Report of the Committee on Fire and Emergency Services Protective Clothing and Equipment

Richard M. Duffy, *Chair*
International Association of Fire Fighters, DC [L]
Rep. International Association of Fire Fighters

William M. Lambert, *Secretary*
Mine Safety Appliances Company, PA [M]
Rep. Compressed Gas Association

Leslie Anderson, USDA Forest Service, MT [E]
Roger L. Barker, North Carolina State University, NC [SE]
Nicholas J. Curtis, Lion Apparel, Inc., OH [M]
Robert A. Freese, Globe Manufacturing Company, NH [M]
Andy Gbur, Intertek, OH [RT]
Bill Grilliot, Morning Pride Manufacturing, LLC, OH [M]
Rep. Fire and Emergency Manufacturers and Services Association Inc.
William E. Haskell, III, Battelle Memorial Institute, MA [RT]
Virgil Hathaway, San Diego Fire Department, CA [U]
Rep. Southern Area Fire Equipment Research
Kimberly M. Henry, Celanese Advanced Materials Inc., NC [M]
James S. Johnson, Lawrence Livermore National Laboratory, CA [RT]
Cy Long, Texas Commission on Fire Protection, TX [E]
David G. Matthews, Fire & Industrial (P.P.E) Ltd., England [SE]
Richard W. Metzler, US Department of Health & Human Services, PA [RT]
Jim Minx, Oklahoma State Firefighters Association, OK [C]
Rep. Oklahoma State Firefighters Association
Stephen R. Sanders, Safety Equipment Institute (SEI), VA [RT]
Denise N. Statham, Southern Mills, Inc., GA [M]
Jeffrey O. Stull, International Personnel Protection, Inc., TX [SE]
David Trivette, Tyco/Scott Health & Safety, NC [M]
Rep. International Safety Equipment Association
Robert D. Tutterow, Jr., Charlotte Fire Department, NC [U]
Rep. Fire Industry Equipment Research Organization
Harry P. Winer, US Department of the Navy, MA [RT]
Thomas L. Wollan, Underwriters Laboratories Inc., NC [RT]

Alternates

Richard W. Blocker, Jr., The DuPont Company, VA [M]
(Alt. to Kimberly M. Henry)
Leslie F. Boord, US Department of Health & Human Services, PA [RT]
(Alt. to Richard W. Metzler)
Janice C. Bradley, International Safety Equipment Association, VA [M]
(Alt. to David Trivette)
Steven D. Corrado, Underwriters Laboratories Inc., NC [RT]
(Alt. to Thomas L. Wollan)
Patricia A. Freeman, Globe Manufacturing Company, NH [M]
(Alt. to Robert A. Freese)
Patricia A. Gleason, Safety Equipment Institute (SEI), VA [RT]
(Alt. to Stephen R. Sanders)
Mary I. Grilliot, TFG/Morning Pride Manufacturing LLC, OH [M]
(Alt. to Bill Grilliot)
Steven B. Lumry, Oklahoma City Fire Department, OK [C]
(Alt. to Jim Minx)
Frank P. Taylor, Lion Apparel, Inc., VA [M]
(Alt. to Nicholas J. Curtis)

Nonvoting

Donna P. Brehm, Virginia Beach Fire Department, VA [U]
Rep. TC on Emergency Medical Services PC&E
Don R. Forrest, United Firefighters of Los Angeles City, CA [L]
Rep. TC on Special Operations PC&E
George M. Jackson, USDA Forest Service, MT [E]
Rep. TC on Wildland Fire Fighting PC&E
Glenn P. Jirka, Miami Township Fire & EMS Division, OH [E]
Rep. TC on Hazardous Materials PC&E
Kirk Owen, Plano Fire Department, TX [U]
Rep. TC on Structural and Proximity Fire Fighting PC&E
Ray F. Reed, Dallas Fire Department, TX [U]
Rep. TC on Respiratory Protection Equipment
Bruce H. Varner, Santa Rosa Fire Department, CA [E]
Rep. TC on Electronic Safety Equipment

Staff Liaison**: Bruce W. Teele**

Committee Scope: This Committee shall have primary responsibility for documents on the design, performance, testing, and certification of protective clothing and protective equipment manufactured for fire and emergency services organizations and personnel, to protect against exposures encountered during emergency incident operations. This Committee shall also have the primary responsibility for documents on the selection, care, and maintenance of such protective clothing and protective equipment by fire and emergency services organizations and personnel.

Report of the Committee on Hazardous Materials Protective Clothing and Equipment

Glenn P. Jirka, *Chair*
Miami Township Fire & EMS Division, OH [E] Rep. The InterAgency Board

Patricia A. Gleason, *Secretary*
Safety Equipment Institute (SEI), VA [RT]

William Alexander, Onguard Industries, MD [M]
Jeffrey B. Borkowski, Fire Department, City of New York, NY [U]
Steven D. Corrado, Underwriters Laboratories Inc., NC [RT]
Steven M. De Lisi, Virginia Air National Guard, VA [U]
Wade G. DeHate, Hillsborough County Fire Rescue, FL [E]
Jan Dunbar, El Dorado Hills, CA [E]
Rep. International Association of Fire Chiefs
Daniel Gohlke, W. L. Gore & Associates, MD [M]
Kevin W. Klamser, US Navy Coastal Systems Station, FL [RT]
Brett LaFrance, Intertek-ETL Semko, NY [RT]
Karen E. Lehtonen , Lion Apparel, Inc., OH [M]
Trudy J. Lewis, Battelle Memorial Institute, OH [RT]
Ulf Nystrom, Trelleborg Protective Products AB, Sweden [M]
Louis V. Ott, Gentex Corporation, PA [M]
Rep. International Safety Equipment Association
Kenneth A. Pever, Guardian Manufacturing Company, OH [M]
Mel Seng, TFG/Norcross Safety Products, IL [M]
Jeffrey O. Stull, International Personnel Protection, Inc., TX [SE]
Jonathan V. Szalajda, US Department of Health & Human Services, PA [E]
Robert West, Texas Instruments, TX [U]
James P. Zeigler, DuPont Personal Protection, VA [M]
Michael Ziskin, Field Safety Corporation, CT [RT]

Alternates

Dale Gregory Beggs, Texas Instruments, TX [U]
(Alt. to Robert West)
Nicholas J. Curtis, Lion Apparel, Inc., OH [M]
(Alt. to Karen E. Lehtonen)
Andy Gbur, Intertek, OH [RT]
(Alt. to Brett LaFrance)
Russell R. Greene, Battelle Memorial Institute, OH [RT]
(Alt. to Trudy J. Lewis)
A. Ira Harkness, US Department of the Navy, FL [RT]
(Alt. to Kevin W. Klamser)
Thomas M. Pease, Gentex Corporation, PA [M]
(Alt. to Louis V. Ott)
John Reilly, Total Fire Group, OH [M]
(Alt. to Mel Seng)
Angie M. Shepherd , Underwriters Laboratories Inc., NC [RT]
(Alt. to Steven D. Corrado)

Staff Liaison: **Bruce W. Teele**

Committee Scope: This Committee shall have primary responsibility for documents on protective clothing and protective equipment, except respiratory protective equipment, that provides hand, foot, torso, limb, and head protection for fire fighters and other emergency services responders during incidents that involve hazardous materials operations. These operations involve the activities of rescue; hazardous material confinement, containment, and mitigation; and property conservation where exposure to substances that present an unusual danger to responders are present or could occur due to toxicity, chemical reactivity, decomposition, corrosiveness, or similar reactions.
Additionally, this committee shall have primary responsibility for documents on the selection, care, and maintenance of hazardous materials protective clothing and protective equipment by fire and emergency services organizations and personnel.

Report of the Committee on
Wildland Fire Fighting Protective Clothing and Equipment

Committee Scope: This Committee shall have primary responsibility for documents on protective clothing and protective equipment, except respiratory protective equipment, that provides hand, foot, torso, limb and head protection, as well as interface protection for fire fighters or other emergency services responders during incidents involving wildland fire fighting operations. These operations include the activities of fire suppression and property conservation in forest, brush, grass, ground cover, and other such vegetation that is not within structures but that is involved in fire.
Additionally, this committee shall have primary responsibility for documents on the selection, care, and maintenance of wildland fire fighting protective clothing and protective equipment by fire and emergency services organizations and personnel.

These lists represent the membership at the time each Committee was balloted on the text of this report. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of the document.

The Committee on **Fire and Emergency Services Protective Clothing and Equipment** is presenting four Reports for adoption, as follows:

The Reports were prepared by the:

- Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment (FAE-ACC)
- Technical Committee on Hazardous Materials Protective Clothing and Equipment (FAE-HAZ)
- Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment (FAE-WFF)

Report I of this Report on Comments was prepared by the **Technical Committee on Hazardous Materials Protective Clothing and Equipment,** and documents its action on the comments received on its Report on Proposals on NFPA 1991, **Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies,** 2000 edition, as published in the Report on Proposals for the 2004 November Meeting.

NFPA 1991 has been submitted to letter ballot of the **Technical Committee on Hazardous Materials Protective Clothing and Equipment,** which consists of 22 voting members; of whom 15 voted affirmatively, and 7 ballots were not returned (Borkowski, De Lisi, De Hate, Dunbar, Pever, Ziegler, Ziskin).

Mr. Stull voted affirmatively with this comment:
1991-61, Log #65, Page 30: I have voted affirmative on the standard and believe that a substantial improvement has been made as part of a strategy for realigning NFPA 1991 and NFPA 1994 to provide more practical and appropriately based requirements. In this edition, the Class 1 requirements from NFPA 1994 have been moved to NFPA 1991 by making what was once the optional chemical and biological terrorism requirements mandatory. The result is a product that will deliver the upper end of protection to specialized response teams against a variety of vapor, liquid, and particulate hazards, including those that occur during terrorism agents.

Regardless of the improvements that have been made in NFPA 1991, it is my opinion that there is one gnawing problem within the standard, which has manifested itself because of certain organizations within the protective clothing industry have seized the opportunity to justify their existence at incredible cost to the end user community. The specific problem is the continued use of actual chemical warfare agents in the testing and qualification of chemical protective clothing. Chemical warfare agent testing that is both tremendously expensive and can be relatively inaccessible to manufacturers of chemical protective clothing. I have recommended the use of simulants for these chemicals to help encourage industry into further compliance with a broader offering of products. The efforts of the Interagency Board and the recent Presidential Homeland Security Directive mandating use of products that comply with national standards have helped, but I feel that particularly in the case of NFPA 1991, where ensemble materials must already demonstrate an exceedingly high level of barrier performance, the use of simulants is clearly appropriate and justified.

Consider that that chemical agents now specified in NFPA 1991, distilled mustard and sarin, have their origin in the World War I era nearly 85 years ago. The chemistry of these agents is well known and their permeation characteristics for plastic film and rubber based materials are well established. Specific simulants, 2-Chloroethyl Ethyl Sulfide for distilled mustard and Diisopropylmethylphosphonate for sarin, have been used for used for screening material performance prior to actual agent testing. As these specific simulants are slightly smaller in size, but yet have the same chemistry, they in fact can permeate even more aggressively than the actual agents. The use of simulants is no different than the practice that we employ in other standards, namely the use of Bacteriophage Phi-X174 as a surrogate or simulant for HIV and Hepatitis B virus for determining the penetration resistance of barrier materials. Certainly, there are those who feel that we have test the “real” thing in order to be assured that the demonstrated performance exists when needed, but we have already based industry testing for deadly bloodborne hazards on a testing model involving a surrogate.

Perhaps the most compelling argument for the acceptance of using surrogates in testing NFPA 1991 ensemble materials comes from an understanding of the overall barrier performance, which has always been required as part of the standard. Each material used in the ensemble, including the base garment material, seams, visor material, visor seams, gloves and footwear are tested to 21 different chemical representing a range of industrial chemicals. This testing is done with the chemical at 100% contact with the material over duration of exposure and no chemical can show breakthrough within 1 hour since the beginning of the chemical exposure. Garment, glove, and visor materials are further subjected to abrasion and repeated flexing prior to permeation testing. Granted that the 21 chemicals, while dangerous, are no where near as toxic as sarin or mustard, these chemicals are significantly smaller and more aggressive in terms of their permeation characteristics. Chemicals such as carbon disulfide (molecular weight = 76), dichloromethane (molecular weight = 85), and tetrahydrofuran (molecular weight = 72) will more readily permeate materials than the bulky large molecules represented by the chemical warfare agents (sarin MW = 140; mustard MW = 137). Any material that demonstrates permeation resistance to the 21-chemical battery per the NFPA 1991 requirements has no problem with any of the chemical agents.

I believe that if the committee were to substitute 2-Chloroethyl Ethyl Sulfide for distilled mustard and Diisopropylmethylphosphonate for sarin in the requirements for permeation testing that there would be absolutely no decrease in the health and safety levels for first responders using products that comply with the requirements of NFPA 1991, and that instead, there would be immediate benefits to industry in more efficient and cost-effective testing that will encourage the development of a larger number of choices for the end user community. The committee should not be dissuaded by statements from certain organizations that they are working on the problem (of defining simulants) or that the issue is more complex than it seems. These groups have had a sufficiently long enough time to work on this problem and should be ashamed

of their progress towards resolving such matters. The industry needs to advance and this change offers that opportunity.

NFPA 1991 has also been submitted to letter ballot of the **Technical Correlating Committee on Fire Emergency Services Protective Clothing Equipment,** which consists of 23 voting members of whom 15 voted affirmatively, and 8 ballots were not returned (Anderson, Lambert, Hathaway, Johnson, Long, Saunders, Stull, Trivette).

Report II of this Report on Comments was prepared by the **Technical Committee on Hazardous Materials Protective Clothing and Equipment,** and documents its action on the comments received on its Report on Proposals on NFPA 1992, **Standard on Liquid Splash-Protective Clothing and Equipment for Wildland Fire Fighting,** 2000 edition, as published in the Report on Proposals for the 2004 November Meeting.

NFPA 1992 has been submitted to letter ballot of the **Technical Committee on Hazardous Materials Protective Clothing and Equipment,** which consists of 22 voting members; of whom 16 voted affirmatively, and 6 ballots were not returned (Borkowski, De Lisi, De Hate, Dunbar, Pever, Ziskin).

