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|  | FLINT HILL FIRE DEPARTMENT  **STANDARD OPERATING GUIDELINE** |

**Guideline Number:**  403.08

**Guideline Title:** Hydrogen Cyanide Monitoring

**Adopted:** 02/12/2024

**Rescinds:** New

**Approved By: (Chief)**

1. **PURPOSE:**

To establish a guideline to protect all personnel by monitoring the atmosphere for Hydrogen Cyanide (HCN) at all incidents involving fire. This standard operating guideline should apply to all suppression personnel and is intended to limit respiratory and skin exposure to hydrogen cyanide.

1. **DISCUSSION:**

HCN is a deadly gas and biproduct of combustion present at nearly every structure fire. It is produced when materials such as insulation or synthetic materials are burned or heated. HCN has been known to be a product of combustion, but just recently has its significance been acknowledged. The symptoms closely mirror those of carbon monoxide (CO) exposure; therefore, personnel must be cognizant of its presence.

HCN is thirty-five times more dangerous than CO. Symptoms of HCN poisoning is like that of CO poisoning which include headache, nausea, fatigue and dizzy spells at low concentrations and respiratory problems, unconsciousness, and cardiac arrest at high levels. If exposure is suspected, transport to a hospital should not be delayed.

Vehicle fires also generate a high level of HCN, but because they normally occur in an open environment, the products of combustion dissipate quickly into the atmosphere. However, when smoke is present, the need for a self-contained breathing apparatus (SCBA) is vital for responder protection.

1. **GUIDELINE:**
2. Safety of responders is a top priority, therefore, SCBA and complete personal protective equipment (PPE) are required until a safe atmosphere can be determined.
3. SCBA is required on all structure fires that present a smoke condition.

1. SCBA is required on all vehicle fires until completely extinguished and all smoke

has dissipated.

1. SCBA should not be removed for any of the above fires until air monitoring has

taken place and the incident commander (IC) had confirmed the HCN readings.

1. Turnout gear will help protect personnel from absorbing HCN through the skin, which is a secondary route of exposure.
   1. Personnel should wash turnout gear, hood, and gloves using a gear extractor, following structure fires that heavily soil and saturate gear with products of combustion.
2. All structure fires should be monitored by utilizing the HCN monitor once fire control is obtained. This is generally during the overhaul stages of a fire. Company Officer’s/Acting Officers are primarily responsible for this duty. The IC should also ensure HCN monitoring is being done. Monitoring for CO is conducted concurrently with an appropriate air monitor, (refer to SOG 410.14 CO INCIDENT)
3. The following conditions *should* warrant atmosphere monitoring:
   1. When SCBA has been used during a working structure fire, ventilation is complete, and the removal of SCBA is requested.
   2. Vehicle fires that have not cooled to ambient temperature or within a structure or in a parking garage.
   3. Outdoor fires involving anything other than natural vegetation.
4. The following conditions *should not* warrant atmospheric monitoring:
   1. When the fire is contained to the cooking container where food has burned, but no damage was caused to the container.
   2. Vehicle fires in the open atmosphere that are no longer producing smoke, have cooled to ambient temperature, and have been ventilated.
   3. When a burning odor is detected and there is no smoke visible or only a light haze.
5. Personnel should practice good personal hygiene by washing hands prior to drinking and eating in rehab.
6. All personnel operating inside the structure should be decontaminated.

**Tactical Considerations**

1. HCN is lighter than air and will rise in the heated atmosphere of a structure fire. In an enclosed environment without ventilation vapors will linger.
2. The action level to operate without SCBA in an environment where HCN is present will be 5 ppm or less.
3. An HCN reading of 50 ppm is Immediately Dangerous to Life and Health (IDLH).
4. Positive pressure may be utilized to aid in ventilating a structure.