NFPA 1851, 2014 EDITION OVERVIEW

PRESENTED BY THE VERIFIED INDEPENDENT SERVICE PROVIDERS ASSOCIATION
NFPA 1851, 2014 EDITION

STANDARD ON SELECTION, CARE, AND MAINTENANCE OF PROTECTIVE ENSEMBLES FOR STRUCTURAL FIRE FIGHTING AND PROXIMITY FIRE FIGHTING
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CHAPTER 1 ADMINISTRATION

▪ **Scope**
  ▪ Minimum selection, care and maintenance requirements for protective personal protective equipment compliant with NFPA 1971 including structural and proximity fire fighting and optional CBRN protection

▪ **Purpose**
  ▪ Establish a program based on basic criteria for selection, inspection, cleaning, repair, storage and retirement to reduce the safety risks and potential health hazards associated with poorly maintained, contaminated or damaged PPE
CHAPTER 2 REFERENCED PUBLICATIONS

▪ National Fire Protection Association
▪ American Conference of Governmental Industrial Hygienists
▪ International Organization for Standardization
▪ U.S. Government
CHAPTER 3 DEFINITIONS

- Definitions for the terms used in the standard
- If not defined, the ordinary accepted meaning should be used
CHAPTER 4 PROGRAM

- The organization shall establish a program with the goals of providing to its members:
  - Suitable and appropriate PPE for its intended use
  - PPE maintained in a safe, usable condition
  - Removal of PPE that could contribute to injury, illness or death due to its condition
  - Reconditioning, repairing or retiring of PPE
CHAPTER 4 PROGRAM

▪ Required parts of the program
  ▪ Records
  ▪ Protecting the public and personnel from contamination
  ▪ Selection
  ▪ Inspection
  ▪ Cleaning and decontamination
  ▪ Repair
  ▪ Storage
  ▪ Retirement, disposition, and special incident procedures
CHAPTER 4 PROGRAM

The organization shall use the following to perform advanced cleaning, advanced inspection and repair services:

<table>
<thead>
<tr>
<th>Service</th>
<th>Manufacturer</th>
<th>Verified ISP</th>
<th>Verified Organization</th>
<th>Manufacturer Trained Org</th>
<th>User</th>
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<td>Advanced Inspection</td>
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<tr>
<td>Complete Liner Inspection</td>
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<td>Training Provider</td>
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* Includes decontamination
CHAPTER 4 PROGRAM

▪ Records
  ▪ Person to whom element is issued
  ▪ Date and condition when issued
  ▪ Manufacturer and model
  ▪ Manufacturer’s identification number
  ▪ Month and year of manufacture
  ▪ Dates and findings advanced inspection

▪ Dates and findings advanced cleaning and decontamination
▪ Reason for advanced cleaning or decontamination and who performed
▪ Date of repair, who performed and description of repair
▪ Date of retirement
▪ Date and method of disposal
CHAPTER 4 PROGRAM

▪ Manufacturer instructions
  ▪ Provide any manufacturer instructions, such as user guides, to the user
  ▪ Manufacturers instructions on care and maintenance must be followed
  ▪ Manufacturers shall not override the requirements of the standard for third-party verification

▪ Protecting the public and personnel from contamination
  ▪ Written SOPs that minimize public and personnel to soiled or contaminated PPE
  ▪ PPE shall not be worn or stored in living areas
  ▪ Public shall not be exposed except during emergency operations
  ▪ Soiled PPE shall not be taken home, washed at home or in public laundries
CHAPTER 5 SELECTION

- Risk assessment
  - Types of duties performed
  - Frequency of use
  - Experiences
  - Incident operations
  - Geographic location and climate
  - Specific physical area of operation
  - Likelihood of response to CBRN terrorism incident
CHAPTER 5 SELECTION

- Systematic method of comparing products related to their intended use
CHAPTER 6 INSPECTION

▪ Three Types
  ▪ Routine Inspection
  ▪ Advanced Inspection
  ▪ Complete Liner Inspection
CHAPTER 6 INSPECTION