NFPA 1992 has also been submitted to letter ballot of the **Technical Correlating Committee on Fire Emergency Services Protective Clothing and Equipment**, which consists of 23 voting members of whom 15 voted affirmatively, and 8 ballots were not returned (Anderson, Lambert, Long Saunders, Hathaway, Johnson, Stull, Trivette).

Report III of this Report on Comments was prepared by the **Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment** and documents its action on the comments received on its Report on Proposals on NFPA 1977, **Standard on Protective Clothing and Equipment for Wildland Fire Fighting,** 1998 edition, as published in the Report on Proposals for the 2004 November Meeting.

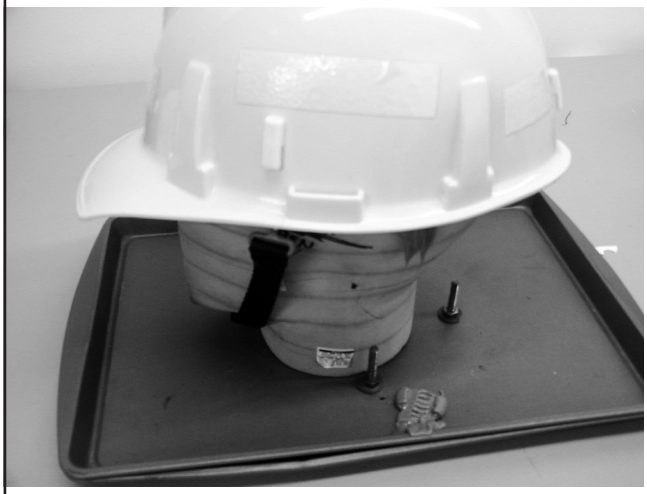
NFPA 1977 has been submitted to letter ballot of the **Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment,** which consists of 20 voting members; of whom 14 voted affirmatively, 1 negatively after circulation of negative ballots (Stull), and 5 ballots were not returned (Ackerman, Corner, Craven, J. Olsen, Wood).

Mr. Stull voted negatively stating:
1977-119, (Log #11, Pag3 58: Shame on the committee for reversing its direction during its ROC meeting for apparent product protectionism. The action taken on this comment is unacceptable. It is uncertain how the specific text originated, but clearly language that permits the protection the helmet suspension, particularly in view of the relative innocuous exposure temperature of 350°F, has no place in the standard. Certainly one would think that the portion of the helmet that contacts the wearer's head should not readily melt under the specified oven heat exposure conditions. If the committee simply wants a hardhat for wildland fire fighters, remove the requirements for wildland fire fighting helmets altogether from the standard and specify hardhats that meet ANSI Z89.1 in NFPA 1500.
The submitters proposal to remove the clause that permits protecting the suspension further points to a deficiency in the NFPA 1977 ROP, in which no criteria are applied to the whole helmet other than deformation of the brim or peak. Paragraph 7.2.5 should also further specify that the helmet suspension shall not melt.
1977-106 (Log #62), Page 53: The action on the subject log is incorrect. At the meeting, the committee agreed to specify the heat conditioning of trim at a test temperature of 260°C. The action on this comment is inconsistent with the action taken on 1977-105 (Log #29), Page 52.
1977-65 (Log #118), Page 32; 1977-66 (Log #165) Page 32; and 1977-67 (Log #176) Page 33: I do not agree with the actions of the committee to reduce the total heat loss proposed in the ROP at 550 W/m^2 to 450 W/m^2. The committee failed to consider that the 1998 edition, while requiring a total heat loss of 450 W/m^2, had these measurements conducted after 5 cycles of laundering. It is well known that laundering causes a decline of total heat loss for a material system. Therefore, by now moving back to a requirement of 450 W/m^2 without laundering preconditioning, the committee is effectively reducing the overall breathability of garments as afforded to wildland fire fighters.
It is implausible that barrier clothing such as that specified in NFPA 1951 and NFPA 1999 must meet a total heat loss requirement of 450 W/m^2 while single layer clothing, which is typically used over longer wearing periods, is expected to meet the same level of performance.

NFPA 1977 has also been submitted to letter ballot of the **Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment,** which consists of 23 voting members of whom 13 voted affirmatively, 2 negatively (Grilliot, Stull), 1 abstained (Winer), and 7 ballots were not returned (Anderson, Lambert, Hathaway, Johnson, Long, Sanders, Trivette).

Mr. Stull voted negatively stating:
The proposed 2005 Edition of NFPA 1977, through both the ROP draft and the handling of ROC, contains a serious safety hazard that should have been corrected at the recent TCC meeting. Helmet suspensions should be properly tested for heat resistance and should not melt under the conditions of the current test procedures. If not addressed in this ROC the issue must be brought before the Standard Council.

Mr. Grilliot voted negatively stating:
I reviewed Mr. Stull's negative ballot and checked with our lab regarding this issue. Most of the NFPA 1977 helmet suspensions we tested did indeed achieve a passing review. However, there was one NFPA 1977 helmet suspension that, in our opinion did not. After reviewing the test procedure, its limited exposure challenge, and outcome of one candidate helmet, I must agree with Mr. Stull and I wish to change my vote to a negative.



Mr. Winer abstained stating:
I feel that the actions taken by the Technical Correlating Committee on the logs were technical changes and if these changes were necessary the standard should have been sent back to committee for reconsideration. Technical changes should only be made by the Technical Committees only.

Mr. Matthews voted affirmatively with this comment stating:
In line with 2 resolutions covered by the Technical Correlating Committee on the 21/6/04.

Mr. Metzler voted affirmatively with comment stating:
Affirmative vote is affirmatively with the understanding that the two Technical Correlating Committee motions made and approved apply with appropriate Technical Committee action.

1977-1 Log #101 FAE-WFF **Final Action: Accept**
(Entire Document)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
7.6.2 Goggles shall be tested for optical clarity
8.1.4.6 The radiant heat transducer shown in Figure 8.1.4.6 shall be constructed from sheet copper, as specified in ASTM...
8.4.11.5 A series of points shall be marked 75 mm (3 in.) apart on the outer edge of the peak or brim of the sample helmets, allowing at least three points on a peak and eight ~~of~~ or more points on a full brim.
8.13.5.1.2 Any point with in 100 mm...
8.19.7 ~~Criteria~~ Interpretation
8.21.4.4 The first word in the third line should be overlay not overlap.
8.21.5.1 The word time in the last line is misspelled tme.
8.25.5.3 Test subjects shall be selected such that their hand dimensions are as close as possible...
8.29.6.1 In the fourth line it should say "the eylet or the stud post" not "the eyelet of the stud post".
8.32.4.2.1(2) the standard abrasive fabric shall be rewetted after each set of cycles ~~of~~ by applying...
A.1.2.2 should be A.1.2.3.
A.1.3.3 should say "See A.1.1.3".
A.3.2.4 should be A.3.2.2.
A.3.3.72.2 should be A.3.3.74.2.
A.3.3.72.3 should be A.3.3.74.3.
A.4.1.4 should A.4.1.7.
A.4.2.3 should be A.4.2.5.
A.4.2.4 should be A.4.2.6.
A.4.2.7 should be A.4.2.9.
A.4.2.9 should be A.4.2.7.1.
A.4.6 should A.4.5.
A.5.1.1.4 should say "See A.4.1.7".
A.5.2.1.4 should say "See A.4.1.7".
A.5.3.1.4 should say "See A.4.1.7".
A.5.4.1.4 should say "See A.4.1.7".
A.5.5.1.4 should say "See A.4.1.7".
A.5.6.2.4 should be A.5.6.1.4 and should say "See A.4.1.7".
A.5.7.3.4 should be A.5.7.1.4 and should say "See A.4.1.7".
A.5.8.1.4 should say "See A.4.1.7".
A.6.5.2 should be A.6.4.2.
A.6.5.9.1 should be A.6.4.9.1.
A.6.6.6 should be A.6.5.3.
A.6.7 should be A.6.8.
A.7.2.1 should be A.7.1.6
A.8.1.4.8 should be A.8.1.4.10.
Delete A.7.3.1.
Delete A.8.5.5.12.
Delete A.8.5.5.15.
Delete A.8.22.
Delete A.8.30.3.7.
Substantiation: Editorial changes.
Committee Meeting Action: Accept

1977-2 Log #43e FAE-WFF **Final Action: Accept**
(Entire Document)

Submitter: Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment
Comment on Proposal No: 1977-2
Recommendation: The TCC directs the TC to review the ANSI Z89.1, 2003 edition edition with the helmet requirements in the NFPA 1977 ROP and resolve any differences between the two documents.
Substantiation: The TCC desires that the two standards be compatible where possible and if the ANSI Z89.1 could be referenced as a mandatory requirement in NFPA 1977 rather than repeating the ANSI Z89.1 requirements.
Committee Meeting Action: Accept
Committee Statement: See actions taken on 1977-35 (Log #124) and 1977-73 (Log #125).

1977-3 Log #161 FAE-WFF **Final Action: Accept**
(Entire Document)

Submitter: Paul Broyles, US Department of the Interior-Natl Park Services
Comment on Proposal No: 1977-1
Recommendation: Remove all references to chainsaw foot protection.
Substantiation: We have no substantive records of foot injuries caused by chain saw cuts on wildland firefighting. Requiring either full overboot or permanently attached protection will in fact cause many more problems associated with tripping or slowing down a sawyer if having to escape in an entrapment situation. This makes no safety sense!
Committee Meeting Action: Accept

1977-4 Log #172 FAE-WFF **Final Action: Accept**
(Entire Document)

Submitter: Les Holsapple, USDA Forest Service
Comment on Proposal No: 1977-1
Recommendation: Delete all reference to chain saw foot protection.
Substantiation: Such a requirement would significantly increase tripping hazard and reduce potential for mobility and agility of chain saw operators in wildland setting. I would such a requirement to produce negative results.
Committee Meeting Action: Accept

1977-5 Log #43 FAE-WFF **Final Action: Accept**
(Entire Document)

Submitter: Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment
Comment on Proposal No: 1977-2
Recommendation: The TCC directs the TC to add or delete the following text, as indicated, in the document.
Add the following text to Section 1.3, Application, to read: "1.3.X* The requirements of this standard shall not apply to any accessories that could be attached to the product but are not necessary for the product to meet the requirements of this standard."
Add the following annex text as A.1.3.X, to read: "A.1.3.X Emergency response organizations are cautioned that accessories are not part of the certified product but could be attached to a certified product by a means not engineered, manufactured, or authorized by the certified product manufacturer. Emergency response organizations are cautioned that if an accessory or its means of attachment causes the structural integrity of the certified product to be compromised, the certified product might not be compliant with the standard that to which it was originally certified as compliant. Additionally, if an accessory or the accessory's means of attachment are not designed and manufactured from suitable materials for the hazardous environments of emergency incidents, the failure of the accessory, or its means of attachment, could cause injury to the emergency responder.
Because the aftermarket for accessories for certified product is so broad, emergency response organizations are advised to contact both the accessory manufacturer and the manufacturer of the certified product and verify that the accessory and its means of attachment are suitable for use in the intended emergency response environment. Emergency response organizations should seek and receive written documentation to validate the following information from the accessory manufacturer.
1. Accessories for certified product, and the means of attachment, will not degrade the designed protection or performance of the certified product below the requirements of this standard to which it was designed, manufactured, tested, and certified.
2. The accessory, when properly attached to the certified product, will not interfere with form, fit, or function of any of the certified product or with the form, fit, and function of any of the certified product's component parts.
Users are also cautioned that the means of attachment for accessories that fail to safely and securely attach the accessory to a certified product can allow the accessory to become inadvertently dislodged from the certified product and could cause a risk to emergency response personnel in the vicinity."
In Section 3.3 , General Terms, delete 3.3.1, Accessories.
Delete Section 6.9 , Accessory Design Requirements.
Substantiation: The TCC is amending the existing text on accessories for all documents in the Project for consistency with each product standard. The standards should not address requirements for items that are not part of the minimum requirements of the standard.
Committee Meeting Action: Accept

1977-6 Log #44 FAE-WFF **Final Action: Accept**
(1.1.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Add asterisk to the following section:
1.1.3 * This standard shall..."
Substantiation: This paragraph has an associated annex item, however it is not indicated in the body of the standard.
Committee Meeting Action: Accept

1977-7 Log #43b FAE-WFF **Final Action: Accept in Principle**
(1.3, A.1.3.x.x 4.5.2.1, 4.5.2.2)

TCC Action: Change action on 1977-7 (Log 43b) from "Hold" to "Accept in Principle"
Revise definition of Manufacturer to read:
1.3.X Manufacturer. The entity that manages the design processes, manufacturing processes, quality assurance processes, assumes the liability for the product, and provides the warranty for the compliant product.
Revise Section 4.5 to read:
4.5 ISO Registration for Manufacturers.

4.5.1 The manufacturer shall provide and operate a quality assurance program that meets the requirements of this section and that includes a product recall system as specified in 4.2.7.1, and Section 4.8, Manufacturers' Safety Alert and Product Recall Systems.

4.5.2 The operation of the quality assurance program shall evaluate and test compliant product production to the requirements of this standard to assure production remains in compliance.

4.5.3 The manufacturer shall be registered to ISO 9001, *Quality management systems – requirements* .

4.5.3.1 Registration to the requirements of ISO 9001 shall be conducted by a registrar that is accredited for personal protective equipment in accordance with ISO 62 , *General requirements for bodies operating assessment and certification / registration of quality systems* . The registrar shall affix the accreditation mark on the ISO registration certificate.

4.5.3.2 The scope of the ISO registration shall include at least the design and manufacturing systems management for the type of personal protective equipment being certified.

4.5.4* Any entity that meets the definition of manufacturer specified in Section 3.3, General Definitions, and therefore is considered the "manufacturer" but does not manufacture or assemble the compliant product, shall meet the requirements specified in this Section 4.5.

4.5.5 Where the manufacturer uses sub-contractors or component manufacturers in construction or assembly of the compliant product, the locations and names of all manufacturing facilities, all sub-contractor facilities, and all component manufacturer facilities shall be documented and the documentation shall be provided to the manufacturer's ISO registrar, and to the certification organization.

4.5.5.1 Component manufacturers shall be considered as sub-contractors.

4.5.5.2 Sub-contractors shall include but not be limited to a person or persons, or a company, firm, corporation, partnership, or other organization having an agreement with or under contract with the compliant product manufacturer to supply or assemble components of the compliant product, or to assemble portions of the compliant product.

