

Operating Guideline # 808

Carbon Monoxide Alarm Response

March 14, 2024



PURPOSE:

The purpose of this Operating Guideline (OG) is to establish guidelines for the response to Carbon Monoxide (CO) alarm activations.

ISSUE/RATIONALE:

Carbon Monoxide is an odourless, colourless, highly flammable gas and is very deadly in relatively low concentrations. Carbon monoxide is a leading cause of poisoning deaths in the home (approximately 500 deaths per annum), unconsciousness can be immediate with a danger of death occurring in minutes if an individual is not rescued. Carbon monoxide is generally produced by the incomplete combustion of organic or carbon based materials. Appliances such as furnaces, barbeques and water heaters that operate on natural gas or other combustible fuels generate carbon monoxide as do vehicles, generators and other fuel fired motors and engines. Improperly vented wood stoves and fireplaces can also be sources of carbon monoxide. Fire personnel can be exposed to carbon monoxide in many situations such as an odour investigation or activation of a carbon monoxide detector.

GUIDELINE:

1. Upon receipt of a Carbon Monoxide alarm, Dispatch will attempt to determine the severity of the situation by using the guidelines for dispatchers Appendix I. If the occupants are complaining of flu-like symptoms (including headache, nausea, dizziness or fatigue) an ambulance must be notified to respond.
2. MLFD personnel arriving at the incident by private vehicle must not enter the structure for any reason without wearing full protective equipment including SCBA. They should encourage all occupants to evacuate if they hear the CO alarm sounding.
3. Personnel arriving at the station in response to the alarm shall turn on the MSA Altair 4X multi-gas detector that will be utilised during the incident prior to responding. This ensures that the monitor is charged and will be warmed up prior to arrival. (SEE OG 312 – Multi Gas Portable Gas Monitor).
4. Firefighters should be aware of common CO sources may include; automobiles; motorcycles; trucks; golf carts; RV's; gasoline, propane or diesel fueled appliances; lawn mowers; power generators; furnaces; water heaters; clothes dryers; natural gas or propane refrigerators; ranges; ovens; space heaters; fireplaces; wood or coal stoves; charcoal or gas grills; kerosene heaters; wood stoves; and any other equipment that burns fuel.
5. Upon arrival at the incident, personnel will attempt to determine if symptoms of CO poisoning are present in any of the occupants. Symptoms such as headache, nausea, dizziness, confusion, shortness of breath, chest pains, and shock similar symptoms. The first priority will be to ensure the safety of the occupants and this will extend to proximate neighbours in multi-unit dwellings (i.e. – apartments, condominiums etc.).

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6. If any of the residents show any signs or symptoms of medical distress, medical attention will be rendered and an ambulance shall be requested to attend if not already dispatched.

7. Regardless of whether symptoms are present or not present, all personnel shall be prepared to wear full protective equipment including SCBA and bring a calibrated gas monitor. Take a reading with the monitor outside in the fresh air before walking up to the building. This is your baseline and should be zero CO, zero H₂S, zero LEL and 20.9% O₂. If the monitor is not reading zero for H₂S, CO and LEL, attempt a "fresh air" and call for another monitor to come to the scene. Car 1 and Car 2 have 2 monitors each.

8. Using your CO monitor and following the manufacturer's instructions, firefighters should take a reading of CO outside the entry door approx 1 meter. Ensure that you are not downwind of any exhaust from vehicles or other heating appliances. Use and care training for our MSA Altair 4X monitors can be viewed [here](#). Remember any auditory alarm must be addressed by pressing a button, if the alarm can not be silenced firefighters shall exit the environment.

9. If the reading on the Alair 4X is in excess of 30 ppm CO, your SCBA should be donned before entry. This should be announced on the radio for logging. If any reading exceeds 30 ppm CO your SCBA should be donned immediately.

10. Department personnel will attempt to confirm the existence of CO in the structure and identify the source by taking measurements following the CO Measurement Form Appendix II and the Sources of CO Diagram Appendix III. All air samples should be taken in the middle of the room, making sure that you are away from any heating appliances.

11. During the investigation process, residents should be involved unless there are higher than 30 ppm concentrations, if the readings are over 30 ppm residents should always be evacuated from the home. After the investigation is completed and the forms are filled in, it is time to assess the information and provide advice to the occupants.

12. Based upon your readings use the guidelines below and advice, for situations not addressed below, please call the on-duty Chief.

70 ppm or Higher Levels of CO:

1) If the source is a vehicle or an appliance, such as a lawn mower or generator, in a garage, then:

- a) Turn off the engine and ensure that it is off.
- b) If you suspect that an appliance or a generator or a vehicle engine is the cause, advise the resident that engines should not be left on in enclosed spaces even with the door open.

