

**MEETING OF THE NFPA
TECHNICAL COMMITTEE ON SPECIAL OPERATIONS
PROTECTIVE CLOTHING AND EQUIPMENT
ALEXANDRIA, VA
July 12-13, 2011
AGENDA**

TUESDAY - July 12, 2011

1. **8:00 a.m.** Call to order - Chairman Cox
2. Introduction of members and guests
3. NFPA Procedures and Staff Liaison Report - Dave Trebisacci
4. Approval of the minutes of the meeting in Fort Lauderdale, FL, March 29-31, 2011
5. Chairman's remarks - Chairman Cox
6. TCC update
7. NFPA 1855 public proposals (attached)
8. NFPA 1855 committee proposals
9. Document update – Task Groups
 - NFPA 1951- F2011 revision cycle
 - NFPA 1983 – F2011 revision cycle
 - NFPA 1975 – F2013 revision cycle
 - NFPA 1952 – F2014 revision cycle
 - NFPA 1953 – Contaminated Water PCE
 - NFPA 1858 – Rope/Harness SCAM
10. Old Business
11. New Business
 - Dates and locations for future meetings (March 2012)
 - Other Issues
12. Adjourn at close of business, Wednesday, July 13, 2011

1855- Log #CP1 FAE-SCE
(Entire Document)

Final Action:

Submitter: Technical Committee on Special Operations Protective Clothing and Equipment,
Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.
Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

1855- Log #1 FAE-SCE
(3.3.2 Advanced Cleaning)

Final Action:

Submitter: Karen E. Lehtonen, Lion
Recommendation: Revise text to read as follows:
Advanced Cleaning. See ~~3.3.13.1~~ 3.3.20.1.
Substantiation: Correction of referenced paragraph.

1855- Log #2 FAE-SCE
(3.3.43 Face Shield)

Final Action:

Submitter: Karen E. Lehtonen, Lion
Recommendation: Delete the definition of face shield.
Substantiation: Face shields are not required on technical rescue helmets nor is the term used in this document.

1855- Log #3 FAE-SCE
(5.1.5.1 (New))

Final Action:

Submitter: Karen E. Lehtonen, Lion
Recommendation: Add new text to read as follows:
As part of the risk assessment, the organization shall determine which type of Technical Rescue protection is needed: Utility Technical Rescue Protective Ensembles and Ensemble Elements, Rescue and Recovery Technical Rescue Protective Ensembles and Ensemble Elements or CBRN Technical Rescue Protective Ensembles. The organization shall also determine in the risk assessment if consideration is required for NFPA 1999 Standard ???is also needed.
Substantiation: There are three different types of ensembles and ensemble elements covered by NFPA 1951. They type of protection needed should be taken into consideration during the risk assessment. The added language will direct the organization to take this in to consideration during the risk assessment to evaluate what level is needed or what other standards should also be considered.

1855- Log #4 FAE-SCE
(5.1.6.1 (New))

Final Action:

Submitter: Karen E. Lehtonen, Lion
Recommendation: Add new text to read as follows:
5.1.6.1 As a minimum the organization shall ensure the proper overlap between ensemble elements being used, including but not limited to coat to hood and helmet, coat to pant, coat to glove, and pants to footwear. Any other specialty equipment being used shall also be considered to ensure the equipment does not interfere with the proper function and interface of the protective ensemble or ensemble elements.
Substantiation: Additional attention should be given to the interface areas between elements during the selection process. Specific reference to the interface areas should be called out in this standard to ensure the proper attention is given.

1855- Log #5 FAE-SCE
(6.2.2.1(6) (New))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Add new text to read as follows:

(6) Damaged, detached or missing visibility markings; when present.

Substantiation: Although visibility markings are not mandatory in NFPA 1951 if they are present they should be inspected.

1855- Log #6 FAE-SCE
(6.2.2.2(4))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(4) Physical damage to ~~the ear flaps~~ any fabric components on the helmet such as the following:

(a) Rips, tears, and cuts

(b) Thermal damage (charring, burn holes, melting)

Substantiation: Technical Rescue helmets are not required to have ear flaps. However since there may be fabric components or ear flaps provided they should be included in an inspection.

1855- Log #7 FAE-SCE
(6.2.2.2(6))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(6) Damaged or missing ~~reflective~~ visibility markings; when present.