4.5.5.3 The assembly portion of the manufacturing process shall include but not be limited to the sewing, gluing, laminating, tacking, or other means of attaching whereby materials or component parts are joined together to form a portion, a component, or a complete compliant product.

4.5.6 All sub-contractors, where different from the manufacturer, shall also be registered to the requirements of ISO 9001, *Quality management systems – requirements* , for manufacturing, unless the provisions specified in 4.5.6.1 and 4.5.6.2 apply.

4.5.6.1 The manufacturer shall be permitted to include subcontractors in the manufacturer's ISO 9001 registration in lieu of requiring the sub-contractor to have their own ISO registration.

4.5.6.2 Where the manufacturer applies their ISO registration to sub-contractors, this action shall require the inclusion of the subcontractors' addresses and functions on the manufacturer's ISO 9001 registration certificate, and the manufacturer shall provide the certification organization with copies of the ISO 9001 registrar's reports showing acceptable inclusion of these locations for the functions they perform for the manufacturer.

The TCC provided the current text being used throughout the Project for consistency regarding manufacturers' quality assurance programs.

Submitter: Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment

Comment on Proposal No: 1977-2

Recommendation: The TCC directs the TC to incorporate the following revised text as indicated below into the applicable sections to address standardized text for ISO registration purposes.

Add a new definition of "assembler" to read:

"1.3.X.X Assembler. A person, or persons, company, firm, corporation, partnership, or other organization that uses materials and component parts in the assembly of the complete product, or portions of that product. The assembler can also be the manufacturer."

Add a new definition of "Assemble" to read:

1.3.X.X Assembly . Processes including, but not limited to, sewing, gluing, laminating, tacking, or other means of attaching, whereby materials or component parts are put together to form a portion of the compliant product, or the compliant product.

Revise 1.3.3.15 and add new A.1.3.3.15 to read:

"1.3.X.X Component(s)* . Any material, part, or subassembly used in the construction of the compliant product."

"A.1.3.X.X Component(s) . Components include items required for the design and construction of the product and are evaluated and tested individually, or are evaluated and tested as a part of the whole product."

Add a new definition of "manufacturer" to read:

"1.3.X.X Manufacturer. The entity that assumes the liability, provides the warranty for the compliant product, or obtains the product certification."

Add new 4.5.2.1 and 4.5.2.2 to read:

"4.5.2.1 The assembler, if different from the manufacturer, shall also be registered to ISO 9001, *Quality management systems - requirements* ."

"4.5.2.2 Where multiple assemblers are used in the manufacture of the compliant product, each assembler shall be registered to ISO 9001, *Quality management systems - requirements* ."

Substantiation: The TCC is revising text as necessary to assure standardized text is used regarding "follow-up programs" in all product documents within the Project.

Committee Meeting Action: Hold

Committee Statement: Hold pending revised text from the TCC.

1977-8 Log #CC1 FAE-WFF **Final Action: Accept**
(Chapter 3)

Submitter: Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment

Comment on Proposal No: 1977-1

Recommendation: Revise the following definitions to conform to the Definitions Glossary for the Project on Fire and Emergency Services Protective Clothing and Equipment.

Bottom Circumference Measurement of upper or lower torso garment along bottom edge of the garment from folded edge to folded edge, and multiplied by two to obtain circumference.

Brim A part of the shell of the helmet extending around the entire circumference of the helmet.

Certification/Certified A system whereby a certification organization determines that a manufacturer has demonstrated the ability to produce a product that complies with the requirements of this standard, authorizes the manufacturer to use a label on listed products that comply with the requirements of this standard, and establishes a follow-up program conducted by the certification organization as a check on the methods the manufacturer uses to determine continued compliance of labeled and listed products with the requirements of this standard.

Chest Circumference Measurement of upper torso garment from folded edge to folded edge, at base of armholes, and multiplied by two to obtain circumference.

Component(s)* Any material, part, or subassembly used in the construction of the compliant product.

ANNEX: Components include items required for the design and construction of the product and are evaluated and tested individually, or are evaluated and tested as a part of the whole product.

Cuff Circumference Measurement of torso garment cuff along bottom of opening from folded edge to folded edge, and multiplied by two to obtain circumference.

Face/Neck Protective

Shroud See definition of: wildland fire fighting protective face/neck shroud.

NOTE: Cross reference term only.

Footwear See definition of: Wildland Fire Fighting protective footwear.

Footwear Upper That portion of the footwear element above the sole, heel and insole.

Front Waist Pocket(s) Slanted or side seam opening pockets that open to the exterior, located at or near the front waist of a garment.

Garment See definition of: Wildland Fire Fighting protective garment.

Glove See definition of: Wildland Fire Fighting protective glove.

Goggle Clip The component of the helmet that retains the strap of goggle or headlamp.

Goggles The component of the helmet that provides protection to the wearer's eyes and a portion of the wearer's face.

Hardware Non-fabric components of the protective clothing and equipment including, but not limited to, those made of metal or plastic.

Helmet See definition of: Wildland Fire Fighting protective helmet.

Insole The inner component of the footwear upon which the foot rests.

Interlining Any textile that is incorporated into any garment as a layer between the outer and inner layers.

Liner A detachable lining component designed to be worn inside a protective clothing item or helmet ~~jacket~~ to provide warmth.

Lower Torso The area of the body trunk below the waist, excluding the legs, ankles, and feet.

Manufacturer The entity that assumes the liability, provides the warranty for the compliant product, or obtains the product certification.

Melt A response to heat causing a change from solid to liquid, or become consumed.

Nape Device A component of the helmet that is located below the Bitragion Inion Arc used to aid in helmet retention.

Neck Circumference Upper torso measurement from folded edge to folded edge at the midpoint of the collar width with the garment front closure closed at the top and the top edges of the collar in horizontal alignment. Multiply this measurement by 2 to obtain the circumference.

Neck Shroud See definition of: Wildland Fire Fighting protective face/neck shroud.

One-Piece Garment A single-piece protective garment designed to provide minimum protection to the upper and lower torso, arms, and legs, excluding the head, hands, and feet.

Patch Pocket(s) Pockets located on the exterior of protective garments.

Pocket Label A label or marking affixed to each compliant item of a protective clothing or equipment or fire shelter by the manufacturer. Such

labels contain compliance statements, certification statements, general information, care, maintenance, or similar data. The product label is not the certification organization's label, symbol, or identifying mark; however, the certification organization's label, symbol, or identifying mark can be attached to it or be part of the product label.

Protective Clothing See definition of: Wildland Fire Fighting protective clothing.

Protective Clothing Any material or combination of materials used in an item of clothing designed to provide minimum protection from the inherent risks of wildland fire fighting.

Protective Footwear See definition of: Wildland Fire Fighting protective footwear.

Protective Garment See definition of: Wildland Fire Fighting protective garment.

Protective Glove See definition of: Wildland Fire Fighting protective glove.

Protective Helmet See definition of: Wildland Fire Fighting protective helmet.

Protective Jacket See definition of: Wildland Fire Fighting protective jacket.

Protective One-Piece

Garment See definition of: Wildland Fire Fighting protective one-piece garment.

Protective Shirt See definition of: Wildland Fire Fighting protective shirt.

Protective Trouser See definition of: Wildland Fire Fighting protective trouser.

Proximity Fire Fighting Specialized fire-fighting operations that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of conductive, convective, and radiant heat, such as aircraft fires, bulk flammable gas fires, and bulk flammable liquid fires. Specialty thermal protection from exposure to high levels of radiant heat, as well as thermal protection from conductive and convective heat, is necessary for persons involved in such operations due to the scope of these operations and the close distance to the fire that these operations are conducted although direct entry into flame is NOT made. Usually these operations are exterior operations, but might be combined with interior operations. Not structural fire fighting, but might be combined with structural fire-fighting operations. Not entry or wildland fire fighting. *See also Entry Fire Fighting, Structural Fire Fighting, and Wildland Fire Fighting*.

Retroreflective Markings A material that reflects light back to the light source.

Sample Protective clothing or equipment items taken from a manufacturer's current production lot. *See also Sepcimen*.

Seam (major) Those seam assemblies where rupture exposes the wearer to immediate danger.

Seam (major B) Moisture barrier or thermal barrier seam assemblies where rupture could reduce the protection of the garment by exposing the next layer of the garment, the wearer's station/work uniform, other clothing, or skin.

Seam assembly The structure obtained when fabrics ~~materials~~ are joined by means of a seam.

Seam (sewn seam strength) The maximum resistance to rupture of the junction formed by stitching together two or more planar structures, such as textile fabrics.

Seat Circumference Lower torso garment measurement from 1 in. (2.5 cm) above bottom of fly curve from folded edge to folded edge. Multiply this measurement by 2 to obtain circumference.

Separate A material response evidenced by splitting or delaminating.

Shank The component of footwear that provides additional support to the instep.

Shirt A protective garment, without a cold weather liner, that is designed to provide minimum protection to the upper torso and arms, excluding the head and hands, worn over undergarments or other clothing and usually tucked into the trousers.

Shroud See Face/Neck Shroud.

Specimen The item that undergoes testing and is known as the sample in some cases.

Thigh Circumference Lower torso garment measurement at crotch line from folded edge to folded edge. Multiply this measurement by 2 to obtain circumference.

Top Line The top edge of the protective footwear that includes the tongue, gusset, quarter, collar, and shaft.

Trim Material attached to the exterior surface of protective clothing or equipment to enhance visibility. Retroreflective materials enhance night time visibility, and fluorescent materials enhance daytime visibility.

Trousers A protective garment designed to provide minimum protection to the lower torso and legs, excluding the feet, worn over undergarments or other clothing.

Upper Torso The area of the body trunk above the waist and extending to the shoulder, excluding the arms, wrists, and hands.

Vertical Circumference One-piece garment measurement from junction of shoulder/collar seam down to the bottom of the crotch. Multiply this measurement by 2 to obtain circumference.

Waist Circumference A garment measurement from top edge of waistband from folded edge to folded edge. Multiply this measurement by 2 to obtain circumference.

Wear Surface The bottom of the footwear sole, including the heel.

Wildland Fire Fighting

Protective Clothing

And Equipment* Multiple items of compliant protective clothing and equipment products that provide protection from some risks, but not all risks, of emergency incident operations.

ANNEX: **Wildland Fire Fighting Protective Clothing and Equipment** includes, but is not limited to, garments, helmets, goggles, face/neck shrouds, gloves, chain saw protection, footwear, and load-carrying equipment.

Wildland Fire Fighting

Chain Saw Protection The item of protective equipment **that provides protection to the** legs, or to the lower torso and legs, excluding the ankles and feet.

Wildland Fire Fighting

Protective Cold Weather

Outerwear The item of protective clothing that provides protection to the upper or lower torso, arms, and legs to provide insulation for warmth of the wearer during cold weather.

Wildland Fire Fighting

Protective Face/Neck

Shroud The item of protective clothing that provides protection to the face and neck area.

Wildland Fire Fighting

Protective Footwear The item of protective clothing that provides protection to the foot, ankle and lower leg.

Wildland Fire Fighting

Protective Garment The item of protective clothing that provides protection to the wearer's upper or lower torso, or upper and lower torso, excluding the hands, face and feet.

ANNEX: Wildland fire fighting garments include, but are not limited to, jacket, shirt, trouser, cold weather outerwear, or one-piece garment (See also Wildland Fire Fighting Protective Clothing and Equipment.)

Wildland Fire Fighting

Protective Glove The item of protective clothing that provides protection to the hand and wrist.

Wildland Fire Fighting

Protective Goggles The item of protective equipment that provides protection to the eyes and a portion of the face.

Wildland Fire Fighting

Protective Helmet The item of protective equipment that provides protection to the head.

Wildland Fire Fighting

Protective Jacket The protective outer garment item that provides minimum protection to the upper torso and arms, excluding the hands and head.

Wildland Fire Fighting

Protective Load-Carrying

Equipment The items of protective equipment that are worn by the wildland fire fighter to facilitate the carrying of gear.

Wildland Fire Fighting

Protective One-Piece

Garment The single-piece protective garment item that provides protection to the upper and lower torso, arms, and legs, excluding the head, hands, and feet.

Wildland Fire Fighting

Protective Shirt The protective garment item that provides protection to the upper torso and arms, excluding the head and hands.

Wildland Fire Fighting

Protective Trouser The protective garment item that provides protection to the lower torso and legs, excluding the feet.

Substantiation: To conform to the Definitions Glossary for the Project on Fire and Emergency Services Protective Clothing and Equipment.

Committee Meeting Action: Accept

1977-9 Log #121 FAE-WFF **Final Action: Accept**
(3.X.X Brim, Peak (New))

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Add new definitions to read:

3.X.X Brim. An integral part of a helmet shell extending outward around the entire circumference of the lower shell.

3.X.X Peak. A part of the shell extending forward over the wearers forehead.

Substantiation: The terms Brim and Peak are used as references in the design and performance requirements, but are not themselves defined in the Standard.
Committee Meeting Action: Accept

1977-10 Log #2 FAE-WFF **Final Action: Accept in Principle**
(Chapter 3)

Submitter: Daniel Gohlke, W.L. Gore & Assoc., Inc.
Comment on Proposal No: 1977-8
Recommendation: Add definitions as follows:

Sample. An amount of material or product representative of production that is conditioned for the purpose of subsequent testing.

Specimen. An amount of material or product representative of production

upon which a test is conducted. Specimens are taken from conditioned samples. In some cases, the specimens are the samples.
Substantiation: This provides some clarity and consistency for the use of these terms.
Committee Meeting Action: Accept in Principle
Committee Statement: The TC will revise to use the Project Definitions.

1977-11 Log #127 FAE-WFF **Final Action: Accept in Principle**
(3.3.XX Wildland Fire Fighting Chain Saw Protectors)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
Wildland Fire Fighting Chain Saw Protectors. An item of ... contact with the chain of a moving power saw.
Substantiation: The purpose of wearing this type of PPE is to protect wearers from the potential for injury when the cutters linked to the chain saw are in motion (moving).
Committee Meeting Action: Accept in Principle
Committee Statement: The Committee will use the Projet Definitions Glossary definition.

