



# Understanding & Implementing STANDARDS

NFPA 1851



## Acknowledgements

The National Volunteer Fire Council (NVFC) would like to thank the National Fire Protection Association (NFPA) for their assistance in developing this guide. As an advocate of fire prevention and an authoritative source on public safety, the NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks. The NVFC is proud to work with the NFPA to promote a culture of safety within the fire and emergency services.

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## Introduction

Standards are an attempt by an industry or profession to self-regulate by establishing minimal operating, performance, or safety criteria. Consensus standards are developed by specific industries to describe widely accepted standards of care and operations for certain practices. They are written by consensus committees composed of industry representatives and other affected parties.

One of the most well-known and respected standards organizations is the National Fire Protection Association (NFPA). Since 1896, the NFPA has developed standards directly affecting the fire service at the department level. As an advocate of fire prevention and an authoritative source on public safety, the NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks. The NFPA's National Fire Codes® are administered by more than 250 Technical Committees comprised of approximately 8,000 volunteers and are adopted and used throughout the world.

The National Volunteer Fire Council (NVFC), the leading organization representing the volunteer fire, emergency medical, and rescue services, understands that adopting these standards in their totality may not be feasible for every department due to limited resources or unfamiliarity with the standard(s). Small volunteer departments may face additional challenges because of shrinking budgets and limited staffing. Despite these challenges, creating and maintaining a safe environment is critical to ensure the health and safety of firefighters. In order to address these challenges and help

departments reach their safety goals, the NVFC and the NFPA collaborated in 2012 to create a series of guides intended to assist volunteer department reach their safety goals. These guides can be accessed at [www.nvfc.org](http://www.nvfc.org) or [www.nfpa.org](http://www.nfpa.org).

In this edition, readers will find information on the 2014 edition of the *1851 Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. The NVFC and NFPA originally covered the 1851 standard in their inaugural guide. This document includes information from the latest revision cycle completed in 2014.

The proper care and maintenance of PPE are extremely important for firefighter health and safety. Instances of firefighter cancer have been directly linked to exposure through improper PPE use, care, maintenance, and handling/storage. In addition, the effectiveness of PPE is diminished without proper care and maintenance, leaving responders at risk. NFPA 1851 is a critical standard to understand and implement in your department.

In this guide, you will find section extracts from the standard that include commentary provided by the NFPA. The analysis offers action items and highlights existing resources to assist departments. A checklist is also provided to help departments.

Keep in mind that this guide only provides a snapshot of the standard. Refer to [www.nfpa.org/1851](http://www.nfpa.org/1851) for FREE access the standard in its entirety.

# Developing NFPA Codes and Standards

Many wonder how NFPA codes and standards come into existence or how they are revised. The following section details the standard development and review process and also explains how members of the fire service can get involved.

The codes and standards development process begins with the NFPA Board of Directors. The board has general charge over all NFPA activities and issues all of the rules and regulations that govern the development of NFPA codes and standards. The board also appoints a 13-person Standards Council to oversee the Association's standards development activities, administer rules and regulations, and serve as an appeals body.

Members of the Standards Council are thoroughly familiar with the standards development functions of the Association and are selected from a broad range of interests. More than 250 Technical Committees and Panels are appointed by, and report to, the Standards Council. They serve as the primary consensus bodies responsible for developing and revising NFPA codes and standards. In addition to acting on their own proposed changes, these Technical Committees and Panels act on proposed changes to NFPA documents that can be submitted by any interested party.

To conduct their work, Committees and Panels are organized into projects with an assigned scope of activities. Depending on the scope, a project may develop one code or standard or a group of related codes and standards, and the project may consist of a single Technical Committee or multiple Committees and Panels coordinated by a Correlating Committee that oversees the project to resolve conflicts and ensure consistency.

## Rules and Participants

There are many rules and regulations that must be followed during the codes and standards development process. Primarily these include the:

- NFPA Regulations Governing the Development of NFPA Standards
- NFPA Bylaws
- Technical Meeting Convention Rules

- Guide for the Conduct of Participants in the NFPA Standards Development Process
- Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council

All of these rules and regulations are available by request from the NFPA or can be downloaded from the NFPA's web site at [www.nfpa.org/regs](http://www.nfpa.org/regs). All participants should refer to the actual rules and regulations for a full understanding of this process and for the rules that govern participation.

## Establishing a Consensus Body

In the NFPA standards development process, NFPA Technical Committees and Panels serve as the principal consensus bodies responsible for developing and updating all NFPA codes and standards. Committees and Panels are appointed by the Standards Council and typically consist of no more than 30 voting members representing a balance of interests. NFPA membership is not required in order to participate on a NFPA Technical Committee, and appointment is based on factors such as technical expertise, professional standing, commitment to public safety, and the ability to bring the viewpoints of interested people or groups to the table. Each Technical Committee is constituted to maintain a balance of interests, with no more than one-third of the Committee from the same interest category. The categories generally used by the Standards Council to classify Committee members are:



**1. Insurance:** A representative of an insurance company, broker, agent, bureau, or inspection agency



**2. Consumer:** A person who is or represents the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in (1)



**3. Enforcing Authority:** A representative of an agency or an organization that promulgates and/or enforces standards



**4. Labor:** A labor representative or employee concerned with safety in the workplace



**5. Installer/Maintainer:** A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard



**6. Manufacturer:** A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard



**7. Applied Research/Testing Laboratory:** A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards



**8. User:** A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard



**9. Special Expert:** A person not representing (1) through (8), and who has special expertise in the scope of the standard or portion thereof

The Committee must reach a consensus in order to take action on an item.