Substantiation: The first change corrects the terminology from reflective markings to visibility markings. The second change identifies these should be inspected when present as visibility markings are not mandatory in NFPA 1951.

1855- Log #8 FAE-SCE
(6.3.3)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Advanced inspections of all protective ensemble elements, even if not issued and used, shall be conducted at a minimum of every 12 months, or whenever routine inspections indicate that a problem could exist.

Substantiation: In other SCAM documents, there is confusion in the field regarding this paragraph and if advanced inspections are required annually even if the ensemble or ensemble element is not issued or used. The added language is intended to clarify the committee intent assuming the advanced inspection is required annually regardless of the element being issued or used. See also 7.3.3 for reference.

1855- Log #9 FAE-SCE
(6.3.5.1(8))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(8) Loss of wristlet elasticity, stretching, runs, cuts, or burn holes; where present

Substantiation: Wristlets are not mandatory for garments in NFPA 1951 however if they are present they should be inspected.

1855- Log #10 FAE-SCE
(6.3.5.1(9))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(9) ~~Reflective Visibility~~ marking integrity, attachment to garment, reflectivity or damage; when present

Substantiation: The first change corrects the terminology from reflective markings to visibility markings. The second change identifies these should be inspected when present as visibility markings are not mandatory in NFPA 1951.

1855- Log #11 FAE-SCE
(6.3.5.2(6))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(6) Damage to the impact cap; where present

Substantiation: Impact caps are not required per NFPA 1951, however if they are present they should be inspected.

1855- Log #12 FAE-SCE
(6.3.5.2(7))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(7) Damaged or missing ~~reflective~~ visibility markings; when present.

Substantiation: The first change corrects the terminology from reflective markings to visibility markings. The second change identifies these should be inspected when present as visibility markings are not mandatory in NFPA 1951.

1855- Log #13 FAE-SCE
(6.3.5)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

The advanced inspection shall include, as a minimum, the inspections specified in 6.3.5.1 through 6.3.5.7 and for garment elements only the testing specified in ~~Section 12.1~~ and Section 12.2.

Substantiation: Technical rescue garments do not include thermal liners. Therefore the testing specified in Section 12.1 should not apply to these types of garments. There are additional proposals to delete this test from the standard.

1855- Log #14 FAE-SCE
(6.4.3)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Complete liner inspection of all Rescue and Recovery garment elements shall be conducted at a minimum after 3 years in service and annually thereafter or whenever advanced inspections indicate that a problem might exist. ~~The liner system shall be opened to expose all layers~~ The barrier layer shall be exposed for inspection and testing.

Substantiation: Rescue and Recovery Technical Rescue garments do not have liner systems. However it should be clear that the barrier layer should be exposed for the inspection and testing. Additional language may be required for inspection of trilaminate barrier type construction.

1855- Log #15 FAE-SCE
(6.4.5.1(3))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Material physical integrity; UV or chemical degradation as evidenced by discoloration, significant changes in material texture or loss of material strength, ~~loss of liner material, or shifting of liner material.~~

Substantiation: Technical Rescue garments do not have liner systems.

1855- Log #16 FAE-SCE
(7.2.5.3, 7.2.6, 7.2.7, and 7.2.8)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

7.2.5.3 Helmets shall not be machine cleaned or dried using equipment that produces mechanical action from tumbling or agitation.

7.2.6 Additional Requirements for Routine Cleaning of Glove Elements. Glove elements shall not be machine cleaned or dried using equipment that produces mechanical action from tumbling or agitation.

7.2.7 Additional Requirements for Routine Cleaning of Footwear Elements. Footwear elements shall not be machine cleaned or dried using equipment that produces mechanical action from tumbling or agitation.

7.2.8 Additional Requirements for Routine Cleaning of Goggle Elements. Goggle elements shall not be machine cleaned or dried using equipment that produces mechanical action from tumbling or agitation.

Substantiation: These requirements should also include cleaning since this is the cleaning section of the chapter. If this was only intended to relate to drying then these paragraphs should be moved to the drying section of the chapter.

1855- Log #17 FAE-SCE
(7.2.5.1)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

If it is necessary to totally immerse the helmet, the impact cap, where present, shall be separated from the helmet shell. Each element component shall be washed and dried separately before reassembly.