1977-12 Log #20 FAE-WFF **Final Action: Accept**
(3.3.32, 3.3.33, 3.3.34 and 3.3.39)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Change references to 3.3.100, 3.3.101, 3.3.102, and 3.3.103 respectively.
Substantiation: The incorrect paragraphs have been referenced.
Committee Meeting Action: Accept
Committee Statement: The entire section will be renumbered.

1977-13 Log #19 FAE-WFF **Final Action: Accept**
(4.1.2.1)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Change references to Section 6.5 (not 6.6).
Substantiation: The incorrect section has have been referenced.
Committee Meeting Action: Accept

1977-14 Log #23 FAE-WFF **Final Action: Accept**
(4.1.2.2 and 5.5.1.8)

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
~~4.1.2.2 The wildland fire fighting protective face/neck shroud shall be labeled and listed with the identification of the compliant helmet or helmets with which it was certified.~~
5.5.1.8(5) Identification of the compliant helmet or helmets with which it was certified.
Substantiation: 4.1.2.2 is a labeling requirement and should be moved to section 5.5.1.8.
Committee Meeting Action: Accept

1977-15 Log #43a FAE-WFF **Final Action: Accept in Principle**
(4.2.9, 4.2.9.2, 4.2.9.3)

TCC Action: Change action on 1977-15 (Log 43a) from "Hold" to "Accept in Principle"
Revise 4.2.9 to read:
4.2.9* The certification organization shall have a follow-up inspection program of the manufacturer's facilities of the compliant product with at least two random and unannounced visits per 12-month period to verify the product's continued compliance.
4.2.9.1 As part of the follow-up inspection program, the certification organization shall select sample compliant product at random from the manufacturer's production line, from the manufacturer's in-house stock, or from the open market.
4.2.9.2 Sample product shall be evaluated by the certification organization to verify the product's continued compliance in order to assure that the materials, components, and manufacturing quality assurance systems are consistent with the materials, components, and manufacturing quality assurance that were inspected and tested by the certification organization during initial certification and recertification.
4.2.9.3 The certification organization shall be permitted to conduct specific testing to verify the product's continued compliance.
4.2.9.4 For products, components, and materials where prior testing, judgment, and experience of the certification organization have shown results to be, in jeopardy of not complying with this standard, the certification organization shall conduct more frequent testing of sample product, components, and materials acquired in accordance with 4.2.9.1 against the applicable requirements of this standard.
The TCC provided the current text being used throughout the Project for consistency in the "follow-up program" requirements.
Submitter: Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment
Comment on Proposal No: 1977-2
Recommendation: The TCC directs the TC to revise the following text in Section 4.2, as follows.
Revise 4.2.9 to read:
"4.2.9 The certification organization shall have a follow-up inspection program of the manufacturing facilities of the compliant product with at least two random and unannounced visits per 12-month period to verify the product's continued compliance."
Revise 4.2.9.2 to read:
"4.2.9.2 Sample product shall be inspected by the certification organization to verify the product's continued compliance by assuring that the materials, components, and methods of manufacture are consistent with the materials, components, and methods of manufacture tested by the certification organization during initial certification and recertification. The certification organization shall be permitted to conduct specific testing to verify the product's continued compliance."
Add new 4.2.9.3 to read:
"4.2.9.3 For products, components, and materials where prior testing, judgment and experience of the certifying organization has shown results to be marginal, the certification organization shall conduct testing of sample products, components, and materials, as acquired in 4.2.9.1, against the applicable requirements of this standard."
Substantiation: The TCC is revising text as necessary to assure standardized text is used regarding "follow-up programs" in all product documents within the Project.
Committee Meeting Action: Hold
Committee Statement: The TC will defer to the revised text from the TCC.

1977-16 Log #43c FAE-WFF **Final Action: Accept**
(4.4)

Submitter: Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment
Comment on Proposal No: 1977-2
Recommendation: The TCC directs the TC to reevaluate Section 4.4, Recertification, to be sure annual recertification issues are properly addressed for the USAR ensemble.
Also, retitle Section 4.4 to read: "Annual Verification of Product Compliance"
Substantiation: The TCC is directing each TC to readdress Section 4.4 to determine its need and relevance for the product covered by each document, and to revise as the TC deems necessary.
Committee Meeting Action: Accept
Committee Statement: See action taken on Comment 1977-17 (Log #40).

1977-17 Log #40 FAE-WFF **Final Action: Accept**
(4.4.1)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Modify 4.4.1 to read as follows:
4.4.1 All protective clothing and equipment that are labeled as being compliant with this standard shall undergo recertification on an annual basis. This recertification shall include the following:
(1) Inspection and evaluation to all design requirements as required by this standard on all manufacturer models and components
(2) Testing to all performance requirements as required by this standard on all manufacturer models and components with the following protocol:
a. Where a test method incorporates testing both before and after laundering precondition specified in 8.1.2 and the test generates quantitative results, recertification testing shall be limited to the conditioning which yielded the worst case test result during the initial certification for the model or component.
b. Where a test method incorporates testing both before and after laundering preconditioning specified in 8.1.2 and the test generates non-quantitive results (e.g., pass/fail for melt/drip), recertification shall be limited to a single conditioning procedure in any given year. Subsequent annual recertifications shall cycle through the remaining conditionings procedures to ensure that all required conditionings are included over time.
c. Where a test method requires the testing of three specimens, a minimum of one specimen shall be tested for annual recertification.
d. Where a test method requires the testing of five or more specimens, a minimum of two specimens shall be tested for annual recertification.
4.4.2 Samples of manufacturer models and components for recertification acquired from the manufacturer or component supplier during random and unannounced visits as part of the follow-up inspection program in accordance with 4.2.9 shall be permitted to be used toward annual recertification.
Substantiation: Currently, all recertification testing must be performed to the

same number of samples, specimens, and conditions as used in initial certification testing. The proposed changes to recertification provide a complete evaluation of the product in subsequent years, but using a reduced number of samples, specimens, and conditions for economy of testing that still provides an adequate assessment of product compliance.
Committee Meeting Action: Accept

1977-18 Log #45 FAE-WFF **Final Action: Accept**
(4.5)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Add asterisk to the following section:
4.5 * ISO Registration for Manufacturers.
Substantiation: This paragraph has an associated annex item, however it is not indicated in the body of the standard.
Committee Meeting Action: Accept

1977-19 Log #46 FAE-WFF **Final Action: Accept in Principle**
(5.5.1.8)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Add new text as follows:
(5) Helmet Model Protective Face/Neck Shroud is Approved with.
Substantiation: Since the Face/Neck Shroud is a stand alone element, the label should include what helmet the Face/Neck Shroud is approved for use with in order to ensure proper coverage. If not on the label, this information should be provided in the User Guide as a minimum.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-14 (Log #23).

1977-20 Log #18 FAE-WFF **Final Action: Accept in Principle in Part**
(5.5.1.9 (new), 5.5.2.6 (new))

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Add text to read as follows:
5.5.1.9 (new) The manufacturer shall list the helmet or helmets with which the face/neck shroud has been certified by manufacturer name and model number.
5.5.2.6 (new) The manufacturer shall identify helmet or helmets with the face/neck shroud has been certified by manufacturer name and model number and include instructions in the user information for how the face/neck shroud is worn with each helmet with which the face/neck shroud is certified.
Substantiation: A requirement must be added to the labeling section for face/neck shroud requirements that addresses the need to specify the helmets for which the face/neck shroud has been tested with in order to be consistent with paragraph 4.1.2.2.
Committee Meeting Action: Accept in Principle in Part
5.5.1.9 Accept in Principle in Part.
5.5.2.6 Accept.
Committee Statement: See Committee Action taken on Comment 1977-14 (Log #23).

1977-21 Log #47 FAE-WFF **Final Action: Accept**
(5.7.2.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
5.7.2.1 The ~~garment~~ chain saw protector manufacturer shall provide at least the user information that is specified in 5.7.2.5 with each ~~garment~~ .
Substantiation: This section covers chain saw protectors not garments.
Committee Meeting Action: Accept

1977-22 Log #128 FAE-WFF **Final Action: Accept**
(5.7.2.1)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
The chainsaw protector manufacturer...
Substantiation: Maintains same wording as used in 5.7.2.2.
Committee Meeting Action: Accept

1977-23 Log #129 FAE-WFF **Final Action: Reject**
(5.7.2.2)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
The chain saw protector manufacturer... to the chain saw leg protector or chain saw foot protector ...
Substantiation: Includes both types of chain saw protector - leg and foot.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-3 (Log #161).

1977-24 Log #48 FAE-WFF **Final Action: Reject**
(5.7.2.2, 5.7.2.3, 5.7.2.5)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Insert the words “or foot” between the words “leg” and “protector” in all locations in these paragraphs referenced.
Substantiation: I believe the intent is to allow for leg or foot protectors in the Chain Saw Protector products.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-3 (Log #161).

1977-25 Log #130 FAE-WFF **Final Action: Reject**
(5.7.2.3)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
The chain saw leg protector and chain saw foot protector manufacturer...
Substantiation: Includes both types of chain saw protectors - leg and foot.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-3 (Log #161).

1977-26 Log #131 FAE-WFF **Final Action: Reject**
(5.7.2.5)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
The chain saw... each pair of chain saw leg protectors or chain saw foot protectors .
Substantiation: Includes both types of chain saw protectors - leg and foot.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-3 (Log #161).

1977-27 Log #49 FAE-WFF **Final Action: Accept**
(5.8.1.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Delete the following asterisk:
5.8.1.1*
Substantiation: Delete “*” after this paragraph as there is no corresponding annex item for this paragraph.
Committee Meeting Action: Accept

1977-28 Log #50 FAE-WFF **Final Action: Accept**
(5.8.2.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
The ~~garment~~ load carrying equipment manufacturer shall provide at least the user information that is specified in 5.8.2.5 with each ~~garment~~ load carrying equipment item.
Substantiation: This section covers load carrying equipment not garments.
Committee Meeting Action: Accept

1977-29 Log #174 FAE-WFF **Final Action: Hold**
(5.9, 6.10, 7.9, 8.38 (New))

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Add labeling/information, design, and performance requirements for Wildland Protective Air-Purifying Respirators as follows:
5.9 Air-Purifying Respirator.
5.9.1 Product Labeling Requirements.
5.9.1.1 Each air-purifying respirator shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located on each air-purifying respirator when the air-purifying respirator is properly assembled with all components in place.
5.9.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.
5.9.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label.
5.9.1.4* The certification organization’s label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.
5.9.1.5 All worded portions of the require product label shall be printed at least in English.

5.9.1.6 Symbols and other pictorial graphic representation shall be permitted to be used to supplement worded statements on the product label(s).

5.9.1.7 The following statement shall be printed legibly on the product label with all letters shall be at least 2.5 mm (3/32 in.) high.

"THIS WILDLAND FIRE FIGHTING AIR-PURIFYING RESPIRATOR MEETS THE AIR-PURIFYING RESPIRATOR REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING, 2005 EDITION."

5.9.1.8 At least the following information shall also be printed legibly on the product label with all letters at least 2 mm (1/16 in.) high:

(a) Manufacturer's name, identification, or designation
(b) Manufacturer's address
(c) Country of manufacture
(d) Manufacturer's shroud identification number, lot number, or serial number
(e) Month and year of manufacture (not coded)
(f) Model or style name, number, or design
(g) Size
(h) Cleaning precautions
(i) The following statement: "DO NOT REMOVE THIS LABEL"

5.9.2 User Information.

5.9.2.1 the air-purifying respirator manufacturer shall provide at least the user information that is specified in 5.9.2.4 with each air-purifying respirator.

5.9.2.2 The air-purifying respirator manufacturer shall attach the required user information, or packaging containing the user information, to the shroud in such a manner that it is not possible to use the air-purifying respirator without being aware of the availability of the information.

5.9.2.3 The required user information, or packaging containing the user information, shall be attached to the air-purifying respirator so that a deliberate action is necessary to remove it. The air-purifying respirator manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.9.2.4 The air-purifying respirator manufacturer shall provide at least the following instructions and information with each air-purifying respirator.

(a) Pre-use information
1. Safety considerations
2. Limitations of use.
3. Shroud marking recommendations and restrictions
4. A statement that most performance properties of the chain saw leg protector cannot be tested by the user in the field.
5. Warranty information
(b) Preparation for use
1. Sizing/adjustment
2. Recommended storage practices
(c) Inspection frequency and details
(d) Don/doff
1. Donning and doffing procedures
2. Sizing and adjustment procedures
3. Interface issues
(e) Proper use consistent with NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, and Title 29, Code of Federal Regulations, Part 1910.132, "Personal Protective Equipment"
(f) Maintenance and cleaning
1. Cleaning instructions and precautions with a statement advising users not to use chainsaw leg protectors that are not thoroughly cleaned and dried
2. Maintenance criteria ad methods of repair where applicable
3. Decontamination procedures
(g) Retirement and disposal criteria and considerations

6.10 Air-Purifying Respirator Design Requirements.

6.10.1 Air-Purifying respirators shall be NIOSH certified to the requirements for air-purifying respirators contained in 42 CFR Part 84.

6.10.2 The air-purifying respirators shall be equipped with canisters or cartridges rated for the removal of carbon monoxide and particulates with a minimum rated service life of 8 hours.

6.10.3 Air-purifying respirators shall be equipped with an end-service indicator meeting the requirements of 42 CFR Part 84 for air-purifying respirators.

7.9 Air-Purifying respirator performance Requirements.

7.9.1 Air-purifying respirators shall be tested for heat resistance as specified in Section 8.38, Respirator Heat Resistance Test, and shall not separate, melt, drip, or ignite.

7.9.2 Any textile material used in the construction of the air-purifying respirator shall be tested for flame resistance as specified in Section 8.3, Flame Resistance Test One, and shall not be totally consumed, shall not have an afterflame time of more than 2 seconds, and shall not melt or drip.

8.38 Respirator heat Resistance Test.

8.38.1 Application. This test method shall apply to the air-purifying respirators.

8.38.2 Specimens. Heat resistance testing shall be conducted on at least three specimens. Specimens shall consist of all components in placed for the air-purifying respirator arranged in the order and orientation as worn.

8.38.3 Sample Preparation. Specimens to be tested shall be conditioned as specified in 8.1.1.

8.38.4 apparatus.

8.38.4.1 The test oven shall be a horizontal flow circulating oven with minimum interior dimensions such that the specimen shall be at least 51 mm (2.0 in) room any interior oven surface.