2) If the source is a permanently installed appliance such as a furnace or HVAC or water tank, then:

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- a) Turn off the appliance.
- b) Shut off the fuel supply, contact the fuel supplier to "red tag" the appliance. You must contact the propane company and the TSSA at 1800 268 6060. Advise residents that they can not use the appliance until the cause of the elevated CO has been identified and corrected by a qualified technician. Ensure you log the TSSA occurrence reporting number on your call sheet.
- 3) If the source of the CO levels appears to be a portable appliance, then:
 - a) Turn off the appliance.
 - b) Advise the residents that dangerous levels of CO have been detected and the appliance must be inspected and repaired before being used again.
 - c) Advise residents that if the appliance passes inspection, but the CO problem recurs, then a qualified contractor should investigate the appliance while it is being operated in the home. This may help identify why elevated CO levels are in the home and what is causing elevated CO levels.
- 4) If you believe that an external vehicle, appliance, BBQ, patio heater or grill is too close to the home that caused the elevated CO levels, then:
 - a) Educate the resident about the proper setbacks of appliances to openings or fresh air intakes.
- 5) If you cannot find the source of the CO, then have the resident call their heating company to service their heating appliances. This needs to be communicated to the Fire Chief or designate as soon as possible.
- 6) Advise residents that they can not return to the home until levels can be brought down below 30 ppm. Use PPV fans to ventilate the home and open all doors and windows. If our equipment shows levels below 30 ppm and the homeowners CO alarm is still sounding, advise them to remove the alarm and have it replaced. It is advisable to notify the on duty Car to have another smoke/CO alarm installed.
- 7) Advise residents to have their fuel-burning appliances and chimneys inspected annually by qualified professionals.
- 8) Advise residents to use a CO alarm manufacture stamped CSA, UL or IAS.
- 9) Advise residents to call again if their alarm sounds, particularly if they have followed the above recommendations.

30 ppm and 70 ppm Levels of CO:

- 1) If the source is a vehicle or an appliance, such as a lawn mower or generator, in a garage, then:
 - a) Turn off the engine and ensure that it is off.
 - b) If you suspect that an appliance or a generator or a vehicle engine is the cause, advise the resident that engines should not be left on in enclosed spaces even with the door open.
- 2) If the source is a permanently installed appliance such as a furnace or HVAC or water tank, or a portable appliance then:
 - a) Turn off the appliance.

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- b) Shut off the fuel supply, contact the fuel supplier to “red tag” the appliance. Advise residents that they can not use the appliance until the cause of the elevated CO has been identified and corrected by a qualified technician.
- 3) If you believe that an external vehicle, appliance, BBQ, patio heater or grill is too close to intakes or proximate to the home that caused the elevated CO levels, then:
 - a) Educate the resident about the proper setbacks of appliances to openings or fresh air intakes.
- 4) If you cannot find the source of the CO, then have the resident call their heating company to service their heating appliances. This needs to be communicated to the Fire Chief or designate as soon as possible.
- 5) Advise residents that they can not return to the home until levels can be brought down below 30 ppm. Use PPV fans to ventilate the home and open all doors and windows. If our equipment shows levels below 30 ppm and the homeowners CO alarm is still sounding, advise them to remove the alarm and have it replaced. It is advisable to notify the on duty Car to have another smoke/CO alarm installed.
- 6) Advise residents to have their fuel-burning appliances and chimneys inspected annually by qualified professionals.
- 7) Advise residents to use a CO alarm manufacture stamped CSA, UL or IAS.
- 8) Advise residents to call again if their alarm sounds, particularly if they have followed the above recommendations.

Less than 30 ppm CO Levels:

- 1) Advise residents that you did not find high levels of CO.
- 2) If the call was the result of a CO alarm sounding, advise the resident to review the manufactures instructions about the CO alarm. If the alarm is over 7 years old, advise the residents that CO alarms have a limited life and that the alarm may need to be replaced. Ensure that they understand that they should never ignore a sounding alarm and that any residence must have CO alarm that has a fireplace, a connected garage or uses any fuel burning appliance. The alarms should be installed outside all sleeping areas.

13. Where a gas-fired appliance is found or suspected to be malfunctioning, the I/C shall also notify the TSSA (SEE ALSO OG 823 – Post Incident Notification of Other Agencies)

RESPONSIBILITY:

It is the responsibility of all members to comply with the provisions of this OG and particularly that Company Officers (supervisors) and firefighters (workers) ensure that they adhere to their duties in accordance with the provisions of this document.

