



**Jeffrey O. and Grace G. Stull**

PPE Update

## **Firefighter PPE cleaning rules are changing**

**NFPA 1851 is being revised, and early proposals would make it more clear how fire departments should clean contaminated PPE**

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There has been an ongoing transition in the fire service toward coming to grips with the fact that dirty clothing is no longer acceptable. At one point in the not-so-distant past, heavily soiled firefighter clothing was perceived as a badge of honor, showing the experience of the firefighter.

Such practices now show ignorance of the fact that wearing contaminated gear is only unnecessarily and chronically exposing yourself to dangerous substances, as well as transferring that contamination to those around you.

While the recognition that structural fires are contamination events is increasing throughout the fire service, practices for properly cleaning that clothing still lag far behind.



Advanced cleaning is required at least once a year, although the first edition required a minimum of two cleanings. (Photo/Joe Thomas of Greenbox Photography)

Over two decades ago, the **Fire Industry Equipment Research Organization**, with the support of Southern Area Fire Equipment Research, Northern Area Fire Equipment Research and Central Area Fire Equipment Research, established the first PPE industrywide guidelines for PPE cleaning that became the basis for **NFPA 1851**.

NFPA 1851 was first published in 2001 and has been subsequently updated twice. But in all that time, few changes have been made for dictating how turnout clothing should be cleaned.

NFPA 1851 establish three levels cleaning: routine, advanced and specialized.

## **LEVELS OF CLEAN**

Routine cleaning is what takes place at the incident scene, although it also prescribes machine cleaning and cleaning turnout in a utility sink. In some parts of the standard, it is described as a form of cleaning that does not result in the gear been taken out of service.

It is further implied that routine cleaning is primarily for soiling rather than contamination. Yet, many departments are confused by this criteria.

Advanced cleaning is prescribed as machine cleaning, and there are some parameters specified for how this cleaning has to be performed. For example, a maximum wash water and drying temperatures are specified. In addition, a range of acceptable pH for wash chemicals is established.

While a maximum acceleration on the washer drum is specified at 100 Gs, both conventional home laundering machines and more sophisticated and usually programmable washer/extractors can accomplish this form of cleaning.

Advanced cleaning is required at least once a year, although the first edition required a minimum of two cleanings. An often overlooked requirement is applying advanced cleaning whenever the conditions of soiling and use dictate a more thorough cleaning.

Specialized cleaning is relegated to any unusual contamination that takes place. While NFPA 1851 implies that this cleaning is for hazardous chemicals and certain other dangerous substances, no specific procedures are provided within the standard.

Many fire departments simply do not know what specialized cleaning refers to, believing it to be needed when clothing must be sent to an independent service provider for cleaning.

## **PROPOSED CLEANING CHANGES**

The committee responsible for NFPA 1851 will modernize the standard's requirements that apply to cleaning.

More importantly, the committee is working on changes that will provide a logical progression for how cleaning is undertaken and create a decision-making process for determining whether clothing can be adequately cleaned and what procedures need to be applied.

The committee is maintaining the three levels of cleaning, but has redefined routine cleaning as on scene or preliminary cleaning. This cleaning is now defined as gross decontamination that takes place as soon as possible after the fire event.

Wet or dry decontamination are recommended, although there is emerging research that shows wet decontamination is significantly more effective than simply brushing off the debris on the outside of the firefighter ensemble. Moreover, this cleaning must take place while the firefighter is still on air and must be performed in a controlled fashion.

It is recognized that such procedures are not always practical, so the standard requires the fire department perform some form of cleaning as soon as possible following the exposure event.

Requirements for advanced cleaning are also being tightened. It has been proposed that NFPA 1851 specify that cleaning always take place in an appropriate washer/extractor; use of ordinary top loading washing machines will be prohibited.

Additional provisions are made for how the cleaning is to be carried out, including the use of validated wash chemicals and process. Proposed default washing formulations – the set of instructions for the washer/extractor for how clothing is to be cleaned – are also being proposed.

And significantly more detail is being provided for cleaning items such as helmets, hoods, gloves and footwear, which the standard only now provides cursory information.

## **DECISION-MAKING GUIDANCE**

As proposed, NFPA 1851 will further establish more details for how specialized cleaning will take place and when it is to be applied. For example, distinctions are made in cleaning procedures between heavily fireground-soiled clothing versus clothing subject to blood-borne pathogens.

These procedures are in contrast to clothing that is contaminated by bulk chemicals, other hazardous substances and known problem contaminants such as asbestos.

The standard intends to make the decision process easier by potentially including a flowchart that will walk a department through the decisions it must make to ensure adequate cleaning.

The flow chart is provided in two parts. Part one is the general procedures for deciding on what type of cleaning to apply; part two shows more detailed procedures for addressing various forms of contamination.

It is important to recognize that all this information is preliminary, as the proposed changes are subject to review by the technical committee that must ensure that appropriate requirements are established.

Yet, NFPA standard making is an open and transparent process, and thus public input and comment are solicited for all proposed changes. The committee invites feedback on any proposed revisions. The new revisions are likely to appear publicly in the first draft of the standard in September on the [NFPA webpage](#) for the NFPA 1851 standard.

Adequate cleaning requirements for clothing is only one part of the process for protecting firefighters from unnecessary continued exposure to fireground contamination. As the fire service continues to incorporate these and other practices, the hope is that the associated hazards of firefighter can be minimized.

## 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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