8.38.4.2 The test oven shall have an airflow rate of 38 m/min to 76 m/min (125 ft/min to 250 ft/min at the standard temperature and pressure of 21°C (70°F) at 1 atmosphere, measured at the center point of the oven.

8.38.4.3 A test thermocouple shall be positioned so that it is level with the horizontal centerline of a mounted sample specimen. The thermocouple shall be equidistant between the vertical centerline of a mounted specimen placed in the middle of the oven and the oven wall where the air flow enter the test chamber. The thermocouple shall be an exposed bead, Type J or K, No. 30 AWG thermocouple. The test oven shall be heated and the test thermocouple stabilized at 260°C +6/-0°C (500°F, +10/-0°F) for a period of not less than 30 minutes.

8.38.5 Procedure.

8.38.5.1 Sample air-purifying respirators shall be mounted in accordance with the on a room temperature nonconductive headform in the "as worn" position. The headform with air-purifying respirator shall be placed in the center of the test oven with the centerline of the front of the helmet facing the air flow.

8.38.5.2 The oven door shall not remain open more than 15 seconds. The air circulation shall be shut off while the door is open and turned on when the door is closed. The total oven recovery time after door is closed shall not exceed 30 seconds.

8.38.5.3 The specimen, mounted as specified, shall be exposed in the test oven for 5 minutes, +0.15/-0 min. The test exposure time shall begin when test thermocouple recovers to a temperature of 260°C, +6/-0°C (500°F, +10/-0°F).

8.38.5.4 Immediately after the specified exposure, the specimen shall be removed and examined for evidence of ignition, melting, dripping, or separation.

8.38.5.5 After the specified exposure, the specimen shall also be measured to determine pass/fail.

8.38.6 Report. Observations of ignition, melting, dripping, or separation shall be reported for each specimen.

8.38.7 Interpretation. Any evidence of ignition, melting, dripping, or separation on any specimen shall constitute failing performance.

Substantiation: I do not agree on the committee's handling of Proposal Log #22. Despite the development of respiratory performance criteria being outside the scope of the committee, the industry continues to be plagued by the offering or products with erroneous, ill-founded, and dangerous claims for firefighter respiratory protection during wildland fires. The refusal of the Technical Committee on Respiratory Protective Equipment to deal with this issue is not justification to ignore this protection need. Specific labeling, design and performance criteria are proposed for air-purifying respirators meeting NIOSH requirements and additional criteria appropriate for wildland fire fighting.

Committee Meeting Action: Hold

Committee Statement: The Committeee will also refer this issue to TC RPE. In the abbreviated time the Committee has to process Comments, there was insufficient time to adequately address the complexity of the issued raised by this comment.

The comment proposes change for which sufficient debate or public review has not occured.

1977-30 Log #43d FAE-WFF **Final Action: Hold**
(Chapter 6)

Submitter: Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment
Comment on Proposal No: 1977-2
Recommendation: In Chapter 6, the TCC endorses the approach to have visibility enhancement as an option and to have the visibility enhancement based on overall garment performance requirements. The TCC directs the TC consider adopting part or all of the visibility enhancement proposed in 6.1.18 of the ROP for NFPA 1951 into NFPA 1977 and to resolve the definitions, labeling, design, performance and testing issues regarding visibility enhancement.

Substantiation: The TCC is highlighting this proposed change to gather public input during the Public Comment period and to remind the TC to fully address visibility enhancement items throughout the document.

Committee Meeting Action: Hold

Committee Statement: The comment proposed change for which sufficient debate or public review has not occured.

1977-31 Log #51 FAE-WFF **Final Action: Accept**
(6.1.6.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:

With an upper torso garment, other than cold weather outerwear, prepared as specified in ~~6.1.15.5~~ 6.1.17.7 , a line shall be formed between the two lowest points on the garment bottom edge. Minimum front and back lengths shall extend to that line as a minimum.

Substantiation: Improper reference paragraph cited.
Committee Meeting Action: Accept

1977-32 Log #39 FAE-WFF **Final Action: Reject**
(6.1.17.1, 6.1.17.2, 6.1.17.3)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Replace Paragraphs 6.1.17.1, 6.1.17.2, and 6.1.17.3 with the following:
6.1.17* Size Requirements.
6.1.17.1 In order to label an upper torso protective garment or coverall as compliant with this standard, the manufacturer shall provide, as a minimum men's and women's chest sizes, in increments no greater than 50 mm (2 in.), and sleeve lengths, increments no greater than 25 mm (1 in.), in the ranges as specified in Table 6.1.17.1.

Table 6.1.17.1 Available Garment Size Ranges

	Men	Women	Increment
Chest	865 mm – 1525 mm (34 in. – 60 in.)	710 mm – 1270 mm (28 in. – 50 in.)	50 mm (2 in.)
Sleeve	820 mm – 925 mm (32 in. – 38 in.)	(710 mm – 865 mm (28 in. – 34 in.)	25 mm (1 in.)
Waist	760 mm – 1525 mm (30 in. – 60 in.)	710 mm – 1270 mm (28 in. – 50 in.)	50 mm (2 in.)
Inseam	660 mm – 915 mm (26 in. – 36 in.)	610 mm – 865 mm (24 in. – 34 in.)	50 mm (2 in.)

6.1.17.2 In order to label a lower torso trouser as compliant with this standard, the manufacturer shall provide, as a minimum, men's and women's waist sizes, in increments no greater than 50 mm (2 in.), and inseam lengths, in increments no greater than 50 mm (2 in.), in the ranges as specified in Table 6.1.17.1.
6.1.17.3 Men's and women's sizing shall be accomplished by men's and women's individual patterning.
6.1.17.4 Cold weather outerwear shall be provided in a minimum of five distinct sizes ranging from chest size 39 through 59, and sleeve length of 775 mm (30 1/2 in.) to 900 mm (35 1/2 in.).
6.1.17.5 Garments shall be permitted to be custom made, provided that the individual is measured for all dimensions cited in the sizing tables and that the garment provides the minimum ease specified in
Table 6.1.17.5. (old Table 6.1.17.6
6.1.17.6 The minimum seam allowance for all Major seams shall be at least 10 mm (3/8 in.), and all Minor seams shall be at least 6 mm (1/4 in.).
Substantiation: The current design requirements are design restrictive and force all manufacturers to provide clothing designed with the same dimensions. While there is a need for adequate "ease" in garments, this requirement can be addressed by provisions that dictate how users assess fit. In addition, no minimum sizing is provided for lower torso cold weather outwear.
Committee Meeting Action: Reject
Committee Statement: The inclusion of specific sizing provides "built in" ease for sizes. The ease provides a degree of thermal protection without additional ? layers and weight.

1977-33 Log #52 FAE-WFF **Final Action: Accept**
(6.1.17.4)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
Size requirements for tall sizes for upper-torso measurements as specified in Tables 6.1.17.3(a) and 6.1.17.3 ~~(c)~~ (d) shall have an additional 25 mm added to the sleeve length dimension and an additional 38 mm added to the front and back length dimensions.
Substantiation: Table 6.1.17.3(c) is for a lower torso protective garment. This requirement is only for upper-torso protective garments, therefore I believe that this should reference "a" and "d".
Committee Meeting Action: Accept

1977-34 Log #17 FAE-WFF **Final Action: Reject**
(6.2.2)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: ~~Helmets shall meet the requirements for Type 1 helmets of ANSI Z 89.1, Standard for Industrial Head Production.~~ (Delete paragraph 6.2.2).
Substantiation: The requirement for wildland helmets to meet the requirements in ANSI Z89.1 adds an unnecessary and in some cases redundant certification to the standard. Wildland helmets are already tested to some of the same requirements posed in ANSI Z89.1. In other cases, the requirements are slightly different between the two standards and therefore the additional testing does not net any advancement in wildland fire fighter safety.
Committee Meeting Action: Reject
Committee Statement: See Action taken on Comment 1977-35 (Log #124).

1977-35 Log #124 FAE-WFF **Final Action: Accept**
(6.2.2, 7.2.1, 7.2.2, 7.2.3, 8.11, 8.11.3.2, 8.11.4.1,8.11.5.1, 8,12, 8.12.3.2, 8.12.4.1, 8.12.5.1)

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
6.2 Helmets shall not have any metal hardware permanently mounted to the outer surface of the helmet shell.
6.2.2 Helmets shall meet as a minimum the requirements for Type 1, Class G helmets of ANSI Z89.1, Standard for Industrial Head Protection.
7.2.1 Specimen helmets shall be tested for resistance to top impact as specified in Section 8.11, Top Impact Resistance Test (Force) After Radiant Conditioning , and shall have no specimen transmit an average force of more than 3780 N (850 lbf). No individual specimen shall transmit a force of more than 4450 N (1000 lbf).
7.2.2 Helmets shall be tested for penetration resistance as specified in Section 8.12, Helmet physical Penetration Resistance Test After Radiation Conditioning , and the penetration striker shall not make contact with the headform as indicated by the contact indicator.
8.11 Top Impact Resistance Test (Force) After Radiant Conditioning .
8.11.3.2 Specimens shall be conditioned for ~~each~~ the environmental condition specified in ~~8.1.1, 8.1.3,~~ 8.1.4, ~~and 8.1.5~~ prior to each impact.
8.11.4.1 The apparatus shall be as specified in ANSI Z89.1, Standard for Industrial Head Protection.
[DELETE REMAINDER OF 8.11.4]
8.11.5.1 Testing shall be conducted in accordance with ANSI Z89.1, Standard for Industrial Head Protection.
[DELETE REMAINDER OF 8.11.5].
8.11.7.1 Disengagement of, deformation of, or damage to the helmet shell or component parts shall not in itself constitute a failure.
8.12 Helmet Physical Penetration Resistance Test After Radiant Conditioning .
8.12.3.2 Specimens shall be conditioned for ~~each~~ the environmental condition specified in ~~8.1.1, 8.1.3,~~ 8.1.4, ~~and 8.1.5~~ prior to each impact.
8.12.4.1 The apparatus shall be as specified in ANSI Z89.1, Standard for Industrial Head Protection.
[DELETE REMAINDER OF 8.12.4].
8.12.5.1 Testing shall be conducted in accordance with ANSI Z89.1, Standard for Industrial Head Protection.
[DELETE REMAINDER OF 8.12.5].
Substantiation: Current 6.2.2 is a performance requirement and should be moved to Chapter 7.
ANSI Z89.1 does not require force and penetration testing after radiant heat exposure.
Committee Meeting Action: Accept

1977-36 Log #16 FAE-WFF **Final Action: Reject**
(6.2.6)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: ~~The helmet complete with energy absorbing system, suspension system with sweatband, chin strap, nape device, goggle clips, and retroreflective markings shall not weigh more than 570 g (20 oz).~~ (Delete paragraph 6.2.6).
Substantiation: A minimum weight requirement for helmets is design restrictive. Without a thorough human factors study or adequate justification a minimum weight, the acceptable weight of wildland helmets should be determined through market factors.
Committee Meeting Action: Reject
Committee Statement: Submitter was present at the ROC meeting and requested that the Committee not consider this comment and instead consider his Comment 1977-37 (Log #119).

1977-37 Log #119 FAE-WFF **Final Action: Reject**
(6.2.6)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
The helmet complete with energy absorbing system, suspension system with sweatband, chinstrap, nape device, goggle clips, and retro-reflective marking shall not weigh more than ~~570 g (20 oz.)~~ 624 g (22 oz.).
Substantiation: A 20 oz minimum weight requirement for helmets is design restrictive. Most if not all current helmet manufacturer's full brim helmet offerings are very close to the current 20 oz. limit. This weight restriction limits a variations of a heaver reflective trim or even a 4 point chinstrap in some cases, which is popular with some Wildland Fire Fighters. A new limit of just 2 additional oz's would allow for various reflective trims which some department use for identification as well as a certified helmet that could be provided with a 4 point chinstrap.

Committee Meeting Action: Reject
Committee Statement: The current requirement of 20 oz is meeting user needs and user demands for 'lighter" rather than "heavier" helmets. Several different helmet styles that meet this requirement are available in the marketplace.

1977-38 Log #15 FAE-WFF **Final Action: Accept in Principle**
(6.2.8)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
6.2.8 Clips for headlamps or goggles shall be permanently attached with at least one clip at the rear of the helmet, and one clip on each side of the helmet. Clips shall be suitable located to retain straps and shall not be attached more than ~~55 mm (2 3/46 in.)~~ 73 mm (2 7/8 in.) above the lower edge of the helmet.
Substantiation: The current requirement is too restrictive in the placement of clips for full brim helmet designs.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-39 (Log #122).

1977-39 Log #122 FAE-WFF **Final Action: Accept**
(6.2.8)

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
6.2.8 Clips for headlamps or goggles shall be permanently attached with at least one clip at the rear of the helmet, and one clip on each side of hte helmet. Clips shall be suitably located to retain straps and shall not be attached more than 55 mm (2-3/16 in.) above the ~~lower edge of hte helmet~~ lowest point of the helmet dome, excluding the brim .
Substantiation: Clarification of required position for headlamp/goggle clips.
Committee Meeting Action: Accept

1977-40 Log #123 FAE-WFF **Final Action: Reject**
(6.2.9.1)

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
6.2.9.1 The suspension shall be adjustable ~~in 1/8 hat size or smaller increments~~ .
Substantiation: This requirement conflicts with current CE requirements forcing manufacturer's to use different headbands. Helmets will still be required to be adjustable.
Committee Meeting Action: Reject
Committee Statement: The substantiation is not accurate regarding CE requirements. The CE requirement is in smaller increments than 1/ 8 that size (U.S.).

1977-41 Log #109 FAE-WFF **Final Action: Reject**
(6.2.13)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Delete design requirement and replace with performance requirement.
Substantiation: The thread melting test should be used as a performance based test instead of using the design requirement of inherently flame resistant fiber thread. If the use of heat resistant thread is good enough for garments, it should also be good enough for use in the construction of the helmet. A separate comment has been submitted to include the performance requirement in 7.2.
Committee Meeting Action: Reject
Committee Statement: Submitter was present at the ROC meeting and requested the Committee not consider their comment.