## Sequence of Events for the Standards Development Process

The NFPA process encourages public participation. All NFPA codes and standards (also referred to here simply as standards) are revised and updated every three to five years in revision cycles that begin twice each year and that normally take approximately two years to complete. Each revision cycle proceeds according to a published schedule. The process contains four basic steps:

### Step 1 – Input Stage

- Input is accepted from the public or other Committees for consideration to develop the first draft. Visit [www.nfpa.org/submitpipc](http://www.nfpa.org/submitpipc) to learn how to do this online.

- The Technical Committee then holds a first draft meeting to revise the standard. If necessary, the revisions are reviewed by the Correlating Committee. A vote by ballot on the first draft is held, and then the draft is posted for public review.

### Step 2 – Comment Stage

- Public comments are accepted on the first draft for 10 weeks. Visit [www.nfpa.org/submitpipc](http://www.nfpa.org/submitpipc) to learn how to submit a public comment online.
- If the standard does not receive public comments and the Technical Committee does not wish to further revise the standard, the standard becomes a “consent standard” and is sent directly to the Standards Council for issuance. Consent standards bypass an Association Technical Meeting and proceed directly to the Standards Council for issuance. If there are public comments, then the Committee holds a second draft meeting.
- If necessary, the Technical Committee and Correlating Committee votes on the second draft by ballot and then posts the second draft report for review.

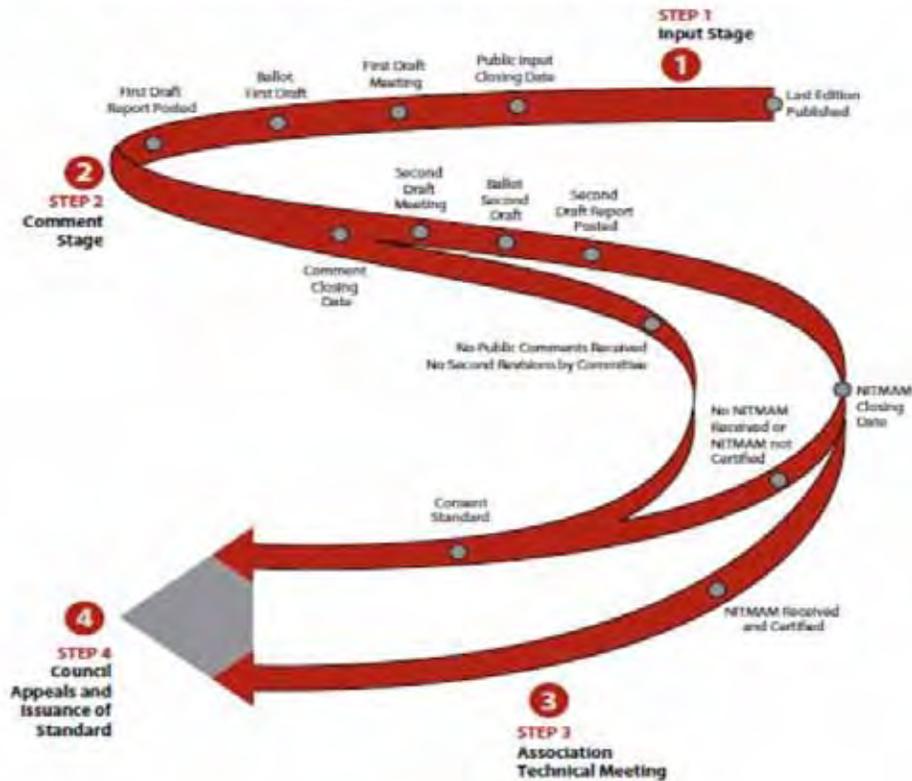
### Step 3 – Association Technical Meeting

- Anyone challenging the proposed contents after the completion of second draft balloting can file a Notice of Intent to Make a Motion (NITMAM). NITMAMs are reviewed, and valid motions are certified for presentation at the Association Technical Meeting.
- NFPA membership meets each June at the Association Technical Meeting and acts on standards with “Certified Amending Motions” (certified NITMAMs).
- Committee(s) and Panel(s) vote on any successful amendments to the Technical Committee Reports made by NFPA members at the Association Technical Meeting.

### Step 4 – Council Appeals and Issuance of Standard

- Notification of intent to file an appeal to the Standards Council must be filed within 20 days of the Association Technical Meeting.
- The Standards Council decides, based on all evidence, whether or not to issue the standard or to take additional action.

# The Standards Development Process



## Application of NFPA Standards for Volunteers

In most cases, compliance with NFPA standards is voluntary. However, in some cases, federal or state Occupational Safety and Health agencies (OSHA) have incorporated wording from NFPA standards into regulations. In these cases, complying with the standards is mandatory.

Regardless of whether NFPA standard compliance is voluntary or mandatory, fire and rescue departments must consider the impact of "voluntary" standards on private litigation. In some states, a department may be liable for the negligent performance of their duties. Most state laws do not protect fire or rescue departments for gross negligence, even in states that protect rescue workers under an immunity statute. Essentially, negligence involves the violation of a standard of care that results in injury or loss to some other individual or organization. In establishing the standard of care for rescue operations, the courts will frequently look to the "voluntary" standards issued by the NFPA and other organizations. Although "voluntary" in name, these standards can become, in effect, a legally enforceable standard of care for a fire or rescue department. Accordingly, fire and rescue departments should pay close attention to applicable standards.

## Get Involved

Unfortunately, the fire service does not always take advantage of the process until codes or standards are validated and final. It is extremely important to participate in the revision process. The fire service should write proposals, suggest changes, add and delete content, and become acutely aware of the timing of both proposals and public comment periods. Additionally, fire service members should consider volunteering to sit on a Technical Committee.

The fire service should take a proactive approach to the codes and standards process to assure its needs and concerns are being considered. NFPA Technical Committee Meetings are open to everyone, and individuals are also invited to apply for Committee membership.