Substantiation: Helmets are not required to have an impact cap, therefore this should apply only when present.

1855- Log #18 FAE-SCE
(8.4.9)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

If replacing ~~trim~~ visibility markings necessitates sewing into a Major A seam, ~~trim~~ visibility markings replacement shall be done only by the garment element manufacturer or by a verified ISP unless the organization is also a verified ISP.

Substantiation: The term trim has been changed to visibility markings.

1855- Log #19 FAE-SCE
(10.1.2)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

10.1.2* Technical rescue protective ensembles and ensemble elements shall be retired in accordance with 10.2.1, ~~no more than 10 years from the date the ensembles or ensemble elements were manufactured.~~ Technical rescue protective ensembles and ensemble elements that have followed the cleaning, inspection and repair requirements of this standard at least annually shall be retired 10 years from the date the ensemble or ensemble element was issued to be worn. Technical rescue ensembles and ensemble elements that have not followed the cleaning, inspection and repair requirements of this standard at least annually shall be retired no more than 10 years from the date the ensembles or ensemble elements date of manufacture.

Substantiation: Ensembles and Ensemble elements that at least annually have been properly cared for, inspected and maintained in accordance with the requirements of this standard should be allowed to be retired more than 10 years after placement in service. By following a program for inspection, care and maintenance as outlined in this standard there is a protocol that has been established for proper review of the ensemble or ensemble element to ensure its continued fitness for use. In the absence of a care and maintenance program then the element should be required to be retired 10 years from the date of manufacture.

1855- Log #20 FAE-SCE
(10.2.1)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Retired technical rescue protective 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.~~

Substantiation: Technical rescue elements are not intended to be used for fire fighting therefore this terminology should be removed.

1855- Log #21 FAE-SCE
(10.2.2(1))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

For training ~~that does not involve live fire~~, provided the ensembles and ensemble elements are appropriately marked as being for non-emergency training only.

Substantiation: Technical rescue elements are not intended to be used for fire fighting therefore this terminology should be removed.

1855- Log #22 FAE-SCE
(11.3.7 and Table 11.3.7(b))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

For verification of an organization's or an ISP's repair services, the following series of tests shall be required for each repair category for which the organization or the ISP is verified. Testing shall be conducted using new materials as outlines in Table 11.3.7 (a) ~~through Table 11.3.7 (c) and Table 11.3.7 (b).~~

Delete existing table 11.3.7 (b) and renumber existing table 11.3.7 (c) as 11.3.7 (b).

Substantiation: Technical rescue garments do not have liners; therefore verification of these components is not required.

1855- Log #23 FAE-SCE
(12.1)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Delete the entire section numbered 12.1 and renumber remaining chapter.

Substantiation: Technical rescue garments do not have liners; therefore the light degradation test is not required for these types of garments.

1855- Log #24 FAE-SCE
(A.4.3.2)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Some ~~departments~~ organizations utilize rental or loaner gear. Records should also be maintained on these ensembles and ensemble elements in order to maintain a history on the care and maintenance of the products. The ~~fire department~~ organization should require that the entity providing the gear provide the records of prior care and maintenance at the time of rental.

Substantiation: Technical rescue garments are used by organizations other than just fire departments, therefore the terminology should be generic to organizations.

1855- Log #25 FAE-SCE
(A.4.5.3)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Extra caution should be practiced to avoid exposing children to soiled protective equipment because they usually are more interested in actually touching or handling the equipment than are adults. Children are also less likely to wash off any dirt ~~or soot~~ that they might pick up from handling ensembles or ensemble elements. ~~Departments~~ Organizations should consider dedicating PPE solely for use at public education events to minimize public exposure to soils and contaminants.

Substantiation: Technical rescue garments are used by organizations other than just fire departments, therefore the terminology should be generic to organizations.

1855- Log #26 FAE-SCE
(A.5.1.5)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: In the last sentence in the next to last paragraph:

This approach allows ~~fire departments~~ organizations to compare prices and product acceptability.

Substantiation: Technical rescue ensembles and ensemble elements apply to more than just fire departments; therefore the terminology used should be more generic.

1855- Log #27 FAE-SCE
(A.5.1.8(1)(b) and (f))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Delete A.5.1.8(1)(b) Lining material and A.5.1.8(1)(f) Wristlets, material, design.

