
Fireground Carcinogen Exposure Reduction

926.1 PURPOSE AND SCOPE

The purpose of this policy is to provide proactive and reasonable steps to limit KFD employee exposures to the byproducts of combustion and other carcinogens on the fireground.

926.2 REFERENCES

CDA Code 2319

Firefighter Cancer Support Network

Healthy In, Healthy Out: Best Practices for Reducing Fire Fighter Risk of Exposure to Carcinogens

NFPA 1851, Standard on the Selection, Care, and Maintenance of Proximity Ensembles for Structural Fire Fighting and Proximity Fire Fighting

NFPA 1901, Standard on Fire Automotive Apparatus

WAC 296-305, Safety Standards for Fire Fighters

WAC 296-841, Airborne Contaminants

WAC 296-842, Respirators

926.3 POLICY

It is the policy of the KFD to take proactive and reasonable steps to limit employee exposures to the byproducts of combustion and other carcinogens on the fireground.

926.4 DEFINITIONS

- (a) Carcinogen. A substance capable of causing cancer in living tissue.
- (b) Cleaning. The act of removing soils and deeply imbedded contaminants from PPE and equipment by mechanical, chemical, or thermal means; or a combination of processes.
- (c) Contamination. The process of transferring a hazardous material from its source to people, animals, the environment, or equipment, which may also act as a carrier.
- (d) Cross-contamination. The transfer of contamination from one item to another or to the environment.
- (e) Decontamination. The physical or chemical process of cleansing an object to remove contaminants such as microorganisms or hazardous materials, including chemical, radioactive substances and infectious diseases. Decontamination is sometimes abbreviated as "Decon." Also prevents the spread of contamination to other persons or equipment.
- (f) Disinfection. A procedure which inactivates virtually all recognized pathogenic microorganisms, but not necessarily all microbial forms on inanimate objects.

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- (g) Dirty. The accumulation of materials that are not considered hazardous, nor CBRN; but could degrade the performance of PPE. For example: sweat, mild odors, dust, debris, etc. (vs. contaminated).
- (h) Dry Decon. Using a brush or other device to remove debris and products of combustion from firefighters prior to going off air and removing SCBA face pieces. Dry decon should be completed before wet decon and/or during cold weather when wet decon is impractical.
- (i) Encapsulation. Physically separating contaminants by encapsulating in waterproof bag.
- (j) Gross Decontamination. The initial phase of the decontamination process during which the amount of surface contaminant is significantly reduced.
- (k) Hazard Control Zones (WAC 296-305-01005).
 - 1. Cold zone. The control zone of an incident that contains the command post and such other support functions as are deemed necessary to control the incident.
 - 2. Warm zone. The control zone outside the hot zone where personnel and equipment decontamination and hot zone support take place. The warm zone is a limited access area for members directly aiding or in support of operations in the hot zone. Significant risk of human injury (respiratory, exposures, etc.) can still exist in the warm zone.
 - 3. Hot zone. The control zone immediately surrounding the hazard area which extends far enough to prevent adverse effects to personnel outside the zone. The hot zone is presenting the greatest risk to members and will often be classified as an IDLH atmosphere.
 - 4. Exclusion zone. The control zone designated to exclude all unauthorized personnel, responders, and equipment (e.g. holes in floors, explosive devices, collapse hazards).
- (l) IDLH. Immediately Dangerous to Life and Health. Exposure to airborne contaminants that are likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.
- (m) Personal Protective Equipment (PPE). The equipment provided to shield or isolate a person from the chemical, physical, and thermal hazards that may be encountered at a hazardous materials incident. Personal protective equipment includes both personal protective clothing and respiratory protection. Adequate personal protective equipment should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing. Specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.
- (n) Structural Fire Fighting Protective Ensemble (PPE). Includes coat, pants, hood, gloves, boots, and helmet.

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- (o) Wet Decon. The use of water to remove particulates and other products of combustion from firefighters prior to going off air and removing SCBA face pieces. Wet decon should occur after dry decon.

