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PPE Update

2 efforts to clarify firefighter PPE rules

There are new developments in PPE for Ebola-like viruses and efforts to make firefighting PPE standards more accessible

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There is an initiative within NFPA's Technical Committee on Structural and Proximity Firefighting Protective Clothing and Equipment to develop ancillary materials to help firefighters better understand standards on firefighter protective clothing.

A task group is working with selected committee and industry members, with the aid of a university, to put together straight-forward, lay-person information that describes the various tests and their purpose within the NFPA 1971 standard for turnout clothing. The hope is that the information will assist those responsible for fire department gear selection to appreciate how protective clothing is evaluated in order to better specify gear, as well as understand its limitations.

The content of any NFPA standard can be relatively intimidating. The number of details describing the various requirements applied to firefighter protective clothing and equipment are daunting. When the first edition of NFPA 1971 was released in 1975, it contained 26 pages and included five different test methods.

The most recent 2013 edition numbers 146 pages and has 74 different test methods. Needless to say, the standard has become increasingly complicated and fire departments have difficulty keeping up with all the details, particularly the nuances of different requirements and what the results mean.

Simplified listings

Many firefighters would prefer to — and often do — simply reply upon the fact that a garment is certified, leaving it to the committee, the manufacturers and the certification organizations to set meaningful design, performance, and labeling requirements, thereby establishing minimum protection.

Yet, the marketplace for this gear is full of different claims, often based on a variety of data, which tout the benefits for different products. Departments faced with trying to sift through this information can be at a disadvantage if they do not understand the standard or the different tests being used to evaluate different firefighter clothing items.

The task group is attempting to simplify the standard by listing the various tests that are addressed for each element of clothing and equipment (garments, helmets, gloves, footwear, and hoods), providing a short description for how the test is conducted, and offer explanations for the type of results produced and what they may mean.

One option being considered is to provide this information as a table included as an annex at the end of the standard. This can answer questions about what a particular test is and how it is applied to the type of clothing item evaluated.

Levels of familiarity

Some tests may be more familiar than others. For example, the flame-resistance test makes perfect sense as it is applied to each material used in the construction of turnout clothing. What might not make sense is the fact that when this test is conducted, it is actually applied to small pieces of material to individually assess each layer's flame resistance.

The quality of flame resistance is actually judged on the basis of how long the material continues to burn after the flame is extinguished, and how extensively the material is damaged. Very few tests are performed on the whole clothing item; for garments, there are actually only two tests that involve clothing as the tested sample: liquid integrity test and the DRD function test.

Many tests are not intuitive in their execution or their results and require an explanation. Commonly applied test for measuring material heat resistance involves exposure of individual clothing layer materials in an oven for an extended period of time at a temperature considered beyond survivability if firefighters were exposed to such a condition.

However, the test has been found to correlate with field observations of acceptable clothing heat degradation resistance.

The task group plans to go further and supply photographs of different test to help explain how they function. Eventually, separate documentation is planned as additional guidance for the fire service in being able to understand the different requirements and make judgments about how they should expect gear to perform in the field, as well as recognize its limitations.

Update on Ebola concerns

Last month we wrote about the problems facing the emergency services in their preparedness for potential Ebola virus disease cases. Since then there has been substantial activity within the government and other arenas to promote better guidance for fire departments and other first-responder agencies to select appropriate PPE to deal with this emerging threat.

The Centers for Disease Control upgraded its initial guidance for PPE selection in the wake of findings that health care workers may have been exposed to and contracted Ebola due to either inadequate

PPE or practices involving its use and doffing. This guidance included three new requirements.

- Repeated training and demonstrated competency for health care workers in the wearing and use of PPE.
- Selection of PPE so that no skin is exposed.
- Supervised donning and doffing of PPE.

CDC provided further details for PPE selection, donning and doffing procedures on its web site. In addition, CDC and the HHS Office of the Assistant Secretary for Preparedness and Response prepared the "Detailed Emergency Medical Services Checklist for Ebola Preparedness."

This checklist identifies basic types of personal protective equipment that fire and EMS organizations should have on hand as part of a preparedness and response program.

In this checklist, they acknowledged the Interagency Board for Equipment Standardization and Interoperability (IAB). To meet the specific needs of first response organizations, the IAB provided detailed recommendations for PPE in a document release Oct. 24.

Industry-accepted standards
Consistent with its practice, IAB attempted to define PPE in terms of meeting national consensus standards. It recognized that NFPA 1999 is properly positioned to establish both material and seam biopenetration-resistance and overall liquid integrity consistent with the threats presented by the current and potential future epidemics.

However, it noted a lack of products currently certified to NFPA 1999 and therefore recommended products on the basis of industry-accepted standard test methods in combination with design features for different clothing items.

Even with the improved PPE guidance, it is important to recognize that the appropriateness of PPE against Ebola and other similar highly infectious pathogens is also predicated on providing PPE ensembles that are properly integrated for full body protection that do not leave exposed skin.

It also essential that a specific sequence for donning and doffing PPE items be established for the selected ensemble, particularly in the aftermath of actual or suspected contamination.

We recognized that the emergency responder industry continues to struggle with this matter and will keep the fire service updated as new information becomes available.

About the author

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Jeffrey and Grace Stull are president and vice president, respectively, of International Personnel Protection, Inc. They are members of several NFPA committees on PPE as well as the ASTM International committee on protective clothing. Mr. Stull was formerly the convener for international work groups on heat/thermal protection and hazardous materials PPE as well as the lead U.S. delegate for

International Standards Organization Technical Committee 94/Subcommittees on Protective Clothing and Firefighter PPE. They participate in the Interagency Board for Equipment Standardization and Interoperability and have authored the book, "PPE Made Easy." Send questions or feedback to the Stulls via email.

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