Visit [www.nfpa.org/tcapply](http://www.nfpa.org/tcapply) for more information. Additionally, visit the NFPA document information pages at [www.nfpa.org/1851](http://www.nfpa.org/1851) to view the complete standard featured in this guide free of charge, and to find meeting notices, agendas, minutes, and much more.



# NFPA 1851 Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting

The following are excerpts from NFPA 1851. Readers are encouraged to view the standard in its entirety at [www.nfpa.org/1851](http://www.nfpa.org/1851).

**Please note:** An asterisk (\*) indicates that additional explanatory material can be found in Annex A of the standard. Annex A can be accessed at [www.nfpa.org/1851](http://www.nfpa.org/1851).

# Administration

## 1.1 Scope

**1.2** This standard shall specify the minimum selection, care, and maintenance requirements for structural fire fighting protective ensembles and the individual ensemble elements that include garments, helmets, gloves, footwear, and interface components **that are compliant with NFPA 1971, Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting.**

## Commentary

NFPA standards are minimum, voluntary consensus standards. While they are minimum standards, nothing prohibits the Authority Having Jurisdiction (AHJ) from exceeding them. It is important to note that the NFPA does not write the standards but instead acts to facilitate the process of standard development. NFPA 1851 is written to be a companion to NFPA 1971 on compliant ensembles and ensemble elements. You can view NFPA 1971 at [www.nfpa.org/1971](http://www.nfpa.org/1971).

## 1.3 Purpose

**1.3.1** The purpose of this standard shall be to establish a program for structural fire fighting protective ensembles and ensemble elements and for proximity fire fighting protective ensembles and ensemble elements to reduce the safety risks and potential health risks associated with poorly maintained, contaminated, or damaged protective ensembles and ensemble elements.

**1.3.2** The purpose of this standard shall also be to establish basic criteria for selection, inspection, cleaning, decontamination, repair, storage, and retirement of structural fire fighting protective ensembles or ensemble elements and proximity fire fighting protective ensembles or ensemble elements.

## Commentary

NFPA 1851 establishes a program and criteria for the selection, care, and maintenance of structural and proximity ensembles and ensemble elements. This standard does not apply to protective ensembles or clothing that must be compliant with other NFPA standards on technical rescue, wildland, vapor-protective ensembles for hazmat operations, liquid-splash protective ensembles for hazmat operations, CBRN terrorism incidents, and emergency medical operations.

The AHJ always has the ultimate authority to determine how an organization maintains their gear and equipment. The overall purpose of the standard is to ensure and heighten firefighter safety and to make sure that the PPE being used is inspected and maintained properly.

## Authority Having Jurisdiction (AHJ)

An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

## Ensemble

(Structural Fire Fighting Protective Ensemble and Proximity Fire Fighting Protective Ensemble) Multiple elements of compliant protective clothing and equipment that when worn together provide protection from some risks, but not all risks, of emergency incident operations.

## Ensemble Elements

The compliant products that provide protection to the upper and lower torso, arms, legs, head, hands, and feet.



## Program

### 4.1 General

**4.1.1\*** The organization shall develop and implement a program for the selection, care, and maintenance of structural fire fighting ensembles and ensemble elements and proximity fire fighting ensembles and ensemble elements used by the members of the organization in the performance of their assigned functions.

#### Commentary

This section requires the organization to develop a selection, care, and maintenance program and to determine the components of the program. Structural and proximity firefighting protective ensembles are subject to many stressors and do not have an extended life span. The following table serves as a great starting point for creating an outline for an 1851 compliant program. There is no verification or certification that proves an organization is compliant with 1851, but being able to show these elements as part of an overall program can assist an organization in following the standard's recommendations.

#### Action Item



Develop and implement a program for the selection, care, and maintenance of structural and proximity firefighting ensembles.

### 4.2 Program Organization

**Table 4.2.2 Required Program Parts for Structural and Proximity Fire Fighting Protective Ensembles and Elements**

Program Part	Chapter/Section of NFPA 1851
Records	Section 4.3
Protecting the public and personnel from contamination	Section 4.5
Selection	Chapter 5
Inspection	Chapter 6
Cleaning & decontamination	Chapter 7
Repair	Chapter 8
Storage	Chapter 9
Retirement, disposition, and special incident procedures	Chapter 10

**4.2.3\*** The organization shall not add or permit accessories to be added to any ensemble or ensemble element prior to the organization requesting approval in writing and receiving written approval from the ensemble or ensemble element manufacturer for each specific accessory.

**Commentary**

There is more language in the standard in this section concerning accessories, but the important takeaway is to contact the manufacturer with any questions about accessories to determine if their addition can damage or limit an ensemble or ensemble element. Basically, this section is prohibiting the addition of accessories that might compromise the integrity of the PPE to ensure that potentially unsafe situations are reduced or eliminated.

**Action Item**

 Contact the manufacturer before adding accessories to any ensemble or ensemble element.

**4.2.4\*** The organization shall use one of the following to perform advanced cleaning, advanced inspection, and repair services of ensembles and ensemble elements:

- (1) Manufacturer-trained organization for its own organization's elements only
- (2) Verified organization
- (3) Verified independent service provider (ISP)

**Accessory/Accessories**

An item, or items, that could be attached to a certified product but that are not necessary for the certified product to meet the requirements of the standard.

**Manufacturer**

The entity that directs and controls any of the following: compliant product design, compliant product quality assurance; or the entity that assumes the liability for the compliant product or provides the warranty for the compliant product.

**Verified Independent Service Provider (ISP)**

An independent service provider verified by a third-party certification organization to conduct any one or a combination of advanced inspection, advanced cleaning, basic repair, or advanced repair service.