926.5 PROCEDURE

(a) Scene Management

1. When practical, position apparatus and personnel uphill and upwind.
2. Shut down apparatus when possible at emergency scenes to reduce excess diesel exhaust. Close windows and recirculate air instead of utilizing fresh air inlets.
3. Ensure that suppression personnel engaged in direct firefighting operations are wearing full PPE and utilizing a SCBA from initial attack through overhaul.
 - (a) Depending on incident conditions, pump operators/engineers, the Incident Commander, and other personnel may have to don a SCBA as well.
4. Establish hot, warm, cold, and exclusion hazard control zones on scene per WAC 296-305-05000 (7).
5. Consideration should be given to conducting air monitoring at the Incident Command Post or other designated areas, such as the pump panel of the attack engine(s).
6. Place the Incident Command Post and other support functions upwind and in the cold zone.
7. Personnel assigned to RIC or other support functions should stage within the warm zone.
8. Personnel changing air cylinders should shall wear PPE appropriate to the hazard, such as structural firefighting gloves or EMS gloves, and N95 masks.
9. Fire investigators shall utilize the appropriate PPE while operating inside the hot zone.
10. Post-suppression activities, including an incident debrief, fire watch, and other support activities, will consider the risk of exposure to carcinogens.

(b) Overhaul Procedures

1. SCBA will be worn throughout overhaul.
2. During overhaul, officers must identify materials likely to contain asbestos and limit the breaching of such materials to that which is necessary to prevent rekindle.
3. SCBA must also be worn during activities taking place in the area previously considered the hot zone after overhaul unless the officer in charge conducts an exposure evaluation to determine or reasonably estimate whether an employee is or could be exposed to either an airborne contaminant above a permissible exposure limit (PEL) listed in WAC 296-841-20025 Table 3 or other airborne hazards, such as biological/radiological/nuclear hazards. When the officer in charge cannot determine

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or reasonably estimate employee exposure they must conclude that an atmosphere is hazardous to the employees in accordance with WAC 296-842-13005.

- (c) Gross Decontamination
 1. Establish gross decon at each designated egress from a toxic smoke environment (including car fires and dumpster fires).
 2. Designate a gross decon area within the warm zone as follows:
 - (a) The establishment of a Gross Decon Area is usually the responsibility of the attack engine pump operator/engineer.
 - (b) The area should be approximately 50 feet from the pump panel and towards the egress from the IDLH.
 - (c) Designate the area using a traffic cone at structure fires.
 - (d) Dedicate a hose line from the attack engine that is set up by the pump operator/engineer.
 - (e) Place a decon kit within the decon area for use by crews.
 - (f) Once in place, the Incident Commander should announce the establishment and location of gross decon on the primary fireground frequency. For example, "All units operating a 2nd Avenue Command, decon has been established on the Alpha side of the structure in the front yard."
 3. Firefighters exiting the building are to stay on air and not remove any PPE until brushed and/or rinsed thoroughly (dry or wet decon).
 4. Pump operators/engineers are not to perform gross decon if they are not wearing appropriate PPE, including SCBA.
 5. After gross decon, personnel should not eat or drink until they have cleaned their hands with wipes and/or soap and water.
- (d) Hood Exchange
 1. All personnel engaged in suppression, overhaul, and/or activities that expose them to products of combustion should exchange their contaminated hood for a clean hood every time they exit the IDLH.
 2. All contaminated hoods will be transported in a sealed bag or container and washed in a bunker gear washer - extractor per the manufacturer's instructions.
- (e) Demobilization - First In, First Out
 1. When practical, Incident Commanders will endeavor to release first arriving crews from the scene first - i.e. "First In, First Out" - in order to reduce the length of dermal exposure to carcinogens.
 2. Contaminated PPE will not be worn or transported in the crew cab unless encapsulated.
 - (a) When possible, contaminated PPE and equipment should be encapsulated prior to cleaning.

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3. Demobilized and contaminated crews should remain out-of-service until personnel have taken a shower and have changed clothing. However, crews will maintain situational awareness and will respond to high priority or other incidents as determined by the officer in charge and/or on-duty Battalion Chief.
 - (a) In deciding whether or not to respond, the officer in charge should conduct a risk-benefit analysis based on the condition of personnel and the nature of the emergency.
- (f) At the Fire Station
 1. Showering, changing clothes, and placing apparatus and clean PPE in-service shall be the priority upon returning to the fire station.
 2. Prior to taking a shower, contaminated tools, equipment, and PPE items should be allowed to off-gas outside of the fire station. Contaminated PPE should not be left indoors and in front of the washer - extractor.
 3. When handling contaminated equipment, personnel will wear appropriate PPE, including gloves, splash gown, and a N95 if the equipment is dry and particulates could become airborne.
 4. When PPE has come into contact, or has been exposed to contaminants on fire scene or during live fire training, gross decontamination and cleaning will be conducted per the PPE manufacturer's instructions using each station's bunker gear washer - extractor.
 5. SCBAs, tools, and other equipment will be cleaned with soap and water per the manufacturer's instructions.