1977-42 Log #6 FAE-WFF **Final Action: Reject**
(6.2.15 (New))

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Add new text to read as follows:
6.2.15 All helmets shall be shipped to the customer fully assembled.
Substantiation: The practice exists in some parts of the industry where the shell and suspensions are shipped to the customer without the helmet being fully assembled. In order to prevent incorrect installation (to ensure that the helmet meets the retention requirements of NFPA 1977), the helmet should be completely assembled when the end user receives the helmet.
Committee Meeting Action: Reject
Committee Statement: The Comittee feels the current practice is satisfactory. Purchasers can always put a requirement in bid requests for helmets to be delivered fully assembled or can purchase from manufacturers who supply them already assembled.

1977-43 Log #53 FAE-WFF **Final Action: Accept**
(Figure 6.4.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Properly identify the location of the vamp.
Substantiation: The vamp on the figure is not properly identified. The location should point to the instep of the boot not on the outside. The definition of the vamp is: Term for front part of shoe, covering toes and instep.
Committee Meeting Action: Accept
Committee Statement: Move "vamp" arrow to area of boot over toes.

1977-44 Log #175e FAE-WFF **Final Action: Reject**
(6.4.4)

Submitter: Vince Mazzier, BLM Operations
Comment on Proposal No: 1977-2
Recommendation: The following are comments reflecting the stance of the U.S. Bureau of Land Management (BLM) position on the sections referred:
Section 6.4.4 Footwear height shall be a minimum of 200 mm (8 in.).
Substantiation: The hard and fast determination that footwear must be a minimum of 200 mm or 8 inches in height is not a reality with differentiation in manufacturing and products. Many boots (Whites, Danners, etc.) vary slighly in make and model. Boots sold as 8 inch are at times 7 3/4 or 7 1/2 inches tall. We recommend the language be changed to say "Boots specified by the manufacturer to be eight inches or taller shall be the standard for wildland firefighter use."
Committee Meeting Action: Reject
Committee Statement: The requirement for 200 mm (8 in.) specifies where the measurement is taken in 6.4.4.1 and 6.4.4.2. The 200 mm (8 in.) height is a minimum and can be exceeded. Currently the requirement provides for a 200 mm (8 in.) or higher boot as the minimum.
Footwear that does not measure at least 200 mm (8 in.) as specified in 6.4.4.1 and 6.4.4.2 would not be in compliance with the standard and would not be certified.

1977-45 Log #54 FAE-WFF **Final Action: Accept**
(6.5.4.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Add new text as follows:
The shroud shall be donned properly on the helmet in the position that it is intended to be worn, as specified by the manufacturer, on each compliant wildland fire fighting helmet identified in 5.5.1.8(5).
Substantiation: Since the Face/Neck Shroud is a stand alone item, it should be evaluated with the specific helmet(s) with which it is intended to be worn. This should be done in order to ensure proper coverage and protection.
Committee Meeting Action: Accept

1977-46 Log #159 FAE-WFF **Final Action: Accept**
(6.6.5)

Submitter: Paul Broyles, US Department of the Interior-Natl Park Services
Comment on Proposal No: 1977-1
Recommendation: Remove requirement for Flame-Resistant Thread, 6.6.5.
Substantiation: Flame-resistant thread raises costs unnecessarily, and will cause the Wildland fire community to make major cost inventory changes unnecessarily. We've had no problems with existing thread being next to wearer's skin, and the material it's sewn to isn't flame-resistant.
Committee Meeting Action: Accept

1977-47 Log #170 FAE-WFF **Final Action: Accept**
(6.6.5)

Submitter: Les Holsapple, USDA Forest Service
Comment on Proposal No: 1977-1
Recommendation: Delete in it's entirety 6.6.5 - ~~All thread used to manufacture goggles shall be made of inherently flame-resistant fibers.~~
Substantiation: This requirement is inherently unnecessary as none of other materials are flame-resistant. Creates undue cost without providing substantiated protection. Could potentially reduce thread strength for durability.
Committee Meeting Action: Accept

1977-48 Log #175 FAE-WFF **Final Action: Accept**
(6.6.5)

Submitter: Vince Mazzier, BLM Operations
Comment on Proposal No: 1977-2
Recommendation: The following are comments reflecting the stance of the U.S. Bureau of Land Management (BLM) position on the sections referred:
Section 6.6.5 All thread used to manufacture goggles shall be made of inherently flame-resisant fiber.
Substantiation: The BLM operations community does not agree with this proposal in that it does not have any cost benefit nor improve safety in the use for which they are intended. These goggles meet ANSI Z87.1 requirements and are worn primarily for eye protection from flying debris or puncture. Fire resistant thread is not necessary since the rest of the materials are not fire resistant no is it cost effective.
Committee Meeting Action: Accept

1977-49 Log #187 FAE-WFF **Final Action: Accept**
(6.6.5)

Submitter: Tim Lynch, US Forest Services
Comment on Proposal No: 1977-2
Recommendation: I recommend that you remove the text requiring flame-resistant thread. FR thread will not improve this item, the material to which it is sewn is not FR. There have not been any reported problems with non-FR thread on this item, and it will increase cost and prevent some current approved goggles from use.
Substantiation: This recommendation is based on my experience as a wildland firefighter and equipment specialist for the USFS.
Committee Meeting Action: Accept

1977-50 Log #132 FAE-WFF **Final Action: Accept**
(6.7.3.2)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
Chain saw protectors... configured as ~~aprons,~~ chaps, or leggings...
Substantiation: F1897 was revised to eliminate an apron type configuration.
Committee Meeting Action: Accept

1977-51 Log #175d FAE-WFF **Final Action: Accept in Principle**
(6.7.4)

Submitter: Vince Mazzier, BLM Operations
Comment on Proposal No: 1977-2
Recommendation: The following are comments reflecting the stance of the U.S. Bureau of Land Management (BLM) position on the sections referred:
Section 6.7.4 Chain saw protectors that are designed to protect the feet shall meet the requirements of ASTM F 1818, Standard Specification for Foot Protection for Chain Saw Users.
Substantiation: The BLM operations community does not use nor recommend using the foot protection items described. There is potential for decreased movement and a tripping hazard associated with the use of these items. We concur with the forest Service that they should not be included in the standard.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-3 (Log #161).

1977-52 Log #133 FAE-WFF **Final Action: Reject**
(6.7.5)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
6.7.5 All thread used to manufacture chain saw <u>foot</u> protectors shall be made of inherently flame resistant thread.
Substantiation: This requirement is justified because chain saw foot protection is permanently attached to the footwear. The protective device must be able to meet the same performance characteristics as the Wildland fire fighting boots when oven tested.
Unlike chain saw foot protectors which is a permanent part of the footwear, chain saw leg protectors are quickly and easily removed by the wearer. While the material used on the interior of the leg protector to provide chain saw cut resistance is a para-aramid fiber, the outer shell material most commonly used is a heavy denier nylon twill fabric. The nylon thread used to manufacture leg protectors is the same as the thread used to manufacturer load carrying protective equipment.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-3 (Log #161).

1977-53 Log #169 FAE-WFF **Final Action: Accept**
(6.7.5)

Submitter: Les Holsapple, USDA Forest Service
Comment on Proposal No: 1977-1
Recommendation: Remove 6.7.5 - Flame Resistant Thread for Chain Saw Leg Protection.
Substantiation: This garment is not intended to be flame resistant. Rather we need to stay focussed on providing the greatest strength to protect the wearer's leg from the moving saw chain. Utilizing flame resistant thread may compromise strength.
Committee Meeting Action: Accept

1977-54 Log #162 FAE-WFF **Final Action: Accept**
(6.7.5, 7.7.4)

Submitter: Paul Broyles, US Department of the Interior-Natl Park Services
Comment on Proposal No: 1977-1
Recommendation: Remove 6.7.5 and 7.7.4 - Flame-Resistant Thread for Chain saw Leg Protection.
Substantiation: Chain saw chaps are not intended to be fire resistant (they get too much gas and oil spilled on them for that!!). They are intended to protect legs/shins for chain cuts. They should be removed prior to any sort of entrapment escape. Keeping this new requirement needlessly raises costs (major cost inventory replacement to wildland fire community) without one iota of protection gain to the wearer!!
Committee Meeting Action: Accept

1977-55 Log #184 FAE-WFF **Final Action: Accept**
(6.7.5, & 7.7.4)

Submitter: Tim Lynch, US Forest Services
Comment on Proposal No: 1977-2
Recommendation: I recommend that you remove any requirements for flame-resistant thread for chainsaw leg protection. Chainsaw chaps are not intended to be FR, their function is to provide cut protection. FR thread has not been tested with this product and could degrade performance. The outer layer of this product is not FR, so why does the thread need to be FR? This requirement will add cost with no benefit.
Substantiation: This recommendation is based on my experience as a wildland firefighter and Equipment Specialist for the USFS.
Committee Meeting Action: Accept

1977-56 Log #175b FAE-WFF **Final Action: Accept in Part**
(6.7.5 , 7.7.4)

Submitter: Vince Mazzier, BLM Operations
Comment on Proposal No: 1977-2
Recommendation: The following are comments reflecting the stance of the U.S. Bureau of Land Management (BLM) position on the sections referred:
Section 6.7.5 All thread used to manufacture chain saw protectors shall be made of inherently flame-resistant fiber.
Section 7.7.4 All sewing thread utilized in the construction of chain saw protectors shall be tested for resistance to melting as specified in Section 8.9, Thread Heat Resistance Test, and shall not ignite, melt, or char.
Substantiation: The BLM operations community does not agree with this proposal in that it does not have any cost benefit nor improve safety in the use for which they are intended. The effectiveness of these items is measured by their ability to limit damage to personnel when coming in contact with moving chainsaw cutting surfaces. They are not designed for nor are they intended to be a flame resistant item. The interaction of the design and their construction determine their effectiveness. The addition of this thread does not enhance their usefulness and may have a significant effect on the cost of this item.
Committee Meeting Action: Accept in Part
On 6.7.5, Accept
On 7.7.4 Reject.
Committee Statement: The Committee will retain a heat test for the thread, however will not be a FR requirement.
See actions taken on Comment 1977-98 (Log #135) and Comment 1977-99 (Log #168).

1977-57 Log #163 FAE-WFF **Final Action: Accept**
(6.8.5)

Submitter: Paul Broyles, US Department of the Interior-Natl Park Services
Comment on Proposal No: 1977-1
Recommendation: Remove 6.8.5 - Flame Resistant Thread for Load Carrying Systems.

Substantiation: Fire places/load carrying systems are not designed to be flame-resistant, and don't need to be - they are designed to carry loads, and to be removed prior to any sort of entrapment escape or shelter deployment. Requiring this standard unnecessarily decreases major costs to the wildland fire community with no protection gain at all to the wearer.
Committee Meeting Action: Accept

1977-58 Log #173 FAE-WFF **Final Action: Accept**
(6.8.5)

Submitter: Les Holsapple, USDA Forest Service
Comment on Proposal No: 1977-1
Recommendation: Remove 6.8.5 - Flame Resistant Thread for the Load Carrying Systems.
Substantiation: Any requirement for use of flame resistant is unnecessary due to the use of this equipment. Durability not flame resistance is the needed value of these items. During deployment these items would be discarded outside the shelter.
Committee Meeting Action: Accept

1977-59 Log #188 FAE-WFF **Final Action: Accept**
(6.8.5)

Submitter: Tim Lynch, US Forest Services
Comment on Proposal No: 1977-2
Recommendation: I recommend that you remove any requirements for flame-resistant thread for load-carrying systems. The outer layer of this product is not FR, so why does the thread need to be FR? This requirement will add cost with no benefit. The purpose of this item is carrying water, fire shelter, and other necessities. FR thread has not been tested with this item and may negatively affect performance.
Substantiation: Tis recommendation is based on my experience as a wildland firefighter and equipment specialist for the USFS.
Committee Meeting Action: Accept
Committee Statement: See action taken on Comment 1977-98 (Log #135).

1977-60 Log #175c FAE-WFF **Final Action: Accept in Principle**
(6.8.5)

Submitter: Vince Mazzier, BLM Operations
Comment on Proposal No: 1977-2
Recommendation: The following are comments reflecting the stance of the U.S. Bureau of Land Management (BLM) position on the sections referred:
Section 6.8.5. All thread used to manufacture load carrying protective equipment shall be made of inherently flame-resistant fiber.
Substantiation: The BLM operations community does not agree with this proposal in that it does not have any cost benefit nor improve safety in the use for which they are intended. The addition of flame resistant thread would not enhance the effectiveness of these items. They are intended for the carrying of equipment and not for inherent protection of the individual. Any durable material or fabric that can withstand the required temperature and rugged use will do.
Committee Meeting Action: Accept in Principle
Committee Statement: See actions taken on Comment 1977-60 (Log #135) and Comment 1977-99 (Log #168).

1977-61 Log #195 FAE-WFF **Final Action: Accept**
(6.9)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
~~6.9 Accessory Design Requirements~~
~~6.9.1 Any accessory attached to any item of wildland fire fighting protective clothing or equipment shall not interefere with the function of the item or with the function of any of the item's components.~~
~~6.9.2 In all cases, any accessory attached to an item of wildland fire fighting protective clothing or equipment shall not degrade the designated protection or performance of the item below the requirements of this standard.~~
Substantiation: Technical Correlating Committee (TCC) has instructed the NFPA 1977 Technical Committee that "Any Accessory Design Requirements currently found in the product standards be deleted."
These sections need to be deleted in accordance with the TCC.
Committee Meeting Action: Accept

1977-62 Log #102 FAE-WFF **Final Action: Accept in Principle**
(Chapter 7 & 8)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Review requirements for Cold Weather Liners and Cold Weather Outerwear. Ensure all testing is conducted for each item as intended.
Substantiation: Cold Weather Liners and Cold Weather Outerwear requirements are very confusing. Based on the definitions of garment and cold weather outerwear, I believe these are intended to be two separate items, not the same thing. From the language in the ROP it does not appear that Cold Weather Outerwear is tested to many of the performance requirements (such as flame and heat).
Committee Meeting Action: Accept in Principle
Revise text to read as follows:
7.1.2 Change cold weather liners to winter liners.
7.1.3 Change cold weather liners to winter liners.
7.1.4 Change cold weather liners to winter liners.
7.1.7 Change cold weather liners to winter liners.
7.1.8 Change cold weather liners to winter liners.
8.2.1.1 Delete cold weather outerwear.
8.4.8 Delete cold weather protective outerwear.
8.4.9 Delete cold weather protective outerwear.
8.4.1 Delete cold weather outerwear.
8.4.1.2 Delete cold weather outerwear.
8.4.1.3 Delete cold weather outerwear.
Committee Statement: The committee agrees with the submitter and provided the modified text.