REFERENCES:

- Occupational Health and Safety Act (RSO 1990, c. 0.1)
- MLFD OG 312 – Multigas Monitor
- MLFD OG 823 – Post Incident Notification of Other Agencies
- [Guidelines for Fire Response - US Consumer Product Safety Commission](#)

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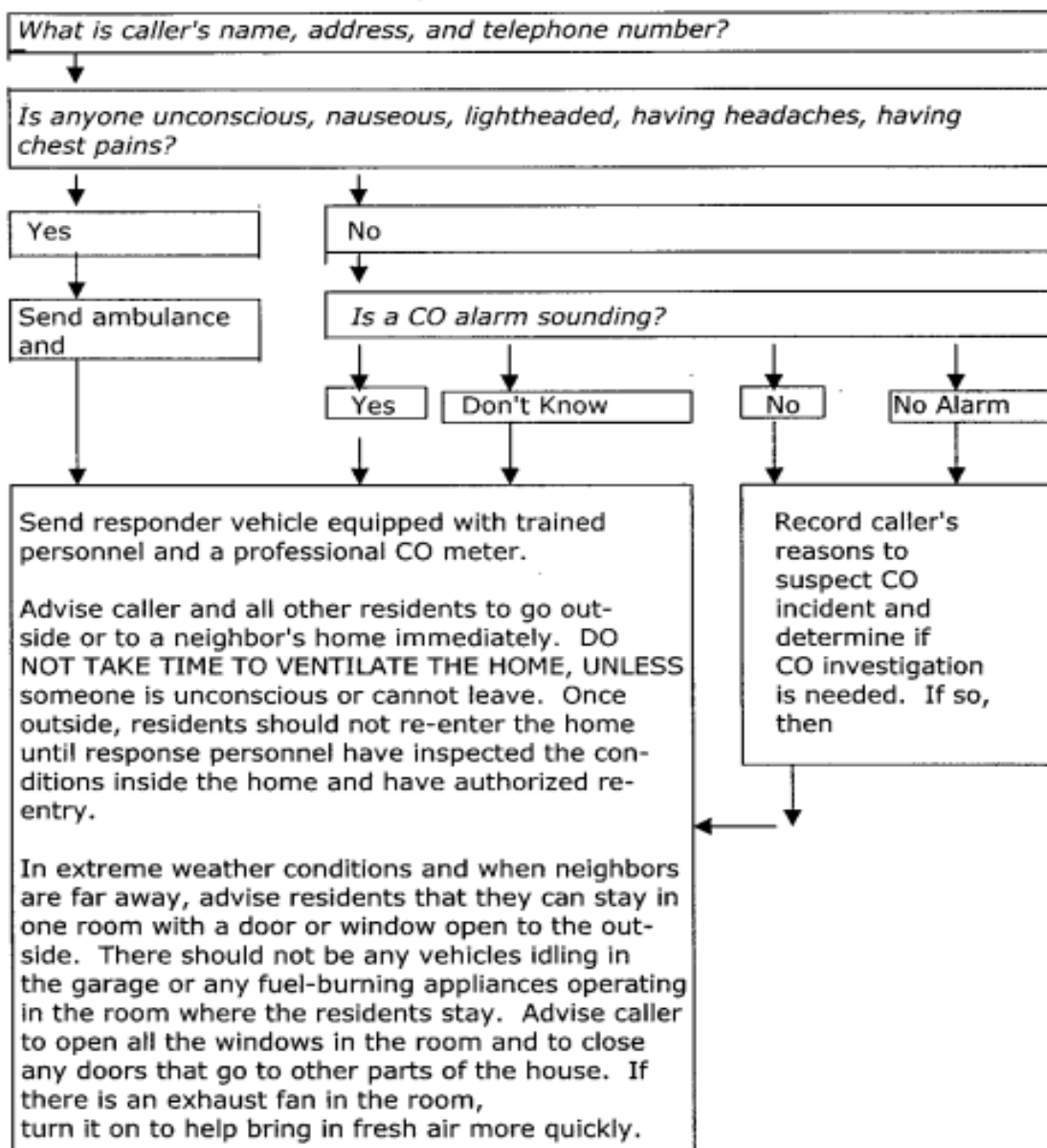
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Appendix I

CO INCIDENTS: GUIDELINES FOR DISPATCHERS

Dispatchers are the first contact when residents call for help about a CO incident. You can use these guidelines to decide what kind of help is needed and what type of equipment should be sent to the residence.



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Appendix II

CO MEASUREMENT FORM

Record levels of CO found throughout the home. Take measurements in the center of each room under the conditions specified in the *CO Incident Reporting Form*.

Draw diagram of house (on the next page) showing locations of rooms and possible sources of CO.

