ANN ARBOR FIRE DEPARTMENT

Standard Operating Procedure - 3.18 Carbon Monoxide Incident

Effective:	September 17, 2021
Scheduled Review:	September 17, 2024
Approved:	Fire Chief Mike Kennedy

I. PURPOSE

Carbon monoxide (CO) is a colorless, odorless, and tasteless gas with no warning properties. CO is generated environmentally in combustion processes due to incomplete oxidation of carbon and carbonaceous fuels. Common sources of CO indoors are: fuel-powered vehicles such as fork lift trucks, poorly ventilated or malfunctioning heating furnaces, fuel-powered equipment, and welding.

II. PERMISSIBLE EXPOSURE LIMITS

A. Occupational / Workplace Settings - Michigan Department of Licensing and Regulatory Affairs, Michigan Occupational Safety and Health Administration General Industry PART 301. Air Contaminants for General Industry
   i. 35 ppm as 8-hour, time weighted average
   ii. 200 ppm as ceiling
   iii. No short-term exposure limit established

B. Residential Settings - American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., ANSI/ASHRAE Standard 62-2001, "Ventilation for Acceptable Indoor Air Quality."
   i. 9 ppm as the maximum indoor CO level in a residential setting

III. RESPONSE

The type of response shall be determined by the dispatch information.

A. Normal traffic: CO alarm going off in the building without complaints of occupants being sick or asymptomatic of CO poisoning.

B. Emergency traffic: CO alarm going off in the building with complaints of occupants being sick or symptomatic of CO poisoning. HVA shall also be dispatched on all suspected CO poisonings. All HVA advanced life support ambulances have monitors which can monitor carboxyhemoglobin. Tower 1-1 has a RAD 57-C Pulse CO Oximeter (Carboxyhemoglobin Monitoring) which can be requested to respond for multiple patients or a delayed HVA response. There is a second RAD 57-C unit on Haz Mat 13-1 at Station 6.

The 4-gas monitor shall be activated on arrival and in fresh air before entering the building. A reading shall be taken inside the front door. If the reading is below 200 ppm, SCBA is not required. If at any point levels are above 200 ppm, then crews must evacuate and don full personal protective equipment with SCBA.

IV. INVESTIGATION

A. Initiate a search of the premises to determine if there are any amounts of CO above 35 ppm (occupational) / 9 ppm (residential).

B. During the investigation process, occupants should be evacuated.

C. Readings less than 35 ppm / 9 ppm.
   i. Advise the occupants that high levels of CO were not found.

ii. If the incident was the result of a sounding CO alarm, attempt to reset the CO detector by bringing it into fresh air for at least fifteen minutes. If the CO detector cannot be reset, advise the occupant to purchase a new CO alarm. (CO alarms and smoke detector alarms should be replaced every ten years).
iii. Advise the occupant to call 911 if the CO alarm re-activates.
iv. Contact battalion chief to initiate SOP 4.08 Building Dept Notification.

D. Readings of 35 ppm / 9 ppm or more.
i. The occupant shall be informed that the air monitor has detected a potentially harmful level of CO.
ii. If the CO source appears to be a vehicle or an appliance.
iii. Turn off the engine, if it is still on.
iv. If it is suspected that an appliance, generator, or a vehicle engine that was idling in a garage several hours earlier is the cause of elevated CO levels, then advise the occupant that engines should not be left idling in an attached garage, even with the garage door open.
v. If the source of these CO levels appears to be a permanently installed or portable appliance.
1. Turn off the appliance.
2. If the fuel supply can be shut off, do so.
vi. Advise the occupant that dangerous levels of CO have been detected and the appliance must be inspected, repaired, or replaced qualified contractor or service person before being used again.
vii. If misuse is the cause of CO, e.g., using a charcoal grill, gas oven to heat a home during a power outage, then educate the occupant about the causes and dangers of CO and the proper use of appliances.
viii. Once CO has been reduced to a safe level via ventilation, the premises may be occupied.
ix. Attempt to reset the CO detector by bringing it into fresh air for at least fifteen minutes. If the CO detector cannot be reset, advise the occupant to purchase a new CO alarm. (CO alarms and smoke detector alarms should be replaced every ten years).
x. Advise the occupant to call 911 if the CO alarm re-activates.

E. Contact battalion chief to initiate SOP 4.08 Building Dept Notification.The company officer shall document on the NFIRS report, the CO alarm manufacturer make, model, and number of the device which activated, the highest CO level recorded, and any actions initiated by fire personnel.

V. DTE ENERGY RESPONSE

The Incident Commander shall request that DTE Energy respond to the scene through Washtenaw Fire Dispatch if any of the below conditions exist:

A. Any CO level is recorded.
B. AAFD personnel shuts off a gas appliance.
C. An occupant displays signs of CO poisoning.
D. If there is any doubt as to the origin of the CO or unusual circumstances.