



## **IAFF DIVISION OF OCCUPATIONAL HEALTH, SAFETY AND MEDICINE**

### **Position on the U.S. Army Soldier & Biological Chemical Command's (SBCCOM), Withdrawn "3/30 Rule" and the New Guide: *The Risk Assessment of Using Firefighter Protective Ensemble with Self-Contained Breathing Apparatus for Rescue Operations During a Terrorist Chemical Agent Incident***

The International Association of Fire Fighters has expressed serious concerns over the *Guidelines for Incident Commanders Use of Firefighter Protective Ensemble (FFPE) with Self-Contained Breathing Apparatus (SCBA) for Rescue Incidents During a Terrorist Chemical Agent Incident* (which was commonly known as the "3/30 Rule"). In short, it is the position of the International Association of Fire Fighters that the "3/30 Rule" and its subsequent modifications are inappropriate and unacceptable as the basis of a protective strategy for use by fire fighters and other first responders.

Development of the "3/30 Rule" first began in February 1998 and was released by the U.S. Army Soldier & Biological Chemical Command (SBCCOM) in August 1999. Our concerns then were based on the following:

- The chemical warfare agent exposures utilized for the recommendations were based on military battlefield conditions, not the urban environment in which this Nation's fire fighters will respond. Since the report's release, threat assessments predict that the concentrations of terrorist chemical warfare agents would be significantly higher, in part due to their potential use in enclosed structures.
- In a recent Oak Ridge National Laboratory memorandum issued on January 21, 2003, entitled *Evaluation of Percutaneous Vapor Toxicity for Certain Chemical Warfare Agent: Application to Selection Guidelines for Protective Ensembles*, more comprehensive and better defined skin toxicity levels are identified than those that were available in 1998 when the "3/30 Rule" was developed. Most significant, as the memorandum addresses, military percutaneous vapor toxicity estimates are not appropriate for assessment of fire fighter protective ensembles for two reasons. First, the severe effects evaluated are set for levels that allow injuries (unfit for duty) to the protected and exposed individual. Second, the evaluated threshold levels are based on a lethal dose representing

only 50% of the population and therefore assume that some effects will occur for at least half of the population in the emergency response community using the selected fire fighter protective ensemble.

- Using the information in the above memorandum, calculations show that fire fighter protective ensembles need to provide a protection factor of approximately 38 for response to chemical warfare agent incident. The structural fire fighting ensembles evaluated for the 3/30 effort have protection factors for skin protection of about 10. Accordingly, the chemical warfare agent exposure levels used to evaluate the structural ensemble following the “3/30 Rule” are not adequate and therefore, inappropriate and unacceptable for protection of fire fighters and emergency responders.
- In addition to the above concerns, the “3/30 Rule” adds additional confusion to the end user. First the five (5) sets of fire fighter structural gear that were used in the research are identified only by the textiles used in the outer shell of the garment, and do not provide a description of the other layers. The outer shells provide little, if any chemical protection, in fire fighter protective clothing owing to its porous textile structure. Such chemical warfare agent protection is provided, albeit to a minimal level in current fire fighter structural ensembles, by the moisture barrier. Additionally, there are easily over two hundred (200) different composites of the three layers – outer shell, moisture barrier and thermal liner – that are utilized in current fire fighter structural garments. The “3/30 Rule” work tested only two (2) different composites in one design.
- An additional issue expressed in the published “3/30 Rule” is that there is no way to determine the duration of protection against any exposure with fire fighter structural gear. This may cause fire department incident commanders to extend operations into exposed areas believing their fire fighters have some protection based on the time and exposure criterion established in the “3/30 Rule”, when they may actually have no protection.
- Also, during the development of the “3/30 Rule”, there were no standards available to address fire fighter response to an incident involving a chemical warfare agent. Since 2001, two national consensus standards have been published. These are NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies Ensembles with Optional Chemical/Biological Terrorism Protection* and NFPA 1994, *Standard on Protective Ensembles for Chemical/Biological Terrorism Incidents Ensembles*.
- The “3/30 Rule” was being cited and used for training in preparing fire fighters for a potential chemical warfare agent response.

The IAFF maintained that the continued use of the “3/30 Rule” placed fire fighters at risk. Therefore, we believed that the current evidence justified that SBCCOM address this issue and recall the “3/30 Rule”. Based on these serious concerns, the “3/30 Rule” was **withdrawn** in the Spring of 2003.

In June 2003, a fully revised document was issued by SBCCOM, now entitled *The Risk Assessment of Using Firefighter Protective Ensemble with Self-Contained Breathing Apparatus for Rescue Operations During a Terrorist Chemical Agent Incident*.

Fire fighters who use Fire Fighter Protective Ensembles (i.e. Turnout Gear) with SCBA to perform quick rescue under the conditions stipulated in this new document are subject to **greater risk of chemical effects** than they are if they use protective equipment fully certified under existing standards. SBCCOM recommends that certified chemical protective equipment be available for responders and, when available, responders should use certified chemical protective equipment in any operations suspected to involve chemical or biological agents.

However, when fire fighters are not aware that a chemical agent hazard exists, or when certified chemical protective equipment is not available at the emergency scene, this report gives the Incident Commander the understanding of the chemical hazards for fire fighters who find themselves in situations involving chemical agents. The report also provides information on the **significant limitations** that exist for any use of fire fighter structural protective clothing and equipment in these situations.