1977-63 Log #34 FAE-WFF **Final Action: Accept**
(7.1.2, 7.1.2.1)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.1.2 Garment textile fabrics, collar linings, winter liners where provided, trim, lettering, and other materials used in garment construction - including, but not limited to, labels, linings, padding, reinforcements, bindings, hanger loops, emblems, and patches, but excluding hook and pile fasteners, elastic, and interlings where not in direct contact with the skin - shall be individually tested for resistance to flame as specified in Section 8.3, Flame Resistance Test, and shall not have a char length of more than 100 mm (4 in.) average, shall not have an afterflame of more than 2 seconds average, and shall not melt or drip.
7.1.2.1 Small specimens such as labels, hanger loops, emblems, and patches that are not large enough to meet the specimen size requirements in 8.3.2.1 shall be tested for resistance to flame as specified in Section 8.3, Flame Resistance Test, and shall not be totally consumed, shall not have an afterflame of more than 2 seconds average, and shall not melt or drip.
Substantiation: The proposed changes clarify the committee's intent to include labels for flame resistance testing (labels are currently not excluded).
Committee Meeting Action: Accept

1977-64 Log #43f FAE-WFF **Final Action: Accept in Principle**
(7.1.2, 7.1.5)

Submitter: Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment
Comment on Proposal No: 1977-2
Recommendation: The TCC directs the TC to include the following statement in 7.1.2 and 7.1.4 to address zippered closure systems:
"Zippers and seam-sealing materials shall meet the performance requirements specified in 7.1.2 only where located on the exterior of the garment or located where they will directly contact the wearer's body."
The TCC directs the TC to consider adding the following text to 7.1.5 as subparagraphs, or justify why it is not necessary:
"Zippers and seam-sealing materials shall meet the performance requirements specified in 7.1.5 only where located on the exterior of the garment or located where they will directly contact the wearer's body."
"Elastic and hook and pile fasteners shall meet the performance requirements specified in 7.1.5 only where located where they will directly contact the wearer's body."
Substantiation: The TCC sees that these same issues are addressed as noted in other product documents within the Project and feels that similar issues be addressed in the same manner for consistency unless the TC documents why this is not proper for NFPA 1977. The TC should revise text to have continuity of requirements.
Committee Meeting Action: Accept in Principle
Committee Statement: The TC will incorporate the zipper text but wildland garments do not incorporate seam sealing materials so that term was not included.

1977-65 Log #118 FAE-WFF **Final Action: Accept**
(7.1.6)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Garment composite, excluding cold weather outerwear garments, and excluding winter liners where provided, shall be tested for evaporative heat transfer as specified in Section 8.5, Total Heat Loss Test, and shall have a total heat loss of not less than ~~550~~ 450 W/m^2.
Substantiation: Historically, the RPP values in this standard have been based on what shirting materials can pass. The THL's have always been based on

what pant weight fabrics can pass. This should continue, as raising the THL may ultimately require materials that do not have the raggedness or extra RPP needed for wildland trousers. In the end this may lead to wildland fire fighters opting for clothing that does the job, and may forego NFPA 1977 to get it. The drive to contrive and add more and more increased testing requirements which are not related to operational issues may lead to the misfortune of this standard as well as others in this project which are struggling to gain traction in the fire fighting community.

Committee Meeting Action: Accept

1977-66 Log #165 FAE-WFF **Final Action: Accept**
(7.1.6)

Submitter: Joshua D. Moody, Westex, Incorporated
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
"... of not less than ~~550~~ 450 W/m^2."
Substantiation: The proposed change for the Total Heat Loss requirement from the existing 450 W/m^2 to an new value of 550 W/m^2 has the potential to exclude existing NFPA 1977 compliant fabrics from the marketplace. Additionally, the inherent variability in the test method can result in values swings up to 80 W/m^2. This variability as well as the requirement change will put existing products in jeopardy of not being compliant with NFPA 1977 requirements. What some might think is a simple change could put undue hardships on municipalities and contractors that rely on these garments for their protection.
Committee Meeting Action: Accept

1977-67 Log #176 FAE-WFF **Final Action: Accept in Principle**
(7.1.6)

Submitter: Christopher G. F. Corner, Southern Mills, Inc.
Comment on Proposal No: 1977-2
Recommendation: The THL numbers listed below are actual values for materials that are certified by UL for NFPA 1977. The proposed 2005 edition sets the minimum THL value at 550 W/m^2. As the cart below shows, some materials that are currently used in wildland fire fighting would not pass the recommended minimum value or would be borderline to passing the minimum value.

Substantiation:

Style	7.0 oz. 60/40 Kev/Nomex w/ DWR Finish		7.5 oz Nomex w/DWR Finish		7.5 oz. Nomex (Pain weave) w/ Wicking Finish		7.5 oz 60/40 kev/Pbi w/DWR Finish		7.5 oz Nomex (Till weave) w/Wicking Finish	
	Date	**THL**	**Date**	**THL**	**Date**	**THL**	**Date**	**THL**	**Date**	**THL**
	9/27/99	528.2	9/27/99	539.0	7/10/03	625.1	9/27/99	530.6	11/27/00	621.5
	11/22/00	538.1	4/9/02	569.5	11/22/00	605.9	11/22/00	525.9	9/9/99	562.8
	1/24/01	639.8					1/24/01	516.8	12/16/03	637.0
	12/16/03	533.9					7/10/03	569.9	6/18/02	606.0
	4/9/02	491.2					4/9/02	507.1		
Average		546.2		554.3		615.5		530.1		606.8
Min		491.2		539.0		605.9		507.1		562.8
Max		639.8		569.5		625.1		569.9		637.0
STD Dev		55.5		21.6		13.6		24.0		32.0
CV		10%		4%		2%		5%		5%

Committee Meeting Action: Accept in Principle
Committee Statement: See actions taken on Comment 1977-65 (Log #118) and Comment 1977-66 (Log #165).

1977-68 Log #166 FAE-WFF **Final Action: Accept**
(7.1.7)

Submitter: Joshua D. Moody, Westex, Incorporated
Comment on Proposal No: 1977-1
Recommendation: Add the following language:
" Woven garment textile fabrics..."
Substantiation: Adding the word "woven" will exclude the testing of knit fabrics for tear resistance. This test method is not appropriate for the testing of knitted fabrics.
Committee Meeting Action: Accept

1977-69 Log #31 FAE-WFF **Final Action: Accept in Principle**
(7.1.7.1, 8.X)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Add new paragraph 7.1.7.1:
7.1.7.1 Where garment textile fabrics, collar linings, and cold weather liners are knit materials, these materials shall instead be individually tested for burst strength as specified in 8.X, Burst Strength Test, and shall a burst strength of not less than 225 N (51 lbf).
Add test method 8.X (to be inserted where appropriate) as follows:
Substantiation: Elmendorf test resistance testing is inappropriate for knit fabrics. The proposed burst strength test provides an alternative method for their evaluation. The proposed requirement is one-half the requirement for knit hoods in NFPA 1971-2000.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-70 (Log #150)

1977-70 Log #150 FAE-WFF **Final Action: Accept**
(7.1.7.1 and 8.x (New))

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Add new paragraph 7.1.7.1:
7.1.7.1 Where garment textile fabrics, collar linings, and cold weather liners are knit materials, these materials shall instead be individually tested for burst strength as specified in 8.X, Burst Strength Test, and shall a burst strength of not less than 225 N (51 lbf).
Add attached test method 8-X (to be inserted where appropriate).
8.X Burst Strength Test.
8.X.1 Application. This test shall apply to knit materials used in protective garments and face/neck shrouds.
8.X.2 Specimens. A total of ten specimens shall be tested.
8.X.3 Sample Preparation.
8.X.3.1 Specimens shall be conditioned as specified in 8.1.1.
8.X.3.2 Samples for conditioning shall be 1-m (1-yd) square of material.
8.X.4 Procedure. Specimens shall be tested as specified in ASTM D 3787, *Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Ball Burst Testing Method* .
8.X.5 Report. The burst strength of each specimen shall be reported. The average burst strength of all specimens shall be calculated and reported.
8.X.6 Interpretation. The average burst strength shall be used to determine pass or fail performance.
Substantiation: Elmendorf test resistance testing is inappropriate for knit fabrics. The proposed burst strength test provides an alternative method for their evaluation. The proposed requirements is consistent with the requirements used for hood knit fabrics in NFPA 1971-2000.
Committee Meeting Action: Accept

1977-71 Log #164 FAE-WFF **Final Action: Reject**
(7.1.9.1)

Submitter: Joshua D. Moody, Westex, Incorporated
Comment on Proposal No: 1977-1
Recommendation: Change the requirements to read:
"...greater than ~~315 N~~ 225 N (~~70 lbf~~ 50 lbf) for Major seams, ~~225 N~~ 135 N (~~50 lbf~~ 30 lbf) force for Minor seams.
Substantiation: In my opinion, the original values for seam strength are overstated. In use, garment wear out (or physical failure) is generally seen within the body fabric and not within the seams.
Committee Meeting Action: Reject
Committee Statement: Long history has shown there are several textiles that meet and continue to meet these requirements without trouble.

1977-71a Log #CC2 FAE-WFF **Final Action: Accept**
(7.1.9.2)

Submitter: Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment
Comment on Proposal No: 1977-14
Recommendation: 7.1.9.2 renumber as 7.1.9.3.
Add new 7.1.9.2 to read as follows:
7.1.9.2 All knit garment seam assemblies shall demonstrate a sewn seam strength equal to or greater than 180 N (40 lbf).
Substantiation: Test method includes knit seams but the performance criteria omitted knit seam pass/fail.
Committee Meeting Action: Accept

1977-72 Log #108 FAE-WFF **Final Action: Accept**
(7.2.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new 7.2.1 to read as follows:
7.2.1 All sewing thread utilized in the construction of helmets, excluding that used on the crown straps, shall be tested for resistance to melting as specified in Section 8.9, Thread Heat Resistance Test, and shall not ignite, melt, or char.
Add new 7.6.2 to read as follows:
All sewing thread utilized in the construction of goggles shall be tested for resistance to melting as specified in Section 8.9, Thread Heat Resistance Test, and shall not ignite, melt, or char.
Renumber existing paragraphs
8.9.1.1 Application. This test method shall apply to each type of thread used in the construction of garments, ~~cold weather outerwear,~~ helmets, gloves, footwear, ~~and~~ face/neck shrouds, goggles, chainsaw protectors, and load carrying equipment.
8.9.1.2 Modifications to this test method for testing thread for use on goggles, chainsaw protectors and load carrying equipment shall be as specified in 8.9.5.4.
8.9.2 Remains as is.
8.9.3 Remains as is.
8.9.4 Remains as is.
8.9.5.1 Remains as is.
8.9.5.2 Remains as is.
8.9.5.3 Specific requirements for testing thread for use on garments, helmets, gloves, footwear, face/neck shrouds.
8.9.5.3.1 Following each successive determination of melting temperature for the reference material and for the test specimens, the stage in each case shall be cooled to at lest 230°C (450°F) before a new specimen is placed for testing.
8.9.5.3.2 The specimen shall be placed in a small mound on the cover glass and covered with another cover glass. The two cover glasses shall be pressed together, and placed in the circular depression on the stage. The temperature of the stage shall be raised to within 250°C (485°F) and thereafter at a rate of 2° to 3°C (3° to 4°F) per minute. At this rate of temperature rise, a slight pressure shall be applied on the upper glass cover by pressing with a spatula, pick needle or other instrument, so that the complete fiber is in contact with the cover plate.
8.9.5.3.3 When the temperature of the stage reaches 260°C, +3°/-0°C (500°F, +5°/-0°F), the specimen shall be observed with the aid of the magnifying glass for ignition, melting, or charring.
8.9.5.4 Specific requirements for testing thread for use on goggles, chainsaw protectors, and load carrying equipment.
8.9.5.4.1 Following each successive determination of melting temperature for the reference material and for the test specimens, the stage in each case shall be cooled to at least 205°C (400°F) before a new specimen is placed for testing.
8.9.5.3.2 The specimen shall be placed in a small mound on the cover glass and covered with another cover glass. The two cover glasses shall be pressed together, and placed in the circular depression on the stage. The temperature of the stage shall be raised to within 225°C (435°F) and thereafter at a rate of 2° to 3°C (3° to 4°F) per minute. At this rate of temperature rise, a slight pressure shall be applied on the upper glass cover by pressing with a spatula, pick needle or other instrument, so that the complete fiber is in contact with the cover plate.
8.9.5.3.3 When the temperature of the state reaches 232°C, +3/-0°C (450°F, +-0°F), the specimen shall be observed with the aid of the magnifying glass for ignition, melting or charring.
Delete current 8.9.5.4, 8.9.5.5 and 8.9.5.6.
8.9.6 remains as is.
8.9.7 remains as is.
Substantiation: There is a design requirement for use of inherently flame resistant fiber thread. However instead of this design requirement a performance requirement should instead be used as there is already a recognized test method developed and included in this standard for other items.
Committee Meeting Action: Accept

1977-73 Log #125 FAE-WFF **Final Action: Accept**
(7.2.4, 8.13, 8.13.1.1, 8.13.1.2, 8.13.2.1, 8.13.4.2, 8.13.5.2.1, 8.13.5.1, 8.13.5.1.1, 8.13.5.1.2)

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
7.2.4 ~~Helmets and any~~ Antiglare material, where provided as permitted in 6.2.7, shall be tested for flame resistance as specified in Section 8.13, Helmet Antiglare Flammability Test, and shall not show any visible afterflame time greater than 5 seconds.
8.13 Helmet Antiglare Flammability Test.
8.13.1.1 This test method shall apply to antiglare material on helmets, where provided as permitted in ~~8.2.4~~ 6.2.7 .
~~8.13.1.2 Helmets which are not provided with antiglare material shall be tested to Procedure A only.~~
8.13.2.1 A minimum of ~~five~~ three complete helmets shall be tested ~~for each of the tests in this section~~ .
8.13.4.2 Other apparatus equipment shall include a laboratory test stand, fume hood, and stopwatch. ~~The laboratory test stand shall be capable of holding the specimen helmet in both an inverted horizontal position and in the "as worn" position allowing flame contact as specified in 8.13.5.1.2 and 8.13.5.2.1 respectively.~~
[DELETE 8.13.5.1].
[DELETE 8.13.5.1.1].
[DELETE 8.13.5.1.2].
Substantiation: ANSI Z89.1 contains flame test requirements for helmet, but not on the antiglare material. Current wording should be changed to apply to the antiglare material only.
Committee Meeting Action: Accept

1977-74 Log #9 FAE-WFF **Final Action: Reject**
(7.2.11, 8.20 (New))

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.2.11 Specimens helmets shall be tested for electrical insulation as specified in Section 8.20, Electrical Insulation Test, and shall not have any electrical leakage exceed 3 mA.
Add related test method 8.20 (Section 6-10 from NFPA 1977-1998 Edition)

with following additions to application section: "Where sample helmet(s) have not permanent metal hardware mounted to the hardware shell, such helmets shall be tested to Test Procedure A. Where sample helmets(s) have permanent metallic hardware mounted to the shell, such helmets shall be tested to Test Procedure B."
Substantiation: No requirement is provided for helmet electrical insulation. The proposed criteria are consistent with the current edition of NFPA 1977.
Committee Meeting Action: Reject
Committee Statement: Electrical performance and testing is now covered by ANSI Z89.1
See action taken on Comment 1977-35 (Log #124).

