OCCUPATIONAL SAFETY & HEALTH PROGRAMS FOR FIRE INVESTIGATORS

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Introduction

Today's fire investigators face increasingly dangerous environments and conditions while conducting fire scene investigations due to the widespread use of building materials and furnishings manufactured from plastics, foams and polymers that may pose numerous short and long-term health hazards. These synthetic materials represent fuel loads that produce highly toxic byproducts of combustion that have the potential to cause personal injuries, illnesses, and chronic occupational diseases unless personnel use effective protective measures. The safety and health of fire investigators is often taken for granted since many incorrectly assume that by the time they arrive at a fire scene, the potential hazards are either eliminated or diminished to the point where they are no longer a concern.

Some investigators have been diagnosed with disabling and debilitating injuries and chronic illnesses such as various cancers, that surfaced days, months, and years after investigations were concluded. Some occupational physicians believe that these conditions may result directly from fire scene exposures that occur while investigators are working at fire scenes. Firefighters working in similar environments routinely wear respiratory protection equipment to prevent exposure, however most fire investigators seldom wear any respiratory protection devices even though they often enter scenes during or shortly after overhaul is completed.

The health and safety of investigators working at fire scenes is one of the most neglected areas of emphasis and training throughout the fire investigation community. The training programs, workshops and seminars sponsored by professional trade associations, educational institutions and state and local membership organizations seldom include any safety and health-related topics. The safety chapter in NFPA 921 – *Guide for Fire and Explosion Investigations* and NFPA 1033,

Standard on Professional Qualifications for Fire Investigator contain only limited information concerning the health and safety risks associated with conducting fire scene investigations. In addition, these documents do not offer any specific guidance for organizations to develop adequate standard operating procedures (SOPs) or comprehensive occupational safety and health programs for fire investigators.

Over the past decade, several studies of firefighter occupational safety and health hazards associated with fire scene overhaul operations conducted in Canada, the United Kingdom, New Zealand and the United States have documented that most fire scenes contain numerous toxic byproducts of combustion, several of which are known or suspected human carcinogens, such as *acrolein, acrylonitrile, benzene, formaldehyde,* and *vinyl chloride*. These studies also noted that exposure to these toxicological hazards may result in increased incidence of various cancers such as lung, kidney, bladder and liver cancer.

In 1998, the Phoenix (Arizona) Fire Department conducted a comprehensive air monitoring study designed to characterize firefighter exposures during overhaul operations. The study concluded that numerous concentrations of toxic air contaminants were present during fire overhaul that exceeded occupational permissible exposure limits (PELs). The researchers found that without the use of respiratory protection, firefighters were overexposed to irritants, chemical asphyxiants and carcinogens, therefore, respiratory protection is recommended during fire overhaul.[1]

The real question that has spawned debate and concern within the fire investigation community that remains to be answered is, *are investigators subject to the same increased incidence of heart disease, cancer and other serious medical conditions as firefighters due to exposure to harmful atmospheric contaminants?* Unfortunately, the answer is “no one really knows for sure” because few organizations consider it a priority and there is little or no research being funded. If we step back and focus on this issue for a moment from a “common sense” perspective, one can easily

recognize that standing or crawling around fire scenes for several years constantly being exposed to *benzene*, *formaldehyde*, *hydrogen chloride*, *hydrogen cyanide* and *acrolein* may not be the healthiest or smartest thing to do.

All public and private sector employers have a responsibility to provide a "safe" workplace and to protect their employees from recognized hazards as required under the *General Duty Clause* of the Occupational Safety and Health (OSH) Act of 1970. Most organizations are operating under the assumption that since the term 'fire investigator' is not specifically mentioned in occupational safety and health regulations that their activities are not subject to Occupational Safety and Health Administration (OSHA) scrutiny. This belief could not be farther from the truth. In fact, investigators and their employers are expected to comply with all safety and health regulations, standards and practices applicable to the tasks and activities that are conducted at their workplace, which most often will be at fire scenes.

There are few resources available that offer any specific guidance to assist organizations in developing the necessary policies, procedures, and training programs for investigators to comply with applicable federal, state, and local occupational safety and health requirements. ***The key to compliance with occupational safety and health regulations and the foundation of an organization's standard operating procedures, policies and employee training programs is a comprehensive written Occupational Safety and Health Program***. Organizations that fail to comply with applicable safety and health regulations could be subject to civil and criminal liability. The coverage of federal, state and local occupational safety and health regulations vary and is dependent upon several factors that include; whether the state in which investigators are employed is considered an "OSHA state plan state;" whether investigators are employed by federal, state or local agencies or are self-employed; and whether local safety legislation (ordinances) have been passed. A list of the OSHA state plan states and specific information concerning covered activities can be accessed at www.osha.gov/fso/osp/.

Fire Investigator Safety and Health Programs

The safety and health of fire investigators is a key issue that is slowly becoming a priority within the fire investigation community. However, many public and private organizations have failed to adequately address this issue by modifying their standard operating procedures and training / education programs. An organizational and individual commitment to safety dictates that all fire scenes be considered hazardous until proven otherwise and investigators approach them in a cautious and methodical manner.