▪ Routine inspection
  ▪ Responsibility of the individual fire fighter
  ▪ Applicable to all elements
  ▪ Performed after each use
  ▪ Any suspected damage identified should immediately result in an Advanced Inspection
CHAPTER 6 INSPECTION

▪ Routine inspection – Look for
  ▪ Soiling
  ▪ Contamination
  ▪ Physical damage
    ▪ Rips, tears, cuts
    ▪ Damaged or missing hardware
    ▪ Component functionality
    ▪ Thermal damage
  ▪ Damaged or missing reflective trim
  ▪ Loss of seam integrity or missing stitches
  ▪ Correct assembly and size
CHAPTER 6 INSPECTION

▪ Advanced inspection
  ▪ Must be performed every 12 months or whenever a potential problem exists
  ▪ Must be performed by manufacturer, verified ISP or organization, or fire department trained personnel
    ▪ Manufacturers and verified ISPs can provide training to designated personnel
  ▪ Element must be clean for inspection to be performed
  ▪ Findings must be documented
Advanced inspection

- More thorough than routine inspection
- All separable layers must be inspected individually
- Test procedures in Chapter 12 must be performed on coats and pants
ADVANCED INSPECTION TRAINING

- Resources for training on Advanced Inspection
  - XXXXXXXXXXXX
  - XXXXXXXXXXXX
  - XXXXXXXXXXXX
CHAPTER 6 INSPECTION

▪ Complete Liner Inspection
  ▪ Conducted as part of annual advanced inspection after coats and pants have been in service for 3 years or whenever a potential problem exists
    ▪ After 2 years if moisture barrier has been replaced
  ▪ Must be performed by manufacturer, verified ISP or organization, or fire department trained personnel
  ▪ Requires separating the thermal liner from the moisture barrier
  ▪ Moisture barrier is subjected to water barrier penetration barrier evaluation (see Chapter 12)
  ▪ Findings must be documented
ADVANCED INSPECTION TRAINING

- Resources for training on Advanced Inspection and Complete Liner Inspection
  - XXXXXXXXXXXX
  - XXXXXXXXXXXX
  - XXXXXXXXXXXX
  - XXXXXXXXXXXX
CHAPTER 7 CLEANING AND DECONTAMINATION

- Three types
  - Routine cleaning
  - Advanced cleaning
  - Specialized cleaning
CHAPTER 7 CLEANING AND DECONTAMINATION

▪ Routine cleaning
  ▪ Responsibility of the individual fire fighter
  ▪ Applicable to all elements
  ▪ When possible, contamination levels should be evaluated and cleaning initiated at the scene
CHAPTER 7 CLEANING AND DECONTAMINATION

- **Routine cleaning**
  - Brush off dry debris
  - Gently rinse off with garden hose
  - If necessary, scrub gently with soft bristle brush and rinse
  - If necessary, spot clean in utility sink designated for PPE
CHAPTER 7 CLEANING AND DECONTAMINATION

- Spot cleaning
  - Water 105° F max temp
  - Cleaning product pH 6 – 10.5
  - If necessary, pre-treat with non-petroleum based product
  - Wear protective gloves and eye/face splash protection
  - Thoroughly rinse
CHAPTER 7 CLEANING AND DECONTAMINATION

▪ Advanced cleaning
  ▪ Must be performed every 12 months at the time of advanced inspection or when PPE meets department’s definition of soiled
    ▪ Criteria for soiling to extent PPE needs to be cleaned must be communicated to members
  ▪ Must be performed by manufacturer, verified ISP or organization, or fire department trained personnel
    ▪ Element manufacturers and verified ISPs can provide training to designated personnel
  ▪ Element must be taken out of service
  ▪ Findings must be documented
CHAPTER 7 CLEANING AND DECONTAMINATION

▪ Advanced cleaning
  ▪ Conducted by machine unless prohibited
  ▪ Front loading washers recommended for fabric items
  ▪ Separable or detachable items are washed separately
  ▪ Manufacturer’s instructions must be followed
CHAPTER 7 CLEANING AND DECONTAMINATION