The IAFF has warned that information provided in this new report is based on the same limited testing under limited conditions as provided in the initial report and that it does not account for all possible hazards that first responders may face during an emergency involving a possible chemical agent. Specifically, the information in this report:

- Does not account for all type of protective clothing and equipment that might be available to first responders, including all designs, styles, materials of construction, state of wear, or conditions of use.
- Does not specifically involve the testing of materials for resistance to permeation by agents but instead exclusively relies on a form of overall garment integrity testing. The IAFF has learned that this approach is in fact a departure from the military’s own prescribed methods for qualifying protective clothing as suitable for use against chemical warfare agents by using combination of both material and overall garment integrity testing.
- Does not account for any exposure to chemical agents in liquid form, which can be substantially more hazardous than the agents in vapor or

aerosol form as used for the basis of this report. Since liquid exposure is generally considered a more severe exposure condition compared to vapor, it is expected that the measured protection of the FFPE and SCBA will be substantially reduced when liquid exposures is taken into account. SBCCOM acknowledges that first responders should avoid liquid contact, but the IAFF feels that this is an impractical suggestion as the likely response scene will be chaotic and uncharacterized making it difficult for first responders to avoid contact with liquids.

- Does not account for exposures of a continuing nature or chemical release hazards other than nerve or Mustard chemical agents.

Accordingly, the report should be used as an assessment tool to understand the severe limitations of turnout clothing and not as an operations and/or training document.

In all cases, fire departments must provide fire fighters with appropriate, certified protective ensembles defined in NFPA 1994, *Standard on Protective Ensembles for Chemical/Biological Terrorism Incidents*, and the new chemical, biological, radiological, and nuclear (CBRN) approval criteria for self-contained breathing apparatus (SCBA) developed by the National Institute for Occupational Safety and Health (NIOSH).

Further, NIOSH's criteria for testing and certifying two types of respirators for use against CBRN exposures have been incorporated by the National Fire Protection Association (NFPA) as tentative interim amendments to two NFPA standards. On July 17, 2003, the NFPA Standards Council adopted a tentative interim amendment to NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, that references NIOSH's criteria for testing and certifying self-contained breathing apparatus and full-face piece air purifying respirators for use against CBRN exposures. On January 4, 2004, the NFPA Standards Council approved a tentative interim amendment to NFPA 1994, referencing the NIOSH criteria in minimum requirements for protective ensembles and ensemble elements for fire and emergency service personnel exposed to CBRN agents in responses to terrorist incidents

These changes in the NFPA standards require that fire departments provide specific CBRN protective ensembles and protective equipment when fire fighters engage in assessment, extrication, rescue, triage, treatment decontamination, and support function operations involving chemical or biological terrorism incidents. These changes further require that the incident commander employ a plan that includes an assessment of the hazard and exposure potential, respiratory protection needs, entry conditions, exit routes, and decontamination strategies, and perform a risk assessment of each incident to determine the needs of the protective ensembles and protective equipment. Based on the results of the risk assessment, the incident commander is to select either a Class

1, Class 2, or Class 3 ensemble compliant with NFPA 1994 or a vapor-protective ensemble that is certified to the optional chemical and biological terrorism protection requirements of NFPA 1991.

The International Association of Fire Fighters recommends that all fire departments regard the “3/30 Rule” and its subsequent modification with extreme caution. While the report contains some useful information on the hazards during a chemical warfare release and explains many of the significant limitations of fire fighter structural protective clothing and equipment, fire departments must strive to equip their first responders with appropriate protective clothing and equipment complying with rigorous standards. Only by following this tenet can fire departments ensure the minimum levels of health and safety of their members.

The US Army's Edgewood Chemical/Biological Center is continuing their assessment of the potential WMD hazards presented to fire fighter first responders. It is their belief that protection against all chemical hazards should be incorporated into fire fighter protective ensembles, which are available to all fire fighter first responders. Until this is achieved, it is their position that awareness and operational restrictions will remain important factors in continuing emergency response, under a recognized potential for terrorism involving chemical warfare agents. The full report can be found at [http://www.ecbc.army.mil/hld/cwirp/ffpe\\_scba\\_rescue\\_ops\\_download.htm](http://www.ecbc.army.mil/hld/cwirp/ffpe_scba_rescue_ops_download.htm).

Additionally, through the federal government's Interagency Board on Standardization and Interoperability (IAB), a standardized equipment list (SEL) has been developed to provide a standard reference document to assist the fire response community in the standardization and interoperability of fire department equipment, including PPE. In the SEL, PPE selection is based on exposure and hazard assessments. Currently, no PPE protects against all hazards. The information is organized by threats and hazard type for weapons of mass destruction (WMD) incidents, correlated to existing standards, and is based on ensembles. The SEL clearly illustrates existing standards for chemical, biological, radiological, nuclear, and explosive (CBRNE) PPE, identifies gaps in CBRNE PPE for providing protection against specific hazards, and the lack of standards for some equipment. Further detailed information on the SEL can be found on the IAB website at [www.iab.gov](http://www.iab.gov) under the INFORMATION category.

Further, in December 2003, a Homeland Security Presidential Directive (HSPD-8) was issued and now directs that all equipment, including personal protective equipment (PPE), purchased through Federal preparedness grants for first responders shall conform to equipment standards in place at time of purchase. The Directive also requires that other Federal departments and agencies that support the purchase of first responder equipment will coordinate their programs with the Department of Homeland Security and conform to the same standards. The full Directive can be found at <http://www.whitehouse.gov/news/releases/2003/12/20031217-6.html>.