**Table 4.2.4 Responsibilities for Garment Element Inspection, Cleaning, and Repair**

	MFG	V ISP	V ORG	MT ORG	USER
Routine inspection (6.2)					x
Advanced inspection (6.3)	x	x	x	x	
Complete liner inspection (6.4)	x	x	x	x	
Routine Cleaning (7.2)					x
Advanced cleaning and decontamination (7.3)	x	x	x	x	
Basic repair (8.2, 8.3)	x	x	x	x	
Advanced repair (8.2, 8.4)	x	x	x		
Training provider	x	x			

MFG: Element manufacturer. V ISP: Verified ISP. V ORG: Verified organization. MT ORG: Manufacturer-trained organization. USER: End User.

### Verified Organization

An organization verified by a third-party certification organization to conduct any one or a combination of advanced cleaning, advanced inspection, basic repair, and advanced repair on any organization's elements.

### Manufacturer-Trained Organization

A non-verified organization trained by an element manufacturer of the same element type to conduct any one or a combination of advanced cleaning, advanced inspection, and basic repair on the organization's elements.

### User

The individual using the ensemble elements.

### Commentary

The featured chart is an easy way to determine who is allowed, per the standard, to perform certain actions. Again, if there's ever a question about a particular piece of turnout gear, consult the manufacturer to determine what action(s) should be taken. Obviously, the list of providers is more rigid or restrictive as the actions become more detailed and involved. These actions require properly trained individuals to ensure safety.

### 4.3 Records

**4.3.3** At least the following records shall be kept for each protective ensemble or ensemble element:

- (1) Person to whom element is issued
- (2) Date and condition when issued
- (3) Manufacturer and model name or design
- (4) Manufacturer's identification number, lot number, or serial number
- (5) Month and year of manufacture
- (6) Date(s) and findings of advanced inspection(s)
- (7) Date(s) and findings of advanced cleaning or decontamination
- (8) Reason for advanced cleaning or decontamination and who performed cleaning or decontamination
- (9) Date(s) of repair(s), who performed repair(s), and brief description of repair(s)
- (10) Date of retirement
- (11) Date and method of disposal

### Commentary

Records should be kept for each protective ensemble or ensemble element. The list provided in this excerpt is a baseline. Your organization may - and probably should - think about what other data is valuable and what other information you want to capture about each ensemble and ensemble element to ensure you have a complete picture of the life of that gear. For instance, you may want to track specific calls a particular piece of PPE participated in or which truck or engine it was on based on use, hazards, etc. The more data that can be collected and maintained the better off the organization will be in determining future needs of the department with regard to PPE.

### Action Item



Keep detailed records for each protective ensemble or ensemble element currently in use.

# Selection

## 5.1\* Selection and Purchase

**5.1.1\*** Prior to starting the selection process of structural fire fighting ensembles and ensemble elements and proximity fire fighting ensembles and ensemble elements, the organization shall perform a risk assessment.

**5.1.2** The risk assessment shall include, but not be limited to, the hazards that can be encountered by structural or proximity fire fighters based on the following:

- (1)\* Type of duties performed
- (2) Frequency of use of ensemble elements
- (3) Organization's experiences
- (4) Incident operations
- (5) Geographic location and climate
- (6)\* Specific physical area of operation
- (7)\* Likelihood of or response to CBRN terrorism incident

### Commentary

Conducting a risk assessment is necessary to ensure that the selected PPE meets the level of protection needed based on the hazards that the end users are going to be exposed to. The assessment should include a review of the type of duties performed, frequency of use, past experience, incident operations, geographic location and climate, and the likelihood of responding to a CBRN terrorism incident.

This step is vital in the process. The absence of a risk assessment may put your personnel at risk. The provided list includes minimum criteria, and further development for the risk assessment process may need to occur to fit the needs of your jurisdiction.

### Action Item

- Conduct a risk assessment to determine the appropriate firefighting ensembles before selecting or purchasing.





## Inspection

### 6.1 General

**6.1.2** Any ensemble elements that are found to be soiled or contaminated shall be cleaned or decontaminated before any additional inspection is initiated. Where ensemble elements are found to be contaminated by Chemical, Biological, Radiological, Nuclear (CBRN) agents, the ensemble shall be retired.

#### Commentary

Cleaning and decontamination of soiled or contaminated ensemble elements must take place before additional inspection occurs. Cleaning and decontamination are important in maintaining the integrity of the gear and in reducing exposure to carcinogens.

#### Action Items

- ✓ Inspect all soiled ensembles after cleaning or decontamination.
- ✓ Retire any ensemble that is contaminated by CBRN agents.

### 6.2 Routine Inspection

**6.2.1** Individual members shall conduct a routine inspection of their protective ensembles and ensemble elements upon issue and after each use.

**6.2.2\*** The routine inspection shall include, as a minimum, the inspections specified in 6.2.2.1 through 6.2.2.7. See Table A.6.2.2 for further items that could be included.

#### Commentary

This section puts some of the responsibility and accountability on the individual member to do a routine inspection of the gear issued to them. It is important that individuals are aware of the condition of their PPE.

The following elements should be checked as part of a routine inspection:

- (1) Soiling
- (2) Contamination
- (3) Physical damage such as the following:
  - (a) Rips, tears, and cuts
  - (b) Damaged or missing hardware and closure systems
  - (c) Thermal damage (charring, burn holes, melting, discoloration of any layer)
- (4) Damaged or missing reflective trim
- (5) Loss of seam integrity and broken or missing stitches

This is a basic list that applies to most ensemble elements that can be used on a daily basis. Refer directly to Chapter 6 in the standard for specifics for each element. Refer to the chart.