- Specialized cleaning
  - PPE known or suspected of contamination should be evaluated at the scene
    - Consult local hazardous materials team or health department
  - Use universal precautions when handling
  - MSDS required for decontamination
  - Decontamination materials and instructions on use must be available
  - Use designated area in which sinks, counters and other surfaces can be decontaminated
ADVANCED CLEANING TRAINING

- Resources for training on Advanced Cleaning
  - XXXXXXXXXXXXX
  - XXXXXXXXXXXXX
  - XXXXXXXXXXXXX

- VISPA recommends that decontamination of hazardous materials be performed by specialized cleaning professionals such as verified ISPs
CHAPTER 8 REPAIR

- Two types of repair
  - Basic repair
  - Advanced repair
CHAPTER 8 REPAIR

- All repairs and alterations must be performed in the same manner, and using like materials as the original manufacturer
- All materials and components must be compliant with NFPA 1971
- Advanced cleaning, if necessary, must be performed before repair work is undertaken
CHAPTER 8 REPAIR

- Basic repair of Garments (coats and pants) and repairs to all other repairable PPE
  - Must be performed by the original manufacturer, verified ISP, or fire department trained personnel
  - Repairs to helmets, gloves, hoods and boots can be performed by trained personnel using manufacturer’s instructions
  - Basic repairs to coats and pants performed by trained personnel are very limited and specific
CHAPTER 8 REPAIR

▪ Basic repair of coats and pants
  ▪ Patching of minor tears, car marks, and ember burns to a separable outer shell
  ▪ Repairing skipped, broken, and missing stitches to a separable outer shell
    ▪ Less than 1 continuous inch of an A seam
  ▪ Replacement of missing hardware, excluding the positive closure system on an outer shell
  ▪ Reclosing of the liner system after complete liner inspection
BASIC REPAIR TRAINING

- Resources for training on Basic Repair and repairs to other repairable PPE
  - xxxxxxxxxxxxxxx
  - xxxxxxxxxxxxxxx
  - xxxxxxxxxxxxxxx
  - xxxxxxxxxxxxxxx
CHAPTER 8 REPAIRS

▪ Advanced repairs
  ▪ Must only be performed by the original manufacturer, verified ISP or verified organization
  ▪ Verified ISPs and verified organizations must meet the requirement of Chapter 11, Verification
CHAPTER 8 REPAIRS

▪ Advanced repairs include
  ▪ All repairs to moisture barriers
  ▪ All repairs to thermal liners
  ▪ Restitching more than 1 continuous inch of a Major A or B seam
  ▪ Positive closure systems
  ▪ Trim involving an A seam
  ▪ Replacement hook and loop
  ▪ Replacement reinforcements
  ▪ Any other garment repair not listed as a basic repair
CHAPTER 9 STORAGE

- Do not store in direct sunlight
- PPE should be clean and dry before storage
- Do not store in extreme temperatures
- Do not store or transport with sharp objects, tools and other equipment without a protective bag
- Do not store soiled PPE in living quarters or with personal belongings
- Do not store with oils, solvents, acids or other chemicals
CHAPTER 10 RETIREMENT, DISPOSITION, AND SPECIAL INCIDENT PROCEDURES

▪ Retirement
  ▪ Must develop specific criteria for removing PPE from service
  ▪ Structural fire fighting elements must be retired 10 years from date of manufacture
  ▪ Proximity fire fighting elements must be retired 10 years from date of manufacture except garment radiant outer shells which must be replaced after 5 years
  ▪ PPE that are contaminated to the extent that it is not possible or cost effective to decontaminate
  ▪ PPE that are damaged to the extent that it is not possible or cost effective to repair
  ▪ PPE contaminated with CBRN agents
CHAPTER 10 RETIREMENT, DISPOSITION, AND SPECIAL INCIDENT PROCEDURES

▪ Disposition
  ▪ Retired PPE must be destroyed or disposed of in a manner that they cannot be re-used
  ▪ Retired PPE can be used for non-live fire training if they are clearly marked
CHAPTER 10 RETIREMENT, DISPOSITION, AND SPECIAL INCIDENT PROCEDURES

