North Kingstown Fire Department

Standard Operating Guidelines		5000 Series
Effective Date:	Carbon Monoxide Incidents	Special Services
05/2017		5010
Revision Date:		
05/2022		Page 1 of 6

I. Purpose

Establish a procedure for investigating reports of carbon monoxide (CO) detector activations in structures. Establish a procedure to mitigate elevated levels of carbon monoxide in structures.

II. Policy

A. The North Kingstown Fire Department shall investigate and provide a physical response for all reports of Carbon Monoxide detector activations.

III. Apparatus Response

A. Response shall at a minimum consist of:
   1. No reported signs/symptoms of CO poisoning
      i. One (1) district engine company on a Code C response
         a. If presence of CO (greater than 35 parts per million (ppm)) is confirmed by first due company; he or she shall request at a minimum the following apparatus to the scene:
            1) Ladder company
            2) Car 2
   2. Reported signs/symptoms of CO poisoning
      i. One (1) district engine company, one (1) ladder company, one (1) rescue company, and Car 2 on a normal response

IV. Personal Protective Equipment

A. If department metering devices indicate CO presence greater than 35 ppm, full PPE shall be worn including self-contained breathing apparatus (SCBA) and facemask shall be donned. The atmosphere should be considered IDLH and all activities in the IDLH shall be conducted on air. (NIOSH)
B. When operating in IDLH atmosphere, any additional company(s) may act as the “2 out” at the IC’s discretion.

V. Operations

A. Attend to any persons reported to be ill
   1. Evaluate symptoms
   2. Provide medical care consistent with RI EMS Prehospital-Care Protocols

B. Evacuate all occupants from the structure where detector is in alarm until the area can be monitored with a CO meter and is deemed safe.
C. Meet with the caller to determine the particulars of the alarm activation. Do not enter until a CO meter is on site and operating properly (consistent with manufacturer's specifications and department policy).
    1. Follow all manufacturer and department requirements for placing meters in operation.
        i. This may include, but is not limited too; allowing meters to self-test outside the structure in clean air before entering, ensuring the meter is calibrated, etc.
D. Monitoring should be done with a minimum of 2 meters.
E. Continue to monitor the air as you enter the structure and as you travel within the building.
    1. In the event the meter alarms (greater than 35 PPM) immediately retreat from the building to the outside and don your SCBA face mask.
        i. Once on air, continue the evaluation within the structure.
F. Use the CO incident checklist to help identify areas of the building that need investigation.
G. In the event of elevated CO readings:
    1. If the source can be definitively attributable to a particular appliance or fixture; secure the electrical power source and fuel supply to the appliance or fixture
        i. If the appliance or fixture is fueled by *natural gas* - notify National Grid Gas and request a response.
        ii. If the appliance or fixture is fueled by propane - consider securing the propane at the source (tank.)
    2. In the event the fuel source cannot be secured at the appliance or fixture:
        i. The IC must consider securing natural gas and/or propane to the entire building.
            a) The IC shall make special consideration when the outside temperatures are or could drop below freezing.
    3. Ventilate the structure by opening windows and doors.
        i. Utilize fans if positive pressure ventilation indicated.
    4. Doors and windows can be secured after CO levels return to normal parameters (below alarm level).
    5. Re-evaluate air quality following ventilation.
    6. Record all findings on the NKFD CO Incident Checklist form
    7. Advise the occupant / homeowner to have the appliance or fixture serviced by a qualified technician and make any other relevant notifications
    8. Refer to the manufacturer's recommendation regarding the serviceability of the activated CO alarm or detector (expiration date, working condition, etc.)
        i. Recommend occupant / homeowner to reset or replace detector based upon the manufacturer's specifications
    9. Advise the occupant / homeowner not to re-occupy the building until needed repairs are performed and the atmosphere is deemed safe by a licensed professional.

10. In the case of a tenant/landlord relationship—or if the building owner is not on scene—every effort shall be made to notify the building owner as to the findings.
    i. If the building owner cannot be notified, this fact should be noted in the narrative portion of the fire officer's report.

VI. Post Incident Operations

A. Close and secure the structure as necessary to preserve the property
B. Obtain all required information for the report which may include but is not limited to:
    a. Occupant name and contact information
    b. Owner's name and contact information
C. Provide and complete the "Notice of Findings" form for the occupant / homeowner.
D. Complete and provide copies of "Notice of Findings" and "Carbon Monoxide Incident Checklist" to the Shift Commander's office.
    a. Completed "Notice of Findings" and "CO Incident Checklist" to be maintained pursuant to department policy.
E. Confirmed CO incident with signs and sympoms of CO poisoning / exposure:
    a. Complete all required information above and in addition
    b. Complete appropriate NFIRS documentation (fire casualty if necessary.)
    c. Follow RI Pre-Hospital Protocol standard of care.