Substantiation: Technical rescue garments so not require the use of lining material and wristlets therefore they should be removed from this list.

1855- Log #28 FAE-SCE
(A.5.1.8(2)(1)(e), (o), and (s))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(e) Any additional ~~liner~~ barrier material requirements

~~(o) Any requirements for spot or localized enhanced insulative performance~~

(s) Any requirements for barrier material substrate ~~or liner~~ fit accessibility to allow field inspection

Substantiation: Technical rescue garments may have a barrier but not a liner so modifications to this list is required.

1855- Log #29 FAE-SCE
(A.5.1.8(2)(2)(f))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(f) Any specific requirements for earflaps (design, materials, dimensions, attachment to shell specifics): if the organization determines ear flaps are required as they are not required in NFPA 1951.

Substantiation: Technical rescue helmets are not required to have ear flaps therefore this item should only apply if the organizations specifies such.

1855- Log #30 FAE-SCE
(A.5.1.8(2)(7)(a))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

(a) Any additional certification requirements (e.g., ~~Project FIRES~~, state OSHA, federal OSHA).

Substantiation: Project FIRES would not apply to Technical rescue PPE.

1855- Log #31 FAE-SCE
(A.6.3.5.1)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: In the second sentence make the following revision:

For example, one side of a multilayer laminate material ~~or quilted material~~ might show damage while the other side might not.

Substantiation: Technical rescue garments do not utilize quilted materials like fire fighting garments do so the language requires revision.

1855- Log #32 FAE-SCE
(A.6.3.5.1(4))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

While all materials and components in garment elements are susceptible to different types of damage from wear or abuse, the barrier material is one of the most difficult parts of the rescue and recovery technical rescue protective (or CBRN technical rescue) garment element to inspect and evaluate. That is because the film or coating side of ~~most the~~ barrier materials faces the ~~interior of the liner~~ outer shell and if sewn around the perimeter and is hidden from easy examination. Even if a garment is equipped with a means of opening ~~shell and barrier the liner~~ to view the film or coating side, it is difficult to conduct a visual evaluation of the barrier material film or coating. Even physical examination of the barrier material film or coating side will not detect all types of damage or defects that can lead to loss of liquid penetration resistance for the garment element.

Substantiation: This language was written to describe fire fighting garments, it requires modification to describe how technical rescue garments are assembled.

1855- Log #33 FAE-SCE
(A.7.1.9)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise the following sentence in this annex item to read:

For example, the tear strength of a material can be measured at a level of ~~11.4kg (25 lb) 35N (7.87lbf)~~ before cleaning and then ~~10kg (22lb) 30N (6.75lbf)~~ after several cycles, whereas a different material could begin at ~~18.2kg (40 lb) 50N (11.24lbf)~~ and drop to ~~11.4kg (25lb) 35N (7.87lbf)~~ after the same number of cleaning cycles.

Substantiation: Modifications in values are proposed to make them more relevant to the pass/fail criteria in NFPA 1951.

1855- Log #34 FAE-SCE
(A.7.3.10.1)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Advanced cleaning includes washing both the inside and outside surfaces of the helmet carefully, using a soft brush to reach between components and into difficult to access spaces, and washing the ~~eye/face protection goggles~~. It is usually not necessary to completely submerge a helmet for cleaning unless it is being inspected for damage or repairs are being performed in conjunction with the cleaning. The helmet should be thoroughly washed prior to disassembly to prevent the migration of dirt and contamination.

Substantiation: Technical rescue helmets use goggles, the term eye/face protection is more applicable to fire fighting helmets.

1855- Log #35 FAE-SCE
(A.8.4.4)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Delete the following text:

~~While some loss of quilting threads on thermal liners is the normal result of wear, excessively large areas where quilt stitching is broken or missing can indicate the need to replace the liner.~~

Substantiation: Technical rescue garments do not use thermal liners; this annex item does not apply to technical rescue garments.

1855- Log #36 FAE-SCE
(A.12.1.1)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Delete this paragraph, the light evaluation should not apply to technical rescue garments as they do not have the type of lining materials this was intended to evaluate.

Substantiation: Technical rescue garments do not use thermal liners; this annex item does not apply to technical rescue garments.

1855- Log #37 FAE-SCE
(Table 4.2.2)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: In the title of the second column of the table change the reference from NFPA 1851 to NFPA 1855.