▪ Special Incident Procedures
  ▪ Must have procedures for handling and custody of PPE worn by fire fighters who were seriously injured or killed in the line of duty
    ▪ Immediate removal of all PPE utilized by the fire fighter
    ▪ Custody maintained at a secure location with controlled access
    ▪ PPE must be tagged and stored in paper or cardboard containers
    ▪ PPE must be examined by qualified members or outside experts
  ▪ Must have defined period of custody
Although NFPA 1851 is a fire department standard, chapter 11 describes the third-party verification process for organizations and ISPs that perform advanced inspection, advanced cleaning and advanced repairs on garment elements. ISPs must be verified by a third party certification organization to conduct any one or combination of advanced inspection, advanced cleaning, basic repair or advanced repair. To be verified to perform advanced repair, ISPs must be verified for advanced inspection and advanced cleaning. Fire departments (organizations) can perform advanced inspection, advanced cleaning and basic repairs with training. However fire departments that choose to implement an in-house program that includes advanced repairs to garments elements (structural and proximity coats and pants) must also be verified by a third party certification organization.

It should be noted that it is the fire department’s responsibility to ensure that their vendor is third-party verified when outsourcing services. Please review “How to Choose Your Service Provider” for more information.
CHAPTER 11 VERIFICATION

- Verification requirements
  - Audit confirms NFPA 1851 compliant advanced inspection and advanced cleaning methods are used
  - Repairs must pass a comprehensive series of tests
  - Audit confirms a defined and documented Quality Management Program is implemented, practiced and maintained
CHAPTER 11 VERIFICATION

- Verification of advanced repairs
  - Each composite layer (garments) is verified individually
    - ISP can only perform repairs on layers listed on their certificate
  - Each moisture barrier is verified individually
    - ISP can only perform repairs on moisture barriers listed on their certificate
CHAPTER 11 VERIFICATION

- Service providers are not permitted to use the NFPA name in statement of services without verification
- Service providers are not permitted to claim to be an ISP, verified ISP or verified organization without third-party verification
CHAPTER 11 VERIFICATION

- Organizations (fire departments) have slightly different requirements
  - Can perform advanced inspection, advanced cleaning and basic repairs with documented training
  - Must verify advanced inspection and advanced cleaning if the organization becomes verified to conduct advanced repair
CHAPTER 12 TEST PROCEDURES

▪ Three (required) test procedures for advanced inspection and complete liner inspection
  ▪ Light evaluation of liners
  ▪ Leakage evaluation
  ▪ Water penetration barrier evaluation
CHAPTER 12 TEST PROCEDURES

▪ Liner light evaluation
  ▪ Liner is separated from outer shell
  ▪ Low heat light source is positioned so thermal barrier on outside
  ▪ Liner is evaluated by examining light coming through thermal liner
  ▪ Brighter areas indicate insulating material is thin
CHAPTER 12 TEST PROCEDURES

▪ Leakage evaluation
  ▪ Liner is separated from outer shell and turned inside out
  ▪ Liner is placed on 5 gal. pail with moisture barrier up
  ▪ 1 cup alcohol-tap water mixture poured into cupped area
  ▪ Thermal liner is inspected for signs of leakage after 3 minutes
CHAPTER 12 TEST PROCEDURES

- Water penetration barrier evaluation
  - Area of moisture barrier being tested is clamped into hydrostatic test device
  - 1 psi water pressure introduced for 15 seconds
  - Visible side of moisture barrier inspected to determine if water penetrated
CHAPTER 12 TEST PROCEDURES

- Trim evaluation is recommended
  - Stand 40 ft. from trim being tested and sample new trim
  - Hold focused beam flashlight by temple and aim at trim samples
  - Compare reflected light of test trim against new trim
  - Substantially less reflected light means trim should be replaced
TEST PROCEDURE TRAINING

- Resources for training on test procedures
  - xxxxxxxxxx
  - xxxxxxxxxx
  - xxxxxxxxxx
  - xxxxxxxxxx
ANNEX A EXPLANATORY MATERIAL

For detailed explanation of the NFPA 1851 requirements, reasons for the requirements and recommendations for meeting the standard, refer to Annex A. Annex A provides practical advice for developing and implementing your NFPA 1851 compliant program.