Occupational health and safety:

Risks still present after extinguishment

by Michael L. Donahue

Today's fire and explosion investigators work in environments and conditions that are considerably more hazardous than those of 20 years ago.

The widespread use of synthetic building materials and furnishings has greatly increased the amounts and kinds of toxic by-products of combustion that may result in personal injury, illness or death. The safety and health of investigators is often taken for granted since most investigators assume that by the time they arrive at a fire or explosion scene, the potential hazards are either eliminated or diminished to the point they are no longer a concern.

Several studies of firefighter occupational safety and health hazards associated with overhaul operations at fire scenes have concluded that numerous toxic by-products of combustion are usually present, and several are known or suspected human carcinogens, such as acrolein, acrylonitrile, benzene and formaldehyde.

Investigators who typically begin their scene work after suppression and overhaul operations also face an increased risk of exposure to these toxic substances unless they wear proper personal protective clothing and equipment. Such equipment includes turnout gear, helmet, boots, gloves, eye protection and appropriate respiratory protection equipment, such as air purifying respirators (APRs).

Respiratory equipment prevents inhalation of toxic substances

Some toxic chemicals at fire and explosion scenes may not be detected by human senses since they may be colorless and odorless, and their toxic effects may not produce any immediate symptoms. Therefore, inhalation is of primary concern to investigators because the lungs are extremely vulnerable to physiological properties of chemical contaminants. Wearing an APR equipped with the appropriate filter cartridges can prevent the inhalation of these substances and the likelihood of exposure.

An APR equipped with a high-efficiency, particulate air (HEPA) cartridge and a combination cartridge for acid gases and formaldehyde is the most effective and most common type in use today. The safety chapter in the 2001 edition of National Fire Protection Association (NFPA) 921, *Guide for Fire and Explosion Investigations*, recommends that any investigator who enters fire scenes immediately after extinguishment wear a positive-pressure, self-contained breathing apparatus (SCBA). At "cold" scenes, an investigator should wear a filter mask equipped with the appropriate filter cartridge.

Organizations must be sensitive to compliance with applicable federal, state and local occupational safety and health regulations specific to the jurisdictions where they operate to avoid potential violations and citations. For example, the issuing and wearing of respiratory protection equipment by investigators is subject to the requirements of OSHA's *Respiratory Protection Standard* (29 CFR 1910.134).

This standard requires that organizations develop a written respiratory protection program that includes, at a minimum:

- Standard operating procedures for the selection and use of equipment
- Instruction, training and mask-fit testing requirements
- Medical evaluation and surveillance program
- Hazard evaluation and
- Periodic program evaluation.

For more information about the regulations, see OSHA's Web site at **www.osha.gov/html/respirator.html**. FF

New book addresses health, safety issues that are relevant to fire investigators

While some public and private organizations actively address the health and safety of fire and explosion investigators, many others have yet to make it an important issue — perhaps due, in part, to the lack of resources offering specific guidance to develop the necessary policies, procedures and training programs.

Michael L. Donahue, a nationally certified hazardous materials technician, has recently written the book, *Safety and Health Guidelines for Fire and Explosion Investigators*, to help fill the void. He is with the Bureau of Alcohol, Tobacco and Firearms (ATF) and is an International Association of Arson Investigators (IAAI) certified fire investigator. Donahue has 20 years experience in fire investigation, occupational health and safety and hazardous materials emergency response.

Published by Oklahoma State University's Fire Protection Publications (FPP), *Safety and Health Guidelines* is designed for fire and explosion investigators. The book includes the most current safety and health-related information based on guidelines and procedures from some of the nation's leading authorities and resources. It's scheduled to be released in January.

To order your copy, call FPP at (800) 654-4055 or visit the Web site, **www.ifsta.org**. The price is $45 per copy and includes a companion CD-ROM. FF