Remember that advanced inspection must be completed by an element manufacturer, a trained manufacturer, or a verified organization or ISP.

#### Soiled/Soiling

The accumulation of materials that are not considered hazardous materials, body fluids, or CBRN terrorism agents but that could degrade the performance of ensemble or ensemble elements.

#### Contamination/Contaminated

The process by which ensembles and ensemble elements are exposed to hazardous materials, body fluids, or CBRN terrorism agents.

Table A.6.2.2 Routine Inspection Criteria

Criteria	Coats & Trousers	Hoods	Helmets	Gloves	Footwear	Drag Rescue Device
Soiling	x	x	x	x	x	x
Contamination	x	x	x	x	x	x
Tears and cuts	x	x	x	x	x	x
Damaged missing hardware or closure system	x					
Charring, burn holes, melting	x	x	x	x	x	x
Shrinkage	x	x	x	x	x	
Material discoloration	x	x	x	x	x	x
Damaged or missing visibility markings	x					
Loss of face opening elasticity or adjustability		x				
Cracks, dents, abrasions			x	x		
Bubbling, soft spots, warping			x			
Damaged or missing components of suspension or retention systems			x			
Damaged or missing components of faceshield/goggle system, including discoloration and scratched lenses			x			
Inverted liner				x		
Exposed or deformed steel toe, steel midsole, or shank					x	
Loss of water resistance					x	
Closure system component damage and functionality					x	
Earflaps: rips, tears, or cuts; thermal damage such as charring, burn holes, or melting			x			
Size compatibility	x					x

## Routine Inspection Criteria – Specific to Proximity PPE

Proximity Ensemble & Ensemble	Coat & Trouser Garment	Helmet Overcover	Shrouds	Helmet	Glove	Footwear
Loss of reflectivity	x	x	x		x	x
Loss of reflective coatings	x	x	x		x	x
Delamination as evidenced by separation or peeling of outer shell	x	x	x			
Damaged or missing reflective trim		x				
Damage and functionality of the overcover to helmet attachment		x				
Damage and functionality of the shroud to helmet attachment			x			
Distortion of face opening resulting in gaps around the faceshield			x			
Loss of faceshield reflectivity				x		
Loss of shell reflectivity				x		

### 6.2.3 Additional Routine Inspection Requirements for Proximity Fire Fighting Protective Ensembles and Ensemble Elements.

#### Commentary

This section provides clarification as to what the end user should be including as part of their routine inspection specific to proximity PPE. The requirements vary slightly since there is a difference in the materials used in structural and proximity PPE.

#### Action Items

-  Require all members to inspect their ensembles after each use, reporting any issues to determine if any additional action is necessary.
-  Have a manufacturer, a trained manufacturer, or a verified organization or ISP perform an advanced inspection whenever a routine inspection indicates that there may be an issue.

# Cleaning and Decontamination

## 7.1 General

- 7.1.1\* Organizations shall provide a means for having ensemble elements cleaned and decontaminated.
- 7.1.2 Ensembles and ensemble elements shall be evaluated by the wearer for application of appropriate cleaning level after each use.

### Commentary

This section of the standard is to ensure that the cleaning and decontaminating of ensemble elements is the responsibility of the organization, not the individual. This section also ensures that ensemble elements are being cleaned and decontaminated appropriately.

Applying the appropriate cleaning level helps to avoid unnecessary exposure and long term health risks, such as cancer, for both the wearer and others. Conducting an evaluation after each use ensures timely action is taken, thereby reducing exposure and risk.

Routine cleaning should be used for spot treatments. Advanced cleaning is needed if routine cleaning procedures do not render the ensemble or ensemble element sufficiently clean for service. Specialized cleaning is needed for ensembles or ensemble elements that are known or suspected to be contaminated with hazardous materials or body fluids.

It is important to note who is responsible for what: organizations must provide a means for cleaning and decontamination, but the wearer is responsible for, not only conducting routine inspections, but for also for making sure the appropriate cleaning level is applied after each use.

**Remember:** To reduce risk and avoid exposure, some form of cleaning must occur immediately after an event and before wearing the gear again. Gloves, helmets (hoods and ear covers), and footwear must also be cleaned. It is important to keep soiled or contaminated elements out of the home, home laundries, public laundries, personal vehicles, apparatus, and living/sleeping quarters to limit exposure.

### Action Items

- ✓ Develop and implement a cleaning and decontamination policy for all ensembles.
- ✓ Provide the means for cleaning and decontaminating ensemble elements.
- ✓ Have individuals conduct an evaluation of their gear after each use and immediately apply the appropriate cleaning level.
- ✓ Keep soiled or contaminated elements out of the home, home laundries, public laundries, personal vehicles, apparatus, and living/sleeping quarters to limit exposure.



### Cleaning

The act of removing soils and contaminants from ensembles and ensemble elements by mechanical, chemical, thermal, or combined processes.

### Advanced Cleaning

The thorough cleaning of ensembles or elements by washing with cleaning agents.

### Routine Cleaning

The light cleaning of ensembles or elements performed by the end user without taking the elements out of service.

### Specialized Cleaning

Cleaning to remove hazardous materials or body fluids.

### Decontamination

The act of removing contaminants from protective clothing and equipment by a physical, chemical, or combined process.

**7.1.4\*** Ensembles and ensemble elements that are known or suspected to be contaminated with hazardous materials shall be evaluated on the incident scene by members of the organization authorized by the organization to conduct a preliminary assessment of the extent of contamination and the need for ensemble or ensemble elements to be isolated, tagged, and bagged on scene.

#### **Commentary**

With regard to hazardous materials, it is important to note that the wearer must alert a member of the organization authorized to conduct a preliminary assessment. If there happens to be a situation where one person thinks they may have been exposed but others were not, it is still up to the wearer to bring it to the attention of the organization. There are certainly times when the authorized member(s) of an organization will check all the gear after a clear exposure, but that may not always be the case.