Substantiation: Incorrect standard reference in the table row heading.

1855- Log #38 FAE-SCE
(Table A.5.1.1)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: This table should be reviewed to determine if all of these hazards apply to technical rescue ensembles and ensemble elements as some are more specific to fire fighting applications.

Substantiation: This table was developed for fire fighting ensembles and ensemble elements, therefore the technical committee should review the table for applicability.

1855- Log #39 FAE-SCE
(Table A.6.2.2 and Table A.6.3.5)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: The technical committee should review these tables for accurateness after revisions are made to the standard to ensure all items are applicable to Technical Rescue PPE and are mandatory components of PPE. The tables should be revised to correct any inconsistencies.

Substantiation: There currently are omissions and errors in the tables based on the current requirements of the draft document. In addition there will be revisions to the requirements in the document during the ROP meeting. Therefore the tables should be reviewed and updated accordingly after all changes are made.

1855- Log #40 FAE-SCE
(A.7.1.1(5))

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: Revise text to read as follows:

Helmet shells, ~~helmet faceshields~~ or goggles can pit or craze.

Substantiation: Technical rescue helmets do not require face shields.

1855- Log #41 FAE-SCE
(A.7.3.2)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: In the second paragraph, revise as follows:

Soiling is not always visible and can be difficult to observe on a darkly colored materials. ~~In addition, exposure can occur where ensemble elements are contaminated with fire gasses, resulting in ensemble elements that can be relatively unsafe for use. Ensemble elements that have not been cleaned and appear to be unsoiled have been shown to contain numerous fire gas chemicals, including carcinogenic polynuclear aromatic compounds.~~ Periodic cleaning is required to avoid use of ensemble elements that could be contaminated without visible evidence of soiling.

Substantiation: These requirements are more applicable to structural fire fighting ensembles and not technical rescue garments.

1855- Log #42
(Entire Document)

Final Action:

Submitter: Karen E. Lehtonen, Lion

Recommendation: The entire document related to garments should be reviewed to review consistency in terminology between this document and NFPA 1951. Specifically the terminology for the barrier layer and liners should be reviewed. This terminology should also incorporate the possibility of trilaminate technology for rescue and recovery or CBRN garments as this could be utilized in technical rescue garments. _

Substantiation: Not all terminology between NFPA 1855 and NFPA 1951 is consistent. This could lead to issues in the field when determining what is being evaluated by an organization or ISP. The terminology should be standardized between both standards for clarity purposes.

1855- Log #43 FAE-SCE
(6.3.4)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: The findings of the advanced inspection shall be documented on an inspection form.

Add: This form may be paper, electronic or any type of permanent record.

Substantiation: The statement causes the user to assume they must use a paper form.

1855- Log #44 FAE-SCE
(6.2.2.4(c))

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: Exposed or deformed steel toe, steel midsole, or shank.

New / Exposed or deformed protective toe, protective midsole, or shank.

Substantiation: The document assumes that boots will always use steel to protect the toe and midsole. The standard should allow for other technologies that may replace steel.

1855- Log #45 FAE-SCE
(Table A.10.1.4)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: The chart indicates Amount Allowed per Set. It should read Amount Allowed per Garment.

Amount of Original Cost column %s should be adjusted to allow for higher repair cost. %s should be adjusted to 90%, 70% and 60% for the first three years respectively.

Substantiation: The word set was incorrectly used and should have referred to garment.

The existing % matrix would condemn garments after the first year of use if the moisture barrier required replacement. Raising the % figures would allow for moisture barrier replacement without condemning the garment.

1855- Log #46 FAE-SCE
(A.6.1.2)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: When inspecting elements for soiling consideration should be given to the accumulation of dirt, mud or other grime that could cause degradation of the element. Perspiration and its remains could also degrade the element or components of the element and should be considered when evaluating for soiling.

Substantiation: The definition of soiling is generic and does specifically call out everyday soiling that should be considered when evaluating PPE elements. This comment adds appendix language to more clearly define and illustrate what should be considered when evaluating the element.

1855- Log #47 FAE-SCE
(7.3.7(10))

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: 7.3.7(10)

ADD – Cleaning and soaking agents shall not leave any residue or cause any degrading of the ensemble or ensemble elements.

