Background

The National Wildfire Coordinating Group (NWCG) evaluated the health hazards of smoke at wildland and prescribed fires in the United States between 1989 and 1997. Data were collected on the three primary hazards of wildfire smoke: respirable particulate matter, aldehydes (formaldehyde and acrolein) and carbon monoxide (CO). In 1997 the NWCG held a conference to review the results of the study with the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), fire management officers, scientists and researchers. The participants concluded that the incidence of exposures in excess of OSHA limits was relatively low and therefore they did not require respiratory protection for wildland firefighters. However, firefighters may use respirators if certain conditions are met.1

In 1990 the National Fire Protection Association (NFPA) also became involved in this issue, and created a committee to develop a national standard for protective clothing and equipment for wildland fire fighting. NFPA standard #1977 (2005 edition) addresses the issue of respiratory protection in the annex.

Respiratory Protection

The NFPA and the United States Department of Agriculture (USDA) Forest Service consider wildfire smoke not immediately dangerous to life or health (IDLH). The NFPA addresses the issue of respiratory protection for wildland fire fighters in NFPA Standard 1977, Protective Clothing and Equipment for Wildland Fire Fighting, 2005 Edition. Annex “A” states “No currently available air purifying respirator provides protection for all currently known hazards of wildland smoke. Due to the potential for increased carbon monoxide exposure, the wildland fire fighters’ agency should provide programs to expand training and develop and implement procedures to monitor CO exposures when fire fighters use air purifying respirators. Any respirator being considered for use by wildland fire fighters must be National Institute for Occupational Safety and Health (NIOSH) certified. Care should be exercised in the use of NIOSH-certified respirators because they have not been tested for heat resistance and flammability of the filter medium and have not been evaluated for their ability to provide protection from the products of combustion of wildfires.”

Based on the results of NWCG studies, a disposable particulate respirator with carbon to reduce nuisance gases and vapors can be considered. Another option is a half or full facepiece with a combination organic vapor/acid gas cartridge and a particulate filter. A full facepiece respirator should be considered if eye protection is a concern.

Air purifying respirators will filter many of the contaminants found in wildland fire smoke; however, they will not filter out all contaminants, such as carbon monoxide, they do not supply oxygen and they will not protect against super-heated gases. Respirators should be used in accordance with OSHA 1910.134 which requires a full respirator program to include training, medical evaluation and fit testing. In addition, for tight-fitting respirators to be effective, the user must be clean-shaven in the area where the respirator contacts the face.

For further information concerning the use of air purifying respirators in wildland fire conditions you may contact 3M at 1-800-243-4630 or contact the USDA Forest Service at (202) 205-8333.

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