It is also important to note that the same process should be followed for ensembles contaminated with body fluids.

#### **Action Item**



Train individuals to alert authorized organization members to conduct a preliminary assessment after hazardous materials exposure or body fluid contamination.

### **7.2 Routine Cleaning**

**7.2.1\*** The end users shall be responsible for the routine cleaning of their issued ensemble and ensemble elements.

**7.2.3.1\*** Where possible, the contamination levels shall be evaluated and cleaning shall be initiated at the emergency scene.

**7.2.3.2** Ensembles and element layers shall be isolated whenever possible to avoid cross contamination.

**7.2.3.3** Any dry debris shall be brushed off.

**7.2.3.4** Other debris shall be gently rinsed off with water. Heavy scrubbing or spraying with high-velocity water jets such as a power washer shall not be used.

**7.2.3.5** Where necessary, a soft bristle brush shall be used to gently scrub, and the ensemble or element shall be rinsed off again.

#### **Commentary**

These excerpts could easily be worked into an SOP as a procedure. All individuals are responsible for routine cleaning of their gear. Keep the following guidelines in mind for routine cleaning:

- Elements for routine cleaning should be cleaned in a utility sink designated for PPE.
- Pretreat heavily soiled or spotted areas.
- Keep the water temperature below 105 degrees.
- Detergents should have a pH range of not less than 6.0 and not greater than 10.5.

- Wear protective gloves and eye/face protection.
- Use a soft bristle brush.
- Thoroughly rinse all elements.
- Rewash if necessary after inspection.
- Dry elements using the manufacturer label instructions.
- Rinse the utility sink when cleaning is complete.

Routine cleaning procedures are only to be used for spot cleaning. Elements such as helmets, gloves, footwear, and proximity firefighting ensembles have additional considerations:

*Helmet Elements:*

- Separate the impact cap from the helmet shell if the helmet must be totally immersed. Wash and dry each component separately.
- Do not use solvents.
- Do not machine dry.

*Glove Elements:*

- Do not machine dry.

*Footwear Elements:*

- Do not machine dry.

*Proximity Fire Fighting Ensembles and Ensemble Elements:*

- Do not use a brush or other abrasive devices to clean the outer shell and other reflective components.

Advanced cleaning procedures should be used for cleaning the entire ensemble, meaning only the manufacturer, a manufacturer trained organization, a verified organization, or a verified ISP can perform this task.

**Action Item**



Develop and implement an SOP detailing cleaning and decontamination procedures.



## Repair

### 8.1 Requirements for All Ensembles and Ensemble Elements

**8.1.1** All repairs shall be performed by the original manufacturer, a verified ISP who has received training, or a member of the organization who has received training.

#### Commentary

All repairs must be performed by the original manufacturer, a verified ISP who has received training, or a member of the organization who has received training. Ensembles must be subject to advanced cleaning before any repair when applicable.

#### Action Item



Have the manufacturer, an ISP, or trained department personnel conduct any repairs to ensembles or ensemble elements.

## Storage

### 9.1 All Ensembles and Ensemble Elements

**9.1.1\*** Ensembles or ensemble elements shall not be stored in direct sunlight or exposed to direct sunlight while not being worn.

#### Commentary

Direct sunlight has been shown to negatively impact the protective properties of the PPE.

**9.1.2\*** Ensembles and ensemble elements shall be clean and dry before storage.

#### Commentary

This seems more obvious that not, but if PPE is stored dirty or wet it too can have a negative impact on the protective properties of the PPE.

**9.1.3** Ensemble and ensemble elements shall not be stored in airtight containers unless they are new and unissued.

#### Commentary

Ensemble elements must not be stored in air-tight containers unless they are new and unissued. Do not store ensembles or ensemble elements in temperatures below -25°F or above 180°F. Ensembles and ensemble elements must not be stored or transported in compartments or trunks with sharp objects, tools, or other equipment that could damage them. If the elements must be transported in such environments, they should be placed in a protective case or bag to prevent damage.

Soiled ensemble elements must not be stored in living quarters or transported in the passenger compartment of personal vehicles. If ensembles must be transported or stored in this manner, they should be placed in a protective case or bag to prevent cross contamination. Do not store ensemble elements where they could come in contact with contaminants such as oils, solvents, acids, or alkalis. Proximity firefighting coats and trousers must be stored by hanging to limit the damage caused by creasing or folding. Store the ensembles in clean, dry, and well-ventilated areas.





## Retirement, Disposition, and Special Incident Procedure

### 10.1 Retirement

**10.1.2\*** Structural fire fighting ensembles and ensemble elements shall be retired in accordance with 10.2.1 or 10.2.2, no more than 10 years from the date the ensembles or ensemble elements were manufactured.

#### Commentary

The annex material associated with this section clarifies further:

*A.10.1.2 After discussion of the concept of mandatory retirement for protective elements, the consensus of the Technical Committee, led by the fire service segment, is that the life of a turnout suit is generally less than 10 years. Regardless of when the element was originally produced, it is imperative that the protective elements be routinely inspected to ensure that they are clean, well maintained, and still safe. Just knowing the age of the elements cannot do that. In the 2014 revision cycle the Technical Committee, led by the fire service, again reaffirmed this position.*

**10.1.4\*** Structural fire fighting ensembles and ensemble elements and proximity fire fighting ensembles and ensemble elements that are worn or damaged to the extent that the organization deems it not possible or cost effective to repair them shall be retired in accordance with 10.2.1.