Substantiation: Preliminary testing of some products show a residue after cleaning. This issue is of particular concern with the moisture barrier. It appears that this residue can cause premature seam tape failures.

1855- Log #48 FAE-SCE
(6.3.5.6)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: Add new text to read as follows:

Label integrity and legibility.

Substantiation: Label integrity and legibility is required for record keeping.

1855- Log #49 FAE-SCE
(6.3.5.5)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: Add new text to read as follows:

Label integrity and legibility.

Substantiation: Label integrity and legibility is required for record keeping.

1855- Log #50 FAE-SCE
(6.3.5.4)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: Add new text to read as follows:

Label integrity and legibility.

Substantiation: Label integrity and legibility is required for record keeping.

1855- Log #51 FAE-SCE
(6.3.5.3)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: Add new text to read as follows:

Label integrity and legibility.

Substantiation: Label integrity and legibility is required for record keeping.

1855- Log #52 FAE-SCE
(6.3.5.2)

Final Action:

Submitter: James M. Baker, TotalCare

Recommendation: Add new text to read as follows:

Label integrity and legibility.

Substantiation: Label integrity and legibility is required for record keeping.

1855- Log #53 FAE-SCE
(A.7.3.7 (New))

Final Action:

Submitter: Daniel J. Gohlke, W. L. Gore and Associates

Recommendation: Add new text to read as follows:

A.7.3.7 Washing and drying should be conducted to be as little physically damaging as possible. Precautions, such as removing hardware and tools from pockets, separating shells from liners, closing all closures, laundering in a laundry bag, etc., are all designed to reduce physical damage. Hard heavy accessories (e.g. harnesses, carabineers) and findings (e.g. D-rings) beating on the garments against the washer and dryer drums can be very damaging to garments, especially barriers. Any and all precautions should be taken to avoid this source of damage.

Substantiation: This is valuable advice.

1855- Log #54 FAE-SCE
(6.4 and 12.2)

Final Action:

Submitter: Daniel J. Gohlke, W. L. Gore and Associates

Recommendation: Delete Section 2.1.

Move Section 12.2 to Section 12.1.

Move Section 6.4 to Section 12.2.

Delete Section 6.4.3 (now Section 12.2.3).

Section 12.2.5.2 (now Section 12.1.5.2) change "evaluated per Section 6.4" to evaluated per Section 12.2".

Substantiation: This makes the sequencing of advanced inspection, puddle test, complete barrier inspection, hydrostatic test, replace or repair much easier to follow.

1855- Log #55 FAE-SCE
(6.5.4.2, 12.3.5.1, and 12.3.5.2)

Final Action:

Submitter: Daniel J. Gohlke, W. L. Gore and Associates

Recommendation: 6.4.5.2 delete "and shall show no leakage"

New 12.3.5.1 Barrier materials and seams shall be repaired or replaced if discrete droplets appear in all (6) test sites, or if discrete droplets appear in 4 or more locations within any one test site, or if water flows continuously in any test site.

New 12.3.5.2 After testing the liner shall be allowed to dry completely before repairing if needed, and before returning to service.

Substantiation: The criteria in NFPA 1971 for determining whether a moisture barrier needs to be repaired or replaced has led to unnecessary repairs and replacements of moisture barriers. This proposition is evidenced by many fire departments spending lots of money on repairs and replacements to garments which are performing satisfactorily and effectively in the field. Some departments have chosen not to implement NFPA 1851 in whole or in part because of this discrepancy.

The integrity of NFPA 1971 garments and NFPA 1951 garments is controlled by the shower test. Not all leaks are found by the shower test. So a no leak strategy for NFPA 1851 and 1855 for the maintenance of NFPA 1971 and NFPA 1951 garments is overkill, is inconsistent with the product performance requirements of the respective product standard.

There are many possible modifications to the inspection regime for finding leaks that would reduce the level of scrutiny. This proposal suggests that the criterion for implementing repairs be graded, so that serious flaws and failures (continuous flow, or many discrete droplets) get repaired, but that small leaks (few discrete droplets) are discounted.

1855- Log #56 FAE-SCE
(4.2.5)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

Where the organization performs its own advanced inspection, advanced cleaning or basic repair, the organization shall be trained by the ensemble or ensemble element manufacturer, a Verified ISP or an ISP. Where the organization uses an ISP to perform advanced inspection, ~~or~~ advanced cleaning or basic repair, the ISP shall be trained by the ensemble or ensemble element manufacturer.

