one shall enter the building until the CO level has been checked just inside the door. No one is to enter without the CO meter.
7. If the CO level is above 35 PPM, only fire department personnel, in full PPE and SCBA, shall enter or be allowed in the building. A RIT team shall be assembled to comply with the OSHA 2-in/2-out requirement for operations in an IDLH atmosphere.
8. Fire department personnel in proper PPE shall conduct a complete check of the exterior of the building.
9. Fire department personnel in proper PPE shall conduct a check of the interior of the building with the fire department CO meter. Monitor all levels of the building including the basement, first floor, second floor, and any additional floors. Document the readings at each level and in each room as appropriate.

**DEFINITIVE ACTIONS**

**CO Reading Less Than 9 PPM**

1. Inform the occupants and responsible party that the fire department CO meter did not detect any elevated CO level. Note that this does not necessarily indicate that CO was not present at the time the detector sound, but that the CO may have dissipated before the fire department arrived. It is also possible that the detector malfunctioned or is not working properly.
2. Recommend that the occupants and the responsible party check their CO detector per manufacturer recommendations. CO detectors have a lifespan of 5 to 7 years (see end-of-life section in this policy). If the detector is older than that, recommend that the occupants replace the CO detector.
3. Check the location of the CO detector. CO detectors should be mounted least 15 feet away from fuel-burning appliances. Recommend that the occupant relocate the detector if it is too close to CO producing sources.
4. Ask the occupant or responsible party to reset CO detector.
5. Inform the occupants or responsible party to call 911 right away if the detector activates again, or if they have further concerns.

**CO Reading Greater than 9 PPM**

1. Any reading above 9 PPM shall be considered above normal levels, although the outside ambient reading should be taken into account.

EXAMPLE:

If the outside reading is 7 PPM on a high pollution day, and the reading inside a house is 10 PPM, no problem is indicated. But if the outside reading is 1 PPM and the inside reading is 10 PPM, the elevated CO level indicates that a problem may exist.

1. Inform the occupants and responsible party that the detected CO level is potentially dangerous.
2. If the CO level is above 9 PPM, but below 35 PPM, all occupants shall be recommended to leave the premise.
3. If the CO level is above 35 PPM, all occupants shall be ordered to leave the building immediately. No one shall be allowed back into the building without PPE and SCBA until the CO level is below 35 PPM and the oxygen level is greater than 20%.
4. If the source of the CO can be easily identified it should be turned off, removed, or otherwise rendered harmless, if possible, and the building ventilated as necessary.
5. If the source of the CO cannot be easily identified, or is not easily rendered harmless, all natural gas or LPG shall be turned off, and the building ventilated as necessary.
6. The gas company shall be requested to respond to the scene anytime the gas is shut off, either at an appliance or at the meter.
7. Once ventilation has started, take readings every 5 minutes and document the CO levels found. Continue ventilation until the CO level is dissipated. Cease ventilation when a safe CO level is achieved.
8. Re-sample the air 5 minutes after ventilation has ceased to insure the CO level remains safe.
9. Once the building has been reduced to a safe level of CO, the premise may be occupied at the discretion of the occupants.
10. Ask the occupant or responsible party to reset CO detector.
11. Inform occupants to call 911 if the detector activates again, or if they have further concerns.
12. Inform the responsible party that the gas company is responding to further evaluate the problem, but that it shall be his/her responsibility to contact a qualified contractor to evaluate and repair faulty equipment.
13. If the property is a rental property, the name, phone number, address, and other pertinent information about the property owner shall be obtained if possible. The IC or his/her designee shall contact the property owner as soon as possible to ensure that he/she is aware of the situation.
14. Before departing the scene, the IC should inform the occupants of what the fire department found and the actions taken by the fire department. If indicated, advise them to purchase a new detector that meets the most current UL 2034 Standard. Advise them to find a qualified individual to examine and repair any suspect appliance. Advise them to call 911 immediately if the CO detector activates again, and to evacuate the building and wait for the arrival of the fire department.

**End of Life Feature**

Any CO detector manufactured after August 1, 2009 is required by ANSI/UL2034 specifications to have an end of life feature. When the CO detector reaches its “end-of-life,” the detector will begin to sound 5 chirps. The end-of-life warning chirp can be silenced temporarily by pressing the Test/Silence button. The horn will chirp, acknowledging that the end-of-life feature has been activated. After approximately 2 days, the end-of-life chirp will resume. After approximately 2-3 weeks the end-of-life warning cannot be silenced. It is important to note that a CO detector may not detect the presence of carbon monoxide when in end-of-life mode.