Measurements (CO ppm)

Outdoors (baseline)

Entrance (doorway)

Measurements (ppm) with Recently Used Potential CO Sources Turned On and Doors and Windows Closed

Attached Garage

Basement

Utility Room

Recreation Room

Den

Living Room

Dining Room

Kitchen

Family Room

Powder Room

Bedroom 1

Bedroom 2

Bedroom 3

Bedroom 4

Bedroom 5

Bathroom 1

Bathroom 2

Bathroom 3

Bathroom 4

Other Rooms

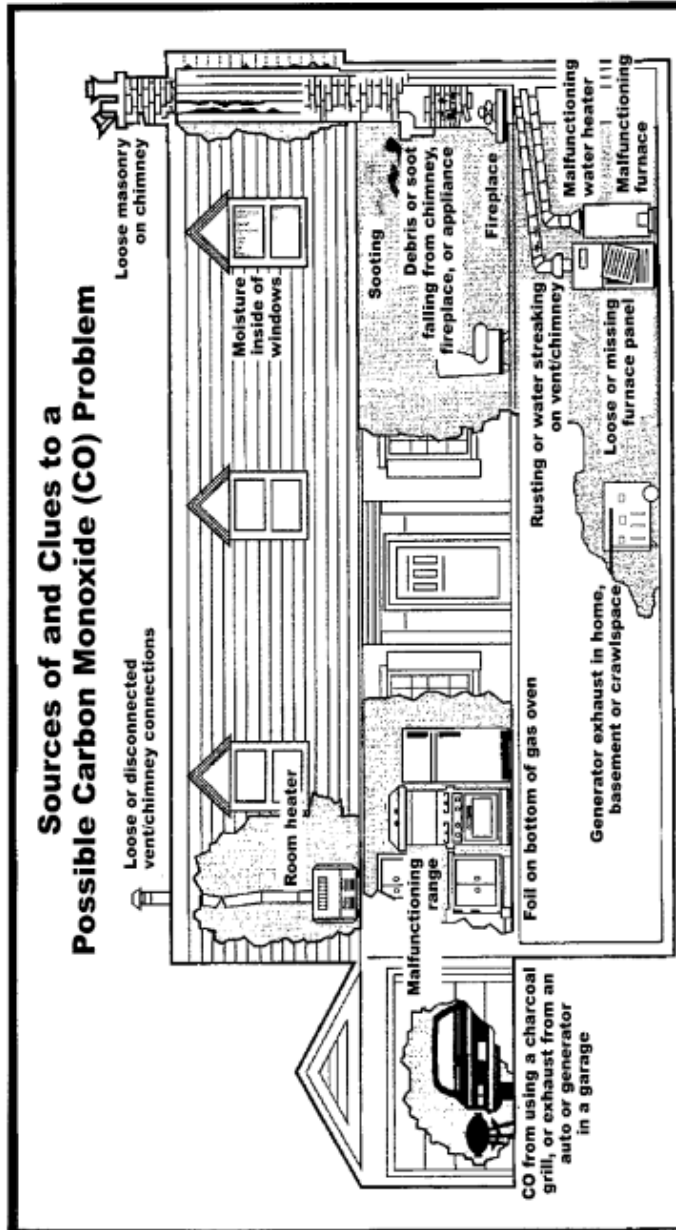
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Appendix III



Carbon monoxide clues you can see...

- ▶ Rusting or water streaking on vent/chimney
- ▶ Loose or missing furnace panel
- ▶ Sooting
- ▶ Debris or soot falling from chimney, fireplace, or appliances
- ▶ Loose or disconnected vent/chimney, fireplace or appliance
- ▶ Loose masonry on chimney
- ▶ Moisture inside of windows

Carbon monoxide clues you cannot see...

- Internal appliance damage or malfunctioning components
- Improper burner adjustments
- Hidden blockage or damage in chimneys
- Only a trained service technician can detect hidden problems and correct these conditions!
- CO poisoning symptoms have been experienced when you are home, but they lessen or disappear when you are away from home.

Warnings...

- Never leave a car running in a garage even with the garage door open.
- Never run a generator in the home, garage, or crawlspace. Opening doors and windows or using fans will NOT prevent CO build-up in the home. When running a generator outdoors, keep it away from open windows and doors.
- Never burn charcoal in homes, tents, vehicles, or garages.
- Never install or service combustion appliances without proper knowledge, skills, and tools.
- Never use a gas range, oven, or dryer for heating.
- Never put foil on bottom of a gas oven because it interferes with combustion.
- Never operate an unvented gas-burning appliance in a closed room or in a room in which you are sleeping.