OSHA has identified the following critical elements that are necessary to develop an effective fire investigator occupational safety and health program and have consistently proven successful in helping organizations reduce the incidence of occupational injuries, illnesses and fatalities:

1. *Management Commitment and Employee Participation*. Organizations must clearly state a policy on safe and healthful working conditions, so that all personnel with responsibilities at the scene of an incident understand the priority of safety and health protection in relation to other organizational values. A clearly articulated written safety and health policy statement is the foundation of safety and health management. In an effective program, management regards the safety and health of investigators as a fundamental value of the organization and clearly demonstrates its commitment to safety and health protection. Employee involvement provides the means through which personnel develop and/or express their own commitment to safety and health protection, for themselves and for their fellow investigators. In addition, a single individual should be appointed to be responsible for investigator safety and health-related issues to ensure it receives the attention it deserves.

2. *Hazard and Risk Assessment*. The identification of the potential hazards at a fire scene requires an active, on-going examination and analysis of work processes, practices, procedures and working conditions. Because certain hazards may be difficult to recognize, effective examination and analysis must approach the specific tasks performed and working conditions from several perspectives. The recognition of hazards helps to identify the appropriate level of personal protective clothing and equipment (PPE) required to adequately protect investigators, as well as the appropriate training and education needs. ***Identification at a fire scene of those safety and health hazards that pose safety and or health risks to employees is the general duty of the employer under the Occupational Safety and Health Act of 1970***. Successful organizations will actively seek the benefit of the experience of others in their field, through trade associations, equipment manufacturers and other information sources.

3. *Hazard Prevention and Control*. These are triggered by a determination that a potential hazard always exists. Hazards are prevented by the implementation of standard operating procedures (SOPs) and work practices that outline effective engineering controls, work practices, PPE or the

specific tasks to be performed in conjunction with appropriate employee training. Where it is not feasible to eliminate them, hazards must be managed and controlled to prevent potential injuries or exposures. ***Once a hazard or potential hazard is identified, it must be eliminated or controlled in a timely manner prior to personnel entering the area***. Established procedures to detect and correct all potential safety and/or health hazards must be prepared prior to personnel participating in potentially hazardous activities and operations at the scene of an incident and to keep the workplace "hazard free."

4. *Safety and Health Training and Education.* An effective training and education program addresses the safety and health responsibilities of all personnel. It is not necessary that elaborate or formal training programs solely related to safety and health be developed. Integrating safety and health training and education into all organizational activities is the key to its effectiveness. Safety and health information and instruction are most effective when incorporated into other training concerning job performance requirements and tasks on a regular basis. Education and training in safety and health protection is especially critical for employees who assume new duties. This fact is reflected by the disproportionately high injury rates among employees newly assigned to job tasks. Although some of these injuries may be attributable to other causes, a substantial number are directly related to an inadequate knowledge of job hazards, safe work practices and a lack of training/education.

5. *Long-Term Commitment*. Management and employees must make a serious commitment to sustain the organization's safety and health program and make it a key priority that is always the foundation of the culture and mission of the organization. Without this level of commitment, the safety and health program is doomed for failure. Organizations should reach out and continually look for new and improved practices, methods and programs specifically tailored to the duties and responsibilities of investigators. Organizations must keep their safety and health programs up-to-date and incorporate new technologies, procedures or equipment where appropriate.

Summary

An effective *Fire Investigator Occupational Safety and Health Program* includes provisions for the systematic identification, evaluation, and prevention or control of general workplace hazards and less obvious hazards that may arise during on-site activities. Although compliance with specific federal, state and local OSHA regulations is an important objective, an effective safety and health program goes beyond specific legal requirements to address all foreseeable employee safety and health hazards. It seeks to prevent injuries, illnesses, exposures and fatalities whether or not compliance is at issue. ***The extent to which the program is described in writing is less important than how effective it is in practice***. However, as the scope and magnitude of an incident (*or the complexity of a hazardous operation increases*), the need for written guidance increases to ensure clear communication of safety policies, procedures, priorities and responsibilities. This process is essential to maintain the highest possible level of safety and

health for all personnel working at fire scenes and to help organizations comply with all applicable federal, state and local OSHA regulations.

NOTE: Additional health-related information on the hazards and short and long-term health effects associated with firefighting can be obtained at http://toxnet.nlm.nih.gov. Information on investigator safety and health-related topics can be found in a new book available from Fire Protection Publications (FPP) / International Fire Service Training Association (IFSTA) titled, ***Safety and Health Guidelines for Fire and Explosion Investigators***. Copies may be obtained by contacting FPP/IFSTA at 1-800-654-4055 or via the web at www.ifsta.org

ENDNOTES

1. Bolstad-Johnson, Dawn M., et. al, *Characterization of Firefighter Exposures During Fire Overhaul*, Phoenix Fire Department / University of Arizona Prevention Center / Arizona State University, 1998.