Substantiation: The standard creates two categories of Independent Service Provider (ISP) - Verified ISP and ISP. A Verified ISP has annual testing of repairs, facility inspection and their Quality Manual audited to verify continued compliance of all services provided. An ISP has not been evaluated for compliance to the standard; therefore should be trained by the manufacturer to perform these services and to train organizations to perform them. Manufacturer training should not be required by Verified ISPs.

1855- Log #57 FAE-SCE
(6.3.1)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

Advanced inspection and any necessary testing shall be performed by a verified ISP, ISP, or the organization's trained personnel.

Substantiation: The standard must clearly differentiate between an ISP and a verified ISP, and the fact that ISPs which are under no scrutiny must have manufacturers' training to perform advanced inspection and to train organizations on advanced inspection. Verified ISPs on the other hand have chose to invest in developing NFPA 1851 compliant processes and have chosen to have these processes scrutinized and deemed acceptable by a third party certification organization.

1855- Log #58 FAE-SCE
(7.3.1)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

Advanced cleaning and any necessary testing shall be performed by a verified ISP, ISP, or the organization's trained personnel.

Substantiation: The standard must clearly differentiate between an ISP and a verified ISP, and the fact that ISPs which are under no scrutiny must have manufacturers' training to perform advanced cleaning and to train organizations on advanced cleaning. Verified ISPs on the other hand have chosen to invest in developing NFPA 1851 complaint processes and have chosen to have these processes scrutinized and deemed acceptable by a third party certification organization.

1855- Log #59 FAE-SCE
(7.3.7)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: The following procedures shall be used for machine washing:

- (1)* The machine shall not be overloaded.
- (2)* Heavily soiled or spotted areas shall be pretreated. Chlorine bleach, chlorinated solvents, active-ingredient cleaning agents, or solvents shall not be used without the ensemble or ensemble element manufacturer's approval.
- (3) All closures, including pocket closures, hooks and loops, snaps, zippers, and hooks and dees shall be fastened.
- (4) All garments should be placed into a mesh laundry bag for machine cleaning.
- ~~(4)*~~ (5)* Water temperature shall not exceed 40°C (105°F).
- ~~(5)*~~ (6) A mild detergent with a pH range of not less than 6.0 pH and not greater than 10.5 pH as indicated on the product MSDS or original product container shall be used.
- ~~(6)*~~ (7)* Washing machines with the capability of drum RPM adjustment shall be adjusted so the g-force does not exceed 100 g for all elements.
- ~~(7)*~~ (8) Machine manufacturer's instructions shall be followed for proper setting or program selection for the specific element being washed.
- ~~(8)*~~ (9) The element shall be inspected and rewashed if necessary.
- ~~(9)*~~ (10)* Where the machine is also used to wash items other than protective ensemble, it shall be rinsed out by running the machine without a laundry load through a complete cycle with detergent and filled to the maximum level with water at a temperature of 49°C to 52°C (120°F to 125°F).

Substantiation: Garments should be placed in a mesh laundry bag for machine cleaning so the moisture barrier, which is not sandwiched between other materials, is not damaged by rough spots, burns, or sharp edges that could be present in the drum of the washer-extractor.

1855- Log #60 FAE-SCE
(8.1.1)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

All repairs shall be performed by the original manufacturer, a Verified ISP, an ISP, or a member of the organization who has received training by a manufacturer, a Verified ISP, or ~~by~~ an ISP in the repair of ensemble or ensemble elements.

Substantiation: The standard must clearly differentiate between an ISP and a verified ISP, and the fact that ISPs which are under no scrutiny must have manufacturers' training to perform basic repairs and to train organizations on basic repairs. Verified ISPs on the other hand have chosen to invest in developing NFPA 1851 compliant processes and have chosen to have these processes scrutinized and deemed acceptable by a third party certification organization.