#### Commentary

Organizations need to evaluate their PPE and make the determination to retire based on damages beyond repair. PPE may need to be replaced prior to reaching the 10 year mark based on wear and tear. A cost analysis evaluating the remaining economic benefit and the remaining level of protective properties relative to the 10 year cutoff may also be helpful in determining when to retire PPE.

#### Action Items

- ✓ Retire structural and proximity ensembles and ensemble elements no more than 10 years after the date of manufacture.
- ✓ Routinely inspect protective elements to evaluate effectiveness. Don't just rely on the 10 year date as the sole indicator.

### 10.2 Disposition of Retired Elements

**10.2.1** Retired structural fire fighting ensembles and ensemble elements and proximity fire fighting ensembles and ensemble elements shall be destroyed or disposed of in a manner ensuring that they will not be used in any fire fighting or emergency activities, including live fire training.

**10.2.2** Retired structural fire fighting ensembles and ensemble elements and proximity fire fighting ensembles and ensemble elements as determined in 10.1.8 shall be permitted to be used as follows:

- (1) For training that does not involve live fire, provided the ensembles and ensemble elements are appropriately marked as being for non-live fire training only
- (2) As determined by the organization

### **Commentary**

Structural and proximity firefighting ensembles and ensemble elements that are no longer of use for the organization but are not contaminated, defective, or damaged can be used for training that does not involve live fire or for other purposes determined by the organization. For example, some AHJs have determined that other uses for PPE that is no longer in service for live fire can be used by drivers, traffic personnel, or for others not participating in fire attack. The gear must be clearly marked that it is not for structural firefighting so there is no confusion.

### **Action Items**

-  Destroy or dispose of retired ensembles or ensemble elements.
-  Do not use retired ensembles or ensemble elements for live fire training.
-  Retired gear being used for purposes other than live fire training or structural firefighting must be clearly marked to avoid confusion.



## NFPA 1851 Checklist

Content	Compliance Y = Yes / N = No	Expected Compliance Date	Remarks or Modifications
<b>Program</b>			
Develop and implement a selection, care, and maintenance program for structural PPE ensemble.			
Develop a written SOP defining the following parts and roles of the program to include:			
Records			
Protection of public and personnel from contamination			
Selection			
Inspection			
Cleaning and decontamination			
Repair			
Storage			
Retirement, disposition, and special incident procedures			
The addition of accessories is limited and approved by the manufacturer.			
Use a manufacturer-trained organization, verified organization, or verified ISP to conduct advanced cleaning, inspection, and repair.			
<b>Records</b>			
Records kept for each ensemble or element on the following:			
Person to whom issued			

Content	Compliance Y = Yes / N = No	Expected Compliance Date	Remarks or Modifications
Date and condition when issued			
Manufacturer and model name or design			
Manufacturer's identification number, lot number, or serial number			
Month and year of manufacture			
Date(s) and findings of advanced inspection(s)			
Date(s) and findings of advanced cleaning or decontamination			
Reason for advanced cleaning or decontamination and who performed cleaning or decontamination			
Date(s) of repair(s), who performed repair(s), and brief description of repair(s)			
Date of retirement			
Date and method of disposal			
<b>Selection</b>			
A risk assessment was performed before selection based on the following:			
Type of duties performed			
Frequency of use of ensemble elements			
Organization's experiences			
Incident operations			
Geographic location and climate			
Specific physical area of operation			



Content	Compliance Y = Yes / N = No	Expected Compliance Date	Remarks or Modifications
Likelihood of or response to CBRN terrorism incident			
<b>Inspection</b>			
Ensemble elements found to be soiled or contaminated should be cleaned and decontaminated prior to inspection.			
Members conduct routine inspections after use for the following:			
Soiling			
Contamination			
Physical damage such as rips, tears, cuts			
Damaged or missing hardware or closure systems			
Thermal damage (charring, burn holes, melting, discoloration of any layer)			
Damaged or missing reflective trim			
Loss of seam integrity and broken or missing stitches			
Advanced inspection performed every 12 months and documented.			
<b>Cleaning and Decontamination</b>			
Organization provides a means of having PPE cleaned and decontaminated.			
Wearer evaluates PPE and determines the appropriate cleaning level after each use.			

Content	Compliance Y = Yes / N = No	Expected Compliance Date	Remarks or Modifications
Ensembles and ensemble elements known or suspected to be contaminated with hazardous materials or body fluids are evaluated at the incident scene by an organization authorized to conduct a preliminary assessment.			
End users perform routine cleaning of their issued ensemble and ensemble elements.			
Evaluate contamination levels and initiate cleaning at the emergency scene when possible.			
Separate ensembles and element layers should be separated when possible to avoid cross contamination.			
Brush off any dry debris.			
Gently rinse off other debris with water.			
When necessary use a soft bristle brush to gently scrub and then rinse again.			
Designate a utility sink for PPE.			
Heavily soiled or spotted areas are pretreated.			
Water temperature is kept below 105 degrees.			
Detergents have a pH range of not less than 6.0 and not greater than 10.5.			
Rewash items if necessary after inspection.			
Dry elements using the manufacturer label instructions.			
Rinse utility sink when cleaning is complete.			



Content	Compliance Y = Yes / N = No	Expected Compliance Date	Remarks or Modifications
Use advanced cleaning procedures for cleaning entire ensembles.			
<b>Repairs</b>			
Repairs are performed by original manufacturer, a verified ISP who has received training, or a member of the organization who has received training.			
<b>Storage</b>			
Ensembles are not stored in direct sunlight or exposed to direct sunlight.			
Ensembles and ensemble elements are clean and dry before storage.			
Ensembles and ensemble elements are not stored in airtight containers unless new and unissued.			
Ensemble and ensemble elements are stored between -25°F and 180°F.			
Ensembles or ensemble elements are not stored in compartment or trunks with sharp objects, tools or equipment. Protective bag or case is used if ensemble or element must be transported this way.			
Ensemble and ensemble elements are not stored in living quarters or with personal belongings or transported in the passenger compartment of a personal vehicle. If ensembles or elements must be transported in this manner, they should be placed in a protective bag or case.			

