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PPE Update

Are state, federal firefighter PPE safety rules safe?

Compared with NFPA standards for firefighter gear, federal and most state regulations are woefully behind the times

Nov 12, 2015

We often cite National Fire Protection Association standards because they are the prevailing, most up-to-date and leading standards that relate to firefighter protective clothing and equipment.

NFPA's process directly engages firefighters as part of committees and is transparent. Yet aside from a few states, such as Texas where NFPA standards are part of the local regulations, these standards are nearly always voluntary.

High levels of compliance with NFPA standards are mainly due to their widespread acceptance for several reasons.

One reason is that fire service organizations generally want to follow comprehensive specifications that were created through a legitimate process that completely defines minimum protection. The concern over liability, by both manufacturers and end users, is another reason.

For firefighter protection, regulations adopted by the Occupational Safety and Health Administration are found in the U. S. Code of Federal Regulations in [29 CFR Part 1910.156, Fire Brigades](#). These regulations, adopted in 1980, form the basis for mandatory compliance by fire departments regarding firefighter safety.

These include specific requirements for fire brigade organization, training and personal protective equipment. Training requirements are relatively simple and primarily relate to the quality of training being equivalent to fire academies that were considered the best at the time that regulations were written; they provide very little information to define the specific firefighter competencies.

OSHA on PPE

A substantial portion of the OSHA regulations pertain to personal protective equipment.

Federal firefighter PPE regulations define protection requirements for foot, leg, body, hand, head, eye, face and respiratory devices. The general requirements in each of these areas are relatively simple.

Minimum footwear includes either fully extended boots to provide protection for the legs (what were once called hip boots) or protective shoes or boots worn in combination with protective pants. The only performance requirements include water resistance extending 5 inches above the bottom of the heel, a slip-resistance outer soles and a puncture-resistant midsole.

Body protection requirements are linked to the 1975 edition of [NFPA 1971](#) with additional requirements set for testing outer shell materials for tear resistance and heat resistance. Hand protection requirements are from a 1976 National Institute for Occupational Safety and Health firefighter glove study detailing cut, puncture, and heat penetration.

Head, eyes and face protection is based on 1977 criteria developed by the National Fire Safety and Research Office (a precursor to the U. S. Fire Administration) and related regulations in [OSHA 29 CFR 1910.133](#) for general industrial eye and face protection. The regulations do qualify full face piece respirators meeting respiratory protection requirements and refer to [OSHA 29 CFR 1910.134](#) for a 30-minute rated self-contained breathing apparatus using DOT-approved cylinders.

Modernization efforts

Needless to say, these regulations are completely outdated. Certainly, all modern equipment now specified by the NFPA standards meet and exceed the federal regulations. There are current efforts to update these and other OSHA PPE regulations.

Yet, these efforts are several years in the making and will likely already be out of date when finished. Consequently, departments should not solely rely on compliance with the federal regulations as this puts the department and its firefighters at risk for not meeting contemporary levels of protection.

The Occupational Safety and Health Act of 1976 requires states at least meet the federal regulations but can have their own plans if those requirements are set at least at the same level.

This is true for California where under Title 8 of the California Code of Regulations, several sections define minimum requirements for firefighting PPE. These requirements were developed some years after the federal rules and include several differences. For example, Cal OSHA recognizes the use of personal alarm safety system devices, although they are predicated on a pre-first edition version of the NFPA 1982 standard covering PASS.

Like OSHA, Cal OSHA sets specific requirements for firefighter protection. Head protection requirements reference the 1985 edition of NFPA 1972, which at that time solely addressed structural firefighting helmets. Yet, requirements for visibility materials on helmets and ear flaps were made optional.

The California way

Eye and face protection requirements refer to the use of a heat- and flame-resistant hood, the collar of the protective coat and face shields meeting an old edition of an American National Standard Institute Z87.1 standard for industrial eye and face protection.

Ear and neck protection are to be met by wearing a helmet with ear flaps, using a flexible neck protector worn with the helmet, providing a flared shield attached to the brim of the helmet, wearing a hood or having a high coat collar and throat strap.

Body protection references the 1981 edition of NFPA 1971 but lowers the outer shell's tear resistance and further addresses the flame resistance of trim not then covered in NFPA 1971. Protective gloves must demonstrate conductive and radiant heat resistance, dexterity and grip; the regulations further require attachment wristlets.

Foot protection requirements must comply with a 1975 military specification that only addresses rubber boots. In addition, the boots must have slip-resistant outer soles, corrosion-resistant hardware, toe protection conforming to 1991 industrial footwear standards, and durable outer shell materials.

Fire service respirators are required to be positive-pressure SCBA that include an automatic warning signal that activates when the service time has been reduced to 20 to 25 percent. The regulations further permit SCBA being equipped with a buddy-breathing device or a quick disconnect even if the devices are not certified by NIOSH.

Recently, California began efforts to update these regulations. The state is considering all current editions of applicable NFPA firefighter PPE standards as part of its deliberations. An advisory committee that includes a number of firefighters intends to complete its recommendations by July 2016. This is obviously a step in the right direction.

Real risk

Although these requirements are clearly deficient compared with existing NFPA standards, sometimes we are surprised to see greater-than-deserved reliance on federal and state regulations without supplemental independent certification to the appropriate NFPA standard.

There was one case several years ago where a firefighter wore gloves that met the state standard instead of the modern NFPA standard. The gloves had no moisture barrier and significantly less insulation than would be permitted by NFPA.

Unfortunately, the firefighter suffered extensive burns to his hands after becoming trapped in a residential structure fire. It was argued that the gloves met the prevailing state standard despite other products being available that were certified to NFPA 1971.

The case became pivotal in the debate over whether glove should meet minimum state requirements that are clearly outdated versus those that meet a comprehensive and up-to-date standard that reflects the latest firefighter protection.

Such a case is not an isolated event and until government rules are either updated or interpreted as requiring departments to meet the latest requirements, such issues can occur. All departments and firefighters should consider NFPA standards beyond federal, state, or local requirements in any purchase or use decisions.

This compliance does not eliminate all risks, but it does promote a recognized level of safety that becomes the prudent minimum course of action.

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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