Dispatch: SOG #9001 – Dispatch - Reported Carbon Monoxide Incidents

Appendix

Signs and symptoms of carbon monoxide poisoning include: throbbing headache, nausea, shortness of breath, irritability, confusion, loss of judgment, increased heart and respiratory rate, lethargy and stupor, seizures, and changes in skin color from pale to cyanotic to cherry red. The PEL for CO is 35 ppm and the IDLH is 1200 ppm.

EFFECTS OF CARBON MONOXIDE EXPOSURE	
CO Level in ppm*	**Resulting Condition/Effect on Humans**
0-20 ppm	Grade "D" breathing air (legal for compressed or airline breathing air)
35 ppm	Permissible Exposure Limit (PEL)
100 ppm	Headache and discomfort after 3 hours
200 ppm	Ceiling level - 5 minutes allowable exposure in 4 hours - Headache in 2-3 hours
400 ppm	Frontal headache and nausea in 1-2 hours - Occipital headache in 2.5-3.5 hours
800 ppm	Headache, dizziness, nausea in 45 mins. Collapse & possible death in 2 hours
1,200 ppm	IDLH level
1,600 ppm	Headache, dizziness, nausea in 20 mins. Collapse & possible death in 1.5 - 2 hours
3,200 ppm	Headache & dizziness in 5-10 mins. - Unconsciousness & death in 30 mins.
6,400 ppm	Headache & dizziness in 1-2 mins. - Unconsciousness & death in 10-15 mins.
12,800 ppm	Immediate unconsciousness - Death in 1-3 mins.

*ppm—parts per million

All values are approximate. The effects can vary depending on the individual's health and the type of physical activity being performed.

North Kingstown Fire Department
Carbon Monoxide Incident Checklist

Location of incident_____ Incident Number_____

Questions to ask occupants:

Are any members of the household feeling ill?

Headache	Yes____No____	Fatigue	Yes____No____
Nausea	Yes____No____	Dizziness	Yes____No____
Shortness of Breath	Yes____No____	Confusion	Yes____No____
Other_____			Yes____No____

A "Yes" response to any of the above requires EMS evaluation.

Do you feel better when away from the house? Yes___ No___

What appliances were on at the time of detector activation? _____

_____

What appliances were in use for the last 24 hours?_____

_____

Gas Detection Meter Checklist

Time of Measurement_____ hours

Area of	Room Location	P.P.M. Reading	Area of	Room Location	P.P.M. Reading
Outside			Dryer		
Entering			Garage		
Space Htr.			Furnace		
Water Htr.			Chimney		
Fireplace			Stove/Oven		
BBQ grill			Gas Refrig		
CO Detector					

CO Detector information Make _____ Model_____ Serial# _____

Name of meter operator_____

North Kingstown Fire Department
Notice of Findings

Carbon Monoxide is an odorless, tasteless, colorless gas that is DEADLY. It is a by-product of a fuel burning process. It can cause symptoms that can mimic flu, unconsciousness and even death. Many appliances around the home are capable of producing Carbon Monoxide when a faulty or unusual condition exists. **Since the source may be transient in nature, the source may not always be detectable.** Carbon monoxide affects individuals differently depending on the size, age, and medical history of the occupant(s). Therefore, families with young children or members with medical conditions, or aged individuals, should take extra precautions in the event carbon monoxide is detected.

The North Kingstown Fire Department responded to investigate a possible Carbon Monoxide

problem at _____ on _____
Location Date and Time

Carbon Monoxide ( ) was ( ) was not found by our instruments. This does not mean that this was a false alarm.

Our instruments found the highest interior level of CO to be _____ P.P.M. (Parts Per Million)

WHAT DOES THIS MEAN?

9 P.P.M. Or less	**Our instruments did not detect elevated levels <u>at this time.</u> However, this does not mean that higher levels did not exist prior to our arrival nor that higher levels will not accumulate after our departure.** Check your carbon monoxide detector per the manufacturer's recommendations. Replace or reset detector as directed by the manufacturer's specifications.
More than 9 P.P.M.	**Our instruments have detected potentially dangerous levels of carbon monoxide.** We recommend that you leave this building immediately. We feel that it is unsafe to re-occupy this building until repairs are made by a licensed contractor and your detector is replaced or reset according to manufacturer's specifications.
35 P.P.M.	Maximum allowable concentration for continuous exposure in any 8 hour period according to OSHA Law.
100 P.P.M. Or greater	**We have detected a potentially lethal level of carbon monoxide in your building.** Leave your building immediately! It is not safe until repairs are made or the source is found and corrected. Have your sources of carbon monoxide examined and if necessary Repaired by a qualified repair technician. Replace or reset your detector According to the manufacturer's specifications.

You are advised to:

A. Have your source of carbon monoxide repaired by a licensed contractor.
B. If a contractor can not be reached, immediately shut off the potential source of carbon monoxide and / or potential sources.
C. If the source of carbon monoxide falls under the building codes, the contractor should notify the proper building official for a reinspection prior to reoccupying the building.

Issued by _____

Received by _____ Date_____

original : Owner / Occupant
copy: Fire Dept. Incident report