Content	Compliance Y = Yes / N = No	Expected Compliance Date	Remarks or Modifications
Ensemble and ensemble elements are not stored in contact with oils, solvents, acids, alkalis, or other contaminants.			
Ensemble and ensemble elements are stored in clean, dry, well-ventilated area.			
<b>Retirement and Disposition</b>			
Structural ensembles and ensemble elements and proximity ensemble and ensemble elements are retired no more than 10 years from the date of manufacture.			
Retired ensembles or elements are destroyed or disposed of so that they cannot be used in any firefighting or emergency activities, or for live fire training.			

# Available Resources

There are many resources available to help departments properly select, care for, and maintain their PPE. Find the following resources at [www.nvfc.org/firefighters/resources/](http://www.nvfc.org/firefighters/resources/) under 'Safety and Equipment':

## Education and Research

- NVFC **video series** providing short, simple tips and ideas for cleaning, maintaining, replacing, and funding PPE.
- The NVFC's **equipment management webinar series** including modules on Proper Equipment Management, Funding Equipment, Retiring Equipment, and Equipment Use and Maintenance.
- A **white paper** released by the Firefighter Cancer Support Network highlighting the firefighter cancer problem and steps that can be taken by chiefs, members, and organizations to lower the risk.
- A report from the National Institute of Standards and Technology (NIST) on **Accelerated Weathering of Firefighter Protective Clothing: Delineating the Impact of Thermal, Moisture, and Ultraviolet Light Exposures**.
- A **report** developed by the University of Illinois Fire Service Institute concerning the interrelationship of cardiovascular function, biomechanics, and the design of personal protective equipment.

## Forms and Templates

- **PPE Structural Gear Inspection Lesson Plan Template** that can serve as an informative and useful department activity, courtesy of Kootenai County Fire & Rescue.
- **Advanced inspection criteria chart** courtesy of Gear Wash PPE SafetyCare Services.
- A sample **turnout gear inspection form**.
- The NVFC's downloadable, customizable **equipment management template** can help departments track, inspect, and maintain items like structural and proximity firefighting ensembles and ensemble elements.
- **Sample toxic exposure reporting form**, courtesy of the Phoenix Fire Department.

## Procedures

- **Sample SOP for NFPA 1851** that can be customized to create a procedure for your department.
- **Guide to complying with NFPA 1851 and a compliance inspection guide** from the Texas Commission on Fire Protection.
- **Five recommended operating procedures** that will help reduce firefighters' exposure to carcinogens.
- **Seven questions** compiled by LION that you should ask a company before choosing them to clean and maintain your PPE.

## Outreach

- A **poster** created by the Firefighter Cancer Support Network to hang at the entrance of sleeping quarters and living areas to remind members not to bring gear into these spaces.
- A **poster** provided by the Firefighter Cancer Support Network and Honeywell First Responder Products to remind your members to keep their PPE clean and wash their hoods on a regular basis.
- A **poster** to remind members of the correct methods for inspecting and cleaning gear.
- A **tipsheet** on how to rid firefighting PPE of contaminants, and 8 simple ways firefighters can protect themselves against cancer with PPE, courtesy of FireRescue1 and Globe.

# Conclusion

Implementing standards can be challenging for departments. Though often daunting, it is important to remember that standards are essential in creating a healthy and safe environment for responders. Take the time to evaluate each section within a standard and develop an implementation plan based on current and

future resources. Standards can be overwhelming when examined in their entirety. Break each standard down into small segments and focus on what is attainable and achievable. Each department's timeline will vary based on available resources and capabilities, but the overall goal of member safety remains the same.

## Additional Information

### NFPA

For further information on the NFPA standards development process, please visit the NFPA homepage at [www.nfpa.org](http://www.nfpa.org).

To obtain general information regarding the standards development process, contact:

#### **NFPA Codes & Standards Administration Department**

One Batterymarch Park  
Quincy, MA 02169-7471

**Phone:** 617-770-3000

**Fax:** 617-770-3500

**Email:** [stds\\_admin@nfpa.org](mailto:stds_admin@nfpa.org)

### NVFC

The NVFC is very active in the standards development process. As of June 2016, the NVFC has representatives serving on the following NFPA committees:

- Ambulances
- Emergency Medical Services
- Fire and Emergency Service Organization and Deployment – Volunteer
- Fire Department Apparatus
- Fire Fighter Professional Qualifications
- Fire Officer Professional Qualifications

- Fire Prevention Organization and Deployment
- Fire Service Occupational Safety and Health
- Fundamentals of Fire Control Within a Structure Utilizing Fire Dynamics
- Hazardous Materials Response Personnel
- Incident Management Professional Qualifications
- Professional Qualifications Technical Correlating
- Structural and Proximity Fire Fighting Protective Clothing and Equipment
- Traffic Control Incident Management Professional Qualifications
- Wildland and Rural Fire Protection
- Wildland Fire Fighting Protective Clothing and Equipment
- Wildland Fire Management

To learn more about the NVFC's involvement, contact:

#### **National Volunteer Fire Council**

7852 Walker Drive, Suite 375  
Greenbelt, MD 20770

**Phone:** 1-888-ASK-NVFC (275-6832)

**Fax:** 202-887-5291

**Email:** [nvffoffice@nvfc.org](mailto:nvffoffice@nvfc.org)

**Web site:** [www.nvfc.org](http://www.nvfc.org)



photo courtesy of Bob Esposito, Pennsburg, PA