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PPE Update

## **Firefighter face, eye protection advances stalled**

**Attitudes, not technology, are what's holding back significant improvements to firefighter safety**

Feb 27, 2017

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One of the elements of a firefighter's protective ensemble that often gets neglected is eye and face protection. Most often firefighters rely on their self-contained breathing apparatus facemask, but SCBA are not worn for every type of emergency response.

Manufacturers must provide firefighter helmets with either a set of goggles or a faceshield, which is intended for supplemental eye and face protection. Yet, these items may not be the most effective for emergency response activities other than structural firefighting and also are easily damaged and become a source of contamination.

Perhaps, it is time to rethink how eye and face protection is provided. It's been a running debate in the fire service and one that NFPA recently looked at.

Without any doubt, the full facepiece of an SCBA is a complete and reliable form of eye and face protection. When properly worn, it protects against physical, thermal, chemical and biological hazards. Current standards dictate a high degree of protective performance including extreme thermal exposures.

The committee that writes standards for SCBA has endeavored to make the SCBA the most survivable part of the firefighter ensemble on the basis that protecting the firefighter's air supply should be of paramount importance. This philosophy transcends into similarly providing high-quality eye and face protection.

While there are certainly circumstances by which this protection can be compromised, the use of SCBA facepieces during structural fires and similar immediately dangerous to life and health environments is quite appropriate.

## **FACEPIECE LIMITATIONS**

If there are any limitations for the SCBA facepiece in terms of eye and face protection, it is that the SCBA are not always used when they should be and there are the ongoing issues of contamination control. The fire service has been steadily moving toward firefighters continuing to wear SCBA during overhaul following structural fires.

This is not always been the case because the burden for wearing SCBA remains high, particularly after the high demands of fire suppression activity. Yet, overhaul is a relatively dangerous activity where significant exposure hazards are present from both an inhalation and physical perspective.

On the other hand, any use of SCBA in a firefighting environment will result in its contamination. It is therefore critically important that the facepiece be fully cleaned to ensure that the firefighter does not continue to expose him or herself to toxic and carcinogenic fireground soils by the direct contact of the facepiece on their skin.

Firefighters wear their protective ensemble in a range of different emergency responses that are not necessarily IDLH. In many cases, severe eye and face exposure hazards are encountered and some form of protection is needed.

For the past two decades, helmets have been required to include either faceshields or goggles. Faceshields must be mounted directly on the helmet and can take a variety of configurations.

The most common form is a full faceshield that are stored above the helmet brim and then brought down when required. Another type is the flip down visor that is stored underneath the helmet brim.

If a faceshield is not provided, then goggles are an alternative. These may have some form of attachment to helmet through clips or are simply provided separately.

## **GOGGLES AND FACESHIELD SHORTCOMINGS**

There is an ongoing debate in the fire service over what is the best helmet-based eye and face protection. Some regard faceshields as the better protection; others contend that goggles provide a more protection.

Many firefighters like faceshields because they tend to stay with the helmet, are easy to use during an emergency and provide broader face protection (at least for some types). Those who choose goggles say they truly provide primary eye protection because goggles completely encompass the eye area, whereas faceshields only provide partial protection.

Less frequent are firefighters who use both types eye and face protection with their helmet depending on the circumstances faced during the response activity. Further, many firefighters carry

supplemental goggles or safety glasses.

One of the main problems with eye and face protection provided with helmets is that they are easily damaged and contaminated during a structure fire. Many firefighters complain that during any moderate fire exposure, their faceshield or goggles are thermally damaged.

Certainly by being on the exterior, these helmet components are readily contaminated by fireground soils. This means that when the eye and face protection component is needed, it will not offer adequate visibility and will create unintended exposure to contamination to a vulnerable portion of their body.

Some fire departments and firefighters attempt to get around these issues by keeping their goggles in a coat pocket or by using some device to provide protection to their goggles when worn on the helmet.

There also are helmets where the faceshield is retracted into the helmet interior when not needed. Many of these products are gaining popularity, but they still represent a minority of available protection capability.

## **THE FIX**

There are some helmets of European design with retractable face and eye protection. But these helmets do not resemble the traditional North American design and are not considered acceptable by the large majority of departments and firefighters across the country.

It is clear that current eye and face protection practices are not optimum unless the SCBA facepiece is being worn as part of the protection envelope. The reliance on helmet-based goggles or faceshields may attenuate some hazards. But unless they are kept clean and undamaged, these components do not necessarily work as intended.

Then there is the issue of prolonged contamination. This can be overcome by thorough cleaning, but there is less attention in the fire service on the cleaning of these components than there should be.

As long as parts of the fire service cling to traditional helmet designs, it will be difficult to advance alternative eye and face protection approaches. Yet, there are requirements in the occupational safety and health standards for fire service that dictate the provision of primary eye protection in any emergency event.

There was an attempt to install forward-thinking concepts for alternative eye and face protection during the last revision of **NFPA 1971**. But alas, many committee members thought that the effort was premature without fully vetted requirements for how different types eye and face protection could be demonstrated.

We believe that in our age of ensuring the lightest, least stressful and contamination-resistant protective ensemble that endeavors should be made to promote more sustainable, efficient and cleanable eye protection.

The technology is available, but changes in attitude are certainly needed to accomplish this goal.


## 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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