



CANCER AWARENESS AND PREVENTION PROGRAM

M E M O R A N D U M

DATE:

TO:

FROM:

SUBJECT:

Issue:

SCBA removal based on CO levels during overhaul is an unsafe practice. CO levels do not correlate with levels of other airborne toxic/carcinogenic chemicals routinely encountered during the overhaul phase of Firefighting operations.

Background:

Wearing SCBA's throughout the entire overhaul process is not the norm in the Department. Currently, Firefighters are permitted to remove their SCBA's during overhaul when CO levels are less than 25ppm. According to the Department Drill Manual, chapter 23 "The level of CO will determine whether or not the fire area can be entered without SCBA" Department, this practice is fundamentally flawed.

Discussion:

In 2000, the Phoenix Fire Department (PFD) studied airborne toxic/carcinogenic chemicals during the overhaul phase at 25 structure fires (Bolstad-Johnson, et. al., 2000). Chemicals measured included: aldehydes, benzene, toluene, xylene, hydrochloric acid, poly-nuclear nuclear hydrocarbons, respirable dust and hydrogen cyanide (Bolstad-Johnson, et. al., 2000). The results showed that there is no correlation between CO levels and other toxic/carcinogenic airborne chemicals (Bolstad-Johnson, et. al., 2000). Based on this finding, it was recommended that Firefighters wear SCBA's throughout overhaul (Bolstad-Jonson, et. al., 2000). PFD Standard Operating Procedure (SOP) for SCBA use states, SCBA's shall be worn "...where invisible contaminants are suspected to be present" (Phoenix Fire Department [PFD], 1997). According to PFD Deputy Fire Chief Brian Tobin, PFD Firefighters wear SCBA's "on-air" throughout overhaul, no exceptions. PFD does not routinely monitor air quality at structure fires because the environment is assumed to be contaminated.

Chief Tobin also addressed the issue of decreased work capacity and increased fatigue as a result of 100% SCBA use. This concern is remedied by frequently rotating crews throughout various functions to

distribute the workload and by providing frequent breaks for hydration and "cooling off". During the hottest part of the year, PFD assigns an additional company to each alarm.

In 2011, the Tualatin Valley Fire & Rescue Department, a 22 station department located south of Portland conducted a similar study. Dual function Firefighter/Hazmat Technicians responded to 38 structure fires over the course of 8 months (Tualatin Valley Fire & Rescue Department [TVFRD], 2011). Results were similar to that of the PFD research, no correlation between CO and other toxic/carcinogenic airborne chemicals existed (TVFRD, 2011).

Additionally, neither cartridge respirators (APR) nor N-95 masks provide meaningful respiratory protection during overhaul. In 2000, 26 Phoenix Firefighters wearing APR's during overhaul were compared to 25 Tucson Firefighters not wearing respiratory protection during overhaul (Burgess, et. al., 2001). The results showed decreased pulmonary function and increased lung permeability in both groups, meaning APR's did not provide adequate protection (Burgess, et. al., 2001). A primary limiting factor of APR's is the fact that the contaminants must be known in order to ensure the right filter is used, a near impossibility at structure fires.

N-95's provides almost no protection during overhaul. N-95 masks are designed to filter 95% of particles 0.3 microns and larger (US Food & Drug Administration [FDA], 2015). The dilemma is that many of the toxins encountered during overhaul are far smaller, ex: tobacco smoke which contains numerous known carcinogens can be as small as .01 microns and gas molecules can be as small as .0001 microns (National Institute of Environmental Health Sciences [NIEHS], 2006).

Lastly, when considering 100% SCBA use during overhaul the *Assigned Protection Factor* (APF) should be considered. APF is a term used to rate the degree of respiratory protection provided by a particular device (Occupational Safety and Health Administration [OSHA], 2009). Essentially, the APF reflects how much safer the air you are breathing inside your respiratory protection is compared to the air outside, a safety factor of sorts.

The following are APF's for various forms of respiratory protection:

Air Purifying Respirator (APR) = APF 10

Powered Air-Purifying Respirators (PAPR) = APF 25

SCBA= **APF 10,000**

Source: OSHA, 2009.

Recommendation:

Require 100% "on-air" SCBA use for all Firefighters throughout the overhaul phase at all fires, excluding wildland fires.

Wearing an SCBA throughout overhaul will decrease the work capacity of Firefighters and increase fatigue. In order to prevent heat related illness and injury, Captains shall ensure crews are frequently rotated to cool-off and hydrate. Additionally, when possible, crews should be rotated amongst work assignments to evenly distribute workload and cumulative exposure to toxins.

Date

100% SCBA use throughout overhaul will result in greater demand being placed on Light & Air units. Because Firefighters will be spending more time "on-air," it stands to reason that Light & Air will be requested more frequently.

Alternatives:

None. SCBA's are readily available and provide the highest level of respiratory protection possible. Based on published research and the consensus of industry leaders in attendance at the recent Boston FD Health & Wellness Symposium, 100% SCBA use is recommended throughout overhaul, without exception.

CAPP Representative

INITIALS/initials

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