Carbon Monoxide (CO) Detection-Flow Chart

State Fire Marshal Division Notes

- This flow chart is designed to aid Code Officials, Architects, Design Professionals and similar in the navigation through the Minnesota State Fire Code (MSFC) Section 915.

- *Italicized* words denote clarification and are not code language.

- For MSFC Section 1103.9, this flow chart may be used for existing sleeping and dwelling units.

- Alarm: A device powered by battery or the building wiring that detects and sounds an alarm from that specific device

- Detector: A detection device which is a component of a complete system such as a building fire alarm system

Part 1: Where required when sleeping units, dwelling units or classrooms are located in occupancies that contain fuel-burning appliances (MSFC Section 915.1.1)

- New and existing construction:
  - Group I-1
  - Group I-2 (*sleeping and dwelling units*)
  - Group R

- New construction:
  - Group E classrooms (See Part 7 for more information)
  - Group I-4 (*classrooms*)

Part 2: General CO detection location requirements (MSFC Section 915.2 through 915.2.3)

- Dwelling unit: Within 10 feet of bedrooms or within bedrooms containing fuel-burning appliances.

- Sleeping unit: Within sleeping unit.
  - Exception 1: Within 10 feet of sleeping units when units do not contain fuel-burning appliances or are served by forced air fuel-burning appliances.

- Group E (*and Group I-4*) classrooms: Within each classroom and automatically transmitted to on-site staffed location.
  - Exception: Not required to be transmitted when total occupant load is 30 or less.
• In multi-family dwellings without fuel-burning appliances within the dwelling units, detection may be placed 15 to 25 feet from the central fuel-burning appliances when a centralized alarm system or other method to notify responsible parties is present at all times.

Part 3: CO alarm requirements (MSFC Section 915.4 through 915.4.4)
• Power supply: Hardwired with battery backup.
  o Exception 1: Battery only approved if no commercial power present.
  o Exception 2 (Existing): Battery only approved if CO alarms not required at time of construction.
• Listing: UL 2034.
• CO alarms: Shall only be installed in sleeping and dwelling units.
• CO detectors: Shall be installed in classrooms, interconnected into the fire alarm system (supervisory) or provided NFPA 720 CO detection system.
• Combination alarms: Combination smoke and CO alarms listed to UL 217 and UL 2034 approved.

Part 4: CO detection system requirements (MSFC Section 915.5 through 915.5.3)
• Standard: NFPA 720, CO detectors listed to UL 2034.
• Locations: As specified in MSFC Section 915.2 (Part 2 of this flow chart).
• Combination detectors: Listed to UL 268 and UL 2075.

Part 5: Alternative CO detection location requirements (MSFC Section 915.1.2 through 915.1.6)
• Sleeping unit, dwelling unit or classroom containing a fuel-burning appliance.
  o Alternative: None
• Sleeping unit, dwelling unit or classroom served by a forced air fuel-burning appliance.
  o Alternative: Single point detection approved in first room or area served by the main supply duct from the furnace and transmitted to an approved location.
• Sleeping unit, dwelling unit or classroom building containing a fuel-burning appliance.
  o Alternative 1: (Not required when) no communicating openings between the fuel-burning appliance(s) and sleeping/dwelling units or classrooms.
  o Alternative 2.1: Detector in approved location between the fuel-burning appliance(s) and sleeping/dwelling units or classrooms.
  o Alternative 2.2: Detector located on the ceiling of rooms containing the fuel-burning appliance(s).
• Sleeping unit, dwelling unit or classroom building with attached private (or public) garage.
  o **Alternative 1:** *(Not required when)* no communicating openings between garage and sleeping/dwelling units or classrooms.
  o **Alternative 2:** When sleeping/dwelling units or classrooms are more than 1-story above or below the garage.
  o **Alternative 3:** Garage attached to sleeping/dwelling units or classrooms by open-ended corridor *(breezeway)*.
  o **Alternative 4:** Detector in approved location between garage and sleeping/dwelling units or classrooms.
  o Exempt garages: Open parking garages or enclosed garages complying with Minnesota Building Code Section 406.4.

**Part 6: Maintenance (MSFC Section 915.6 through 915.6.1)**
• Enclosed garage detection: Maintained in accordance with Minnesota Mechanical Code Section 404.1, manufacturer instructions and listing.
• End-of-life: Devices that become inoperable or sound end-of-life signals shall be replaced.

**Part 7: Group E occupancies (FMCAP 20-008-I)**
• Where such conditions as outlined in MSFC 915.1.2 through 915.1.6 require the installation of CO detection in Group E occupancies and:
  1. The Group E occupancy is required or provides an NFPA 72 fire alarm system, CO detectors shall be provided in accordance with the requirements of MSFC Section 915,
  2. The Group E occupancy is not required and doesn’t provide an NFPA 72 fire alarm system, CO alarms shall be permitted when:
     o CO alarms complying with the requirements of MSFC 915.4.1 and 915.4.2 are installed in every room or area providing care or instruction
     o The required fire safety plan includes manufacturer information regarding the testing, inspection and maintenance of such CO alarms
     o The fire inspection report issued by the Authority Having Jurisdiction shall detail such requirements per MSFC 104.9