1855- Log #61 FAE-SCE
(A.6.3.2.1)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

For any inspection program to be effective, ensembles and ensemble elements should be evaluated by trained individuals. The individuals evaluating the ensembles and ensemble elements should understand the limitations of each element and recognize the signs of failure. Utilizing trained individuals provides consistency on whether an item should be repaired or retired. The manufacturer, verified ISP or ISP and organization should determine the level of training required to perform advanced inspections. Resources for training that should be considered, as a minimum, are the manufacturer(s) of the elements in use, the Fire and Emergency Manufacturers and Services Association (FEMSA) user guides; NFPA 1500, *Standard on fire Department Occupational Safety and Health Program*, and professional cleaning and repair facilities.

Substantiation: Adding verified ISP or ISP makes A.6.3.2.1 consistent with line 4.2.5 reference to ISP, and our proposal for 4.2.5 to differentiate between ISP and verified ISP.

1855- Log #62 FAE-SCE
(A.7.3.6)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

Machine cleaning is the most effective method for cleaning ensemble elements such as coats, trousers, coveralls, and hoods. It is the most effective means of loosening and removing dirt, soot, and other debris. Presently there are two basic types of automatic washing machines ~~are~~ commonly available for use by end-users: top-loading agitator style machines and front-loading washer/extractors. New technologies are emerging every day in the cleaning industry that will affect options available to both the end-user as well as the ISP for all ensemble elements. At this time, it is generally accepted that front-loading machines are more appropriate for protective ensemble and ensemble elements, where allowed by the element manufacturer.

Substantiation: There are several new technologies that are close to being brought to market that may not use washing machines and could theoretically clean all ensemble elements. Although the standard does mention "emerging technologies: it implies these technologies are applicable to machine washing of fabric elements. If new cleaning technology that is proven effective and safe for all elements is introduced, the standard should contain language that would make it eligible for compliance.

1855- Log #63 FAE-SCE
(A.7.3.6)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

Top-Loading Washers. Top-loading machines are similar to those used in most homes. They use a center post agitator to whisk water through the fibers of garments. They are designed to clean multiple garments of minimum bulk. As a result of the center post agitation, it is generally accepted that top-loading machines are more damaging to ensembles and ensemble elements than front-loading machines. Top-loading, agitating machines have the potential to reduce the longevity of garments due to mechanical damage. If top-loading machine are used, stainless steel wash tubs free of rough spots, burrs, or sharp edges are recommended to protect against rusting, chipping, snags and the associated wear on and damage of garments.

Front-Loading Washers. Front-loading washers have a door on the front of the machine through which garments are loaded. They clean by lifting garments out of the water and gently dropping them back into the water. These units provide better mechanical action because of the size and type of rotation, as well as the degree of extraction. They have various capacities and are designed to handle heavy loads of bulky items and also to save water and energy. For those reasons, it is generally accepted that front-loading machines are more appropriate for protective clothing. If front-loading machines are used, stainless steel wash tubs free of rough spots, burrs, or sharp edges are recommended to protect against rusting, chipping, snags and the associated wear on and damage of garments.

Substantiation: The moisture barrier is relatively unprotected in most technical rescue garments; therefore exposure to rough or sharp surfaces could damage it during mechanical cleaning.

1855- Log #64 FAE-SCE
(6.3.2.1)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

The ensemble or ensemble element manufacturer or, a verified ISP or an ISP and the organization shall determine the level of training required to perform advanced inspection. The ensemble or ensemble element manufacturer or, a verified ISP or an ISP shall provide written verification of training.

Substantiation: The standard must clearly differentiate between an ISP and a verified ISP. On services that both are able to provide, they should be noted separately in order to provide consistency throughout the standard.

1855- Log #65 FAE-SCE
(6.4.1)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

Complete liner inspection of all rescue and recovery technical rescue garments and CBRN technical rescue garment elements shall be performed by a verified ISP, ISP or the organization's trained personnel.

Substantiation: The standard must clearly differentiate between an ISP and a verified ISP. On services that both are able to provide, they should be noted separately in order to provide consistency throughout the standard.

1855- Log #66 FAE-SCE
(6.4.2.1)

Final Action:

Submitter: Vicki Smith, LION Apparel

Recommendation: Revise text to read as follows:

The garment element manufacture σ , a verified ISP or ISP and the organization shall determine the level of training required to perform complete liner inspections. The garment element manufacturer σ , verified ISP or ISP shall provide written verification of training.

Substantiation: The standard must clearly differentiate between an ISP and a verified ISP. On services that both are able to provide, they should be noted separately in order to provide consistency throughout the standard.