**Documentation of Findings**

When investigating a CO alarm, whether symptoms of illness are present or not, the fire department shall use the CO Response Checklist to assist in evaluating and assessing the occupancy for CO hazards. The CO Response Checklist shall be signed and dated by the IC, and the checklist shall be attached to the TFIRS report as a required portion of the report.

After the completion of a CO investigation, and prior to departure from the scene, the IC shall fill-out and sign a Carbon Monoxide Detector Activation Notice of Findings form. The IC shall review the findings of the investigation with the responsible party, explaining the potential related hazards, and the actions that have been taken by the fire department. The responsible party will be requested to read and sign the Carbon Monoxide Detector Activation Notice of Findings form, acknowledging his/her understanding of the findings, the potential hazards involved, and the necessary actions to fix the problem. The IC shall leave a copy of the form with the occupant. The original of the form shall be attached to the TFIRS report as a required portion of the report.

**TFIRS REPORT CODING**

Fire department personnel shall use one of the following incident type codes when completing the TFIRS incident report.

If the fire department detectors found the presence of carbon monoxide:

* **424**, Carbon monoxide incident. Excludes incidents with nothing found.

If the fire department detectors did not find the presence of carbon monoxide, and the occupant’s CO detector appears to have malfunctioned:

* **736**, Carbon monoxide detector activation due to a malfunction.

If the fire department detectors did not find the presence of carbon monoxide, and the occupant’s CO detector appears to be in working order:

* **746**, Carbon monoxide detector activation (no carbon monoxide detected). Excludes carbon monoxide detector malfunction.

**CO Response Checklist**

ADDRESS: DATE:

Are any members of the household feeling ill? YES NO

Since the Carbon Monoxide Detector activated, what have you done?

1. Shut off CO sources? YES NO

If YES, Which ones?

2. Let fresh air into the house? YES NO

If YES, how and for how long?

|  |  |  |
| --- | --- | --- |
| **POTENTIAL CO SOURCE** | **LOCATION** | **METER READING** |
| Chimney |  |  |
| Fireplace |  |  |
| Cooking stove/oven |  |  |
| Furnace (natural gas/LP/fuel oil, etc.) |  |  |
| Wood burning stove |  |  |
| Portable LP gas/kerosene heater |  |  |
| Barbecue Grill |  |  |
| Gas clothes dryer |  |  |
| Gas water heater |  |  |
| Vehicle(s) in garage |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

MAKE, MODEL, and SERIAL NUMBER of any appliance found to be malfunctioning.

Incident Commander: Date:

**CARBON MONOXIDE DETECTOR ACTIVATION**

**NOTICE OF FINDINGS**

Carbon Monoxide is an odorless, tasteless, colorless gas that is deadly to humans and animals. It is a by-product of a fuel burning process. It can cause symptoms that can mimic the flu to unconsciousness and even death. Many appliances around the home are capable of producing carbon monoxide when a fault or unusual condition exists. Since the source may be transient in nature, the source may not always be detectable.

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Fire Department responded to your building at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a.m./p.m.

The highest level of carbon monoxide detected was at this location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The highest level of carbon monoxide detected was \_\_\_\_\_\_\_\_\_\_ ppm (parts per million). What does this reading mean?

**Less than 30 ppm**. Our instrument did not detect dangerous elevated levels at this time. Check your carbon monoxide detector per the manufacturer’s recommendations. Call the manufacturer for additional information (the telephone number may be on the back of the detector). If the detector activates again, call 911 immediately and vacate the building.

**30 ppm or greater**. We detected a potentially lethal level of carbon monoxide in your home. Your home is not safe to occupy until repairs have been made. We recommend that you have a qualified contractor locate and repair the source of the carbon monoxide immediately. We recommend that you purchase a new carbon monoxide detector, one which meets the most recent UL 2034 Standard. We have shut off your natural gas service and do not recommend that it be turned back on without the advice of the gas company. We recommend that you contact your gas company and obtain a list of qualified contractors and have one check all of your gas equipment.

During our investigation we found:

The following actions were taken:

Comments:

Issued By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Received by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_