1977-75 Log #4 FAE-WFF **Final Action: Accept**
(7.3.1)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.3.1 Gloves shall be tested for heat as specified in ~~Section 8.14, Glove Heat Resistance Test~~ Section 8.4, Heat and Thermal Shrinkage Test, and shall not separate, melt, ignite, or drip, and shall not shrink more than 10 percent in either direction after testing, shall be donnable and shall be flexible.
Substantiation: The test procedures for measuring glove heat and thermal shrinkage are now part of Section 8.4.
Committee Meeting Action: Accept

1977-76 Log #38 FAE-WFF **Final Action: Accept**
(7.3.5)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.3.5 Gloves shall be tested for resistance to cutting as specified in Section 8.23, Cut Resistance Test, and shall have a ~~cut distance resistance~~ distance of blade travel not ~~more~~ less than 25 mm (1 in.).
Substantiation: The incorrect terminology is used in describing the test result and the requirement is stated in the wrong direction.
Committee Meeting Action: Accept

1977-77 Log #55 FAE-WFF **Final Action: Accept in Principle**
(7.3.5)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
Gloves shall be tested for resistance to cutting as specified in Section 8.23, Cut Resistance Test, and shall have a ~~cut distance resistance~~ distance of blade travel of not more than 25 mm (1 in.).
Substantiation: Modification is to change to proper terminology for this test methodology.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-76 (Log #38).

1977-78 Log #36 FAE-WFF **Final Action: Accept**
(7.4.1, 7.4.2)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.4.1 Footwear shall be tested for resistance to heat as specified in Section 8.4, Heat and Thermal Shrinkage Resistance Test, and, excluding laces, shall have no part of the footwear melt, shall have no delamination of any part of the footwear, and shall have all ~~accessories~~ hardware remain functional.
7.4.2 Footwear metal parts shall be tested for resistance to corrosion as specified in Section 8.27, Corrosion Resistance Test. Metals inherently resistant to corrosion - including but not limited to stainless steel, brass, copper, aluminum, and zinc - shall show no more than light surface-type corrosion or oxidation. Ferrous metals shall show no corrosion of the base metals. ~~Accessories~~ Hardware shall remain functional.
Substantiation: References to accessories should be removed in the performance requirements of the standard since the standard is no longer referring to accessories.
Committee Meeting Action: Accept

1977-79 Log #37 FAE-WFF **Final Action: Accept**
(7.4.3)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.4.3 Footwear shall be tested for resistance to cutting as specified in Section 8.23, Cut Resistance Test, and shall have a ~~cut distance resistance~~ blade travel distance of not ~~more~~ less than 25 mm (1.0 in.).
Substantiation: The incorrect terminology is used in describing the test result and the requirement is stated in the wrong direction.
Committee Meeting Action: Accept

1977-80 Log #56 FAE-WFF **Final Action: Accept in Principle**
(7.4.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
Footwear shall be tested for resistance to cutting as specified in Section 8.23, Cut Resistance Test, and shall have a ~~cut distance resistance~~ distance of blade travel of not more than 25 mm (1 in.).
Substantiation: Modification is to change to proper terminology for this test methodology.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-79 (Log #37).

1977-81 Log #35 FAE-WFF **Final Action: Accept in Principle**
(7.4.9)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.4.9 Footwear, ~~with accessories other than laces in place~~ without laces, where present, shall be tested for resistance to flame as specified in Section 8.34, Flame Resistance Test for Footwear, and shall not have an afterflame greater than 2 seconds, and shall not melt, drip, or ignite.
Substantiation: References to accessories should be removed in the performance requirements of the standard since the standard is no longer referring to accessories.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-82 (Log #57)

1977-82 Log #57 FAE-WFF **Final Action: Accept**
(7.4.9)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
Footwear, ~~with accessories other than~~ without laces in place, shall be tested for resistance to flame..."
Substantiation: It is believed that based on the TCC's Notes to this TC the requirements for accessories will be removed. Therefore this change in text will be necessary.
Committee Meeting Action: Accept

1977-83 Log #33 FAE-WFF **Final Action: Accept**
(7.5.2, 7.5.2.1)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
7.5.2 Face/neck shroud textile fabrics, collar linings, cold weather liners where provided, trim, lettering, and other materials used in garment construction - including, but not limited to, labels, linings, padding, reinforcements, bindings, hanger loops, emblems, and patches, but excluding hook and pile fasteners, elastic, and interlings where not in direct contact with the skin - shall be individually tested for resistance to flame as specified in Section 8.3, Flame Resistance Test, and shall not have a char length of more than 100 mm (4 in.) average, shall not have an afterflame of more than 2 seconds average, and shall not melt or drip.
7.5.2.1 Small specimens such as labels, hanger loops, emblems, and patches that are not large enough to meet the specimen size requirements in 8.3. 2 .1 shall be tested for resistance to flame as specified in Section 8.3, Flame Resistance Test, and shall not be totally consumed, shall not have an afterflame of more than 2 seconds average, and shall not melt or drip.
Substantiation: The proposed changes clarify the committee's intent to include labels for flame resistance testing (labels are currently not excluded).
Committee Meeting Action: Accept

1977-84 Log #58 FAE-WFF **Final Action: Accept**
(7.5.4)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
Face/neck shroud textile fabrics and interlinings and other materials used in face/neck shroud construction, including but not limited to, padding reinforcements, labels, closures, fasteners and bindings, but excluding hook and pile fasteners and elastic where not in direct contact with the skin, shall be individually tested for resistance to heat as specified in Section 8.4, Heat and Thermal Shrinkage Resistance Test, and shall not melt, drip, separate, or ignite. In addition, ~~garment~~ face/neck shroud outer shell textile fabrics shall not char.

Substantiation: This section references face neck shrouds not garments.
Committee Meeting Action: Accept

1977-85 Log #30 FAE-WFF **Final Action: Accept in Principle**
(7.5.6.1, 8.X)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Add new paragraph 7.1.7.1:
7.1.7.1 Where face/neck shroud fabrics are knit materials, these materials shall instead be individually tested for burst strength as specified in 8.X, Burst Strength Test, and shall a burst strength of not less than 168 N (25 lbf).
Add test method 8.X (to be inserted where appropriate) as follows:
8.X Burst Strength Test.
8.X.1 Application. This test shall apply to knit materials used in protective garments and face/neck shrouds.
8.X.2 Specimens. A total of ten specimens shall be tested.
8.X.3 Sample Preparation.
8.X.3.1 Specimens shall be conditioned as specified in 8.1.2.
8.X.3.2 Samples for conditioning shall be 1-m (1-yd) square of material.
8.X.4 Procedure. Specimens shall be tested as specified in ASTM D 3787, Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics - Ball Burst Testing Method.
8.X.5 Report. The burst strength of each specimen shall be reported. The average burst strength of all specimens shall be calculated and reported.
8.X.6 Interpretation. The average burst strength shall be used to determine pass or fail performance.
Substantiation: Elmendorf test resistance testing is inappropriate for knit fabrics. The proposed burst strength test provides an alternative method for their evaluation. The proposed requirement is one-half the requirement for knit hoods in NFPA 1971-2000.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-31 (Log #51).

1977-86 Log #151 FAE-WFF **Final Action: Accept**
(7.5.6.1 and 8.x (New))

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Add new paragraph 7.5.6.1:
7.5.6.1 Where face/neck shroud fabrics are knit materials, these materials shall instead be individually tested for burst strength as specified in 8.X, Burst Strength Test, and shall a burst strength of not less than 168 N (25 lbf).
Add the following test method 8-X (to be inserted where appropriate).
8.X Burst Strength Test.
8.X.1 Application. This test shall apply to knit materials used in protective garments and face/neck shrouds.
8.X.2 Specimens. A total of ten specimens shall be tested.
8.X.3 Sample Preparation.
8.X.3.1 Specimens shall be conditioned as specified in 8.1.1.
8.X.3.2 Samples for conditioning shall be 1-m (1-yd) square of material.
8.X.4 Procedure. Specimens shall be tested as specified in ASTM D 3787, *Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Ball Burst Testing Method* .
8.X.5 Report. The burst strength of each specimen shall be reported. The average burst strength of all specimens shall be calculated and reported.
8.X.6 Interpretation. The average burst strength shall be used to determine pass or fail performance.
Substantiation: Elmendorf test resistance testing is inappropriate for knit fabrics. The proposed burst strength test provides an alternative method for their evaluation. The proposed requirement is one-half the requirement for knit hoods in NFPA 1971-2000.
Committee Meeting Action: Accept

1977-87 Log #160 FAE-WFF **Final Action: Reject**
(7.6)

Submitter: Paul Broyles, US Department of the Interior-Natl Park Services
Comment on Proposal No: 1977-1
Recommendation: Regarding 7.6 exceeding ANSI Z87.1 Standard for Goggles - need to remove all requirements exceeding ANSI Z87.1.
Substantiation: ANSI Z87.1 requirements have been shown over time to be adequate. Raising standard will force Wildland fire community to make major cost inventory expenditures unnecessarily. Wearers would be severely injured prior to any heat levels required to melt existing standard goggles. There've been no substantive rationale to raise the existing standard.
Committee Meeting Action: Reject
Committee Statement: See also action taken on Comment 1977-94 (Log #60) that removes 7.6.2.

1977-88 Log #171 FAE-WFF **Final Action: Reject**
(7.6)

Submitter: Les Holsapple, USDA Forest Service
Comment on Proposal No: 1977-1
Recommendation: Proposal: Section 7.6 - Remove all requirements that exceed ANSI Z87.1.
Substantiation: Because the heat load required to ignite the ANSI Z87.1 requirement is already above the level of human tolerance we would be creating an unnecessary level of perceived protection without substantiation.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-87 (Log #160).

1977-89 Log #186 FAE-WFF **Final Action: Reject**
(7.6)

Submitter: Tim Lynch, US Forest Services
Comment on Proposal No: 1977-2
Recommendation: I recommend that you remove any requirements that would exceed ANSI standard Z87.1 The current ANSI Z87.1 heat resistance standard is sufficient. There is no information that would indicate the current standard is a problem, this item is in contact with the wearer's skin and the wearer would be injured or killed before deterioration of the goggle.
Substantiation: This recommendation is based on my experience as a wildland firefighter and equipment specialist for the USFS.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-87 (Log #160).

1977-90 Log #175a FAE-WFF **Final Action: Reject**
(7.6)

Submitter: Vince Mazzier, BLM Operations
Comment on Proposal No: 1977-2
Recommendation: The following are comments reflecting the stance of the U.S. Bureau of Land Managent (BLM) position on the sections referred:
Section 7.6 Protective Goggle peformance Requirements.
Substantiation: The BLM operations community does not agree with this proposal in that it does not have any cost benefit nor improve safety in the use for which they are intended. Goggles for wildland fire fighting as tested under ANSI Z87.1 are adequate for their intended use and would not require more stringent testing for heat resistance, optical clarity, or scratch resistance than is currently being done. The heat environment that fire fighters would find themselves prior to the failure of these goggles would already put them at risk for serious injury and more resistant goggles would not be a safety improvement.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-87 (Log #160).

1977-91 Log #59 FAE-WFF **Final Action: Accept**
(7.6.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Add to the end of the paragraph, "The test subject shall be able to read 20/100 on the standard eye chart".
Delete 7.6.2 and delete 8.37
Substantiation: The test method indicates an evaluation of the optical clarity (8.4.15.11) is to be conducted however there is no pass or fail requirement for this in the performance paragraph. Test method 8.37 is a duplicate of 8.4.15.
Committee Meeting Action: Accept

1977-92 Log #183 FAE-WFF **Final Action: Reject**
(7.6.1)

Submitter: John Dondero, Eve Safety Systems Inc. (ESS)
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
Goggles shall be tested for heat resistance as specified in Section ~~8.4 Heat and Thermal Resistance Test~~ (8.4.15 Specific Testing Requirements for Protective Goggles) and shall show...
Substantiation: The Section 8.4 is not the specific section relative to this test.
Committee Meeting Action: Reject
Committee Statement: Section 8.4 is the appropriate test method with certain modifications stated in 8.4.15. (See 8.4.1.8)

1977-93 Log #182 FAE-WFF **Final Action: Accept in Principle**
(7.6.2)

Submitter: John Dondero, Eve Safety Systems Inc. (ESS)
Comment on Proposal No: 1977-2
Recommendation: Goggles shall be tested (for) optical clarity, and distortion as specified in Section 8.37 Optical Clarity Test, and the test subject shall be able to read 20/100 on the standard eye chart (with either eye).

Substantiation: The word "for" is needed for proper sentence structure. The requirement of reading the chart "with either eye" is needed to ensure that goggle lenses can withstand the heat resistance test and provide clear vision through both eyes.
Committee Meeting Action: Accept in Principle
Revise 7.6.1 (as already revised by action taken on 1977- (Log #59) to read:
"... read 20/100 on the standard eye chart with each eye."
Committee Statement: The pass/fail criteria was moved from 7.6.2 to 7.6.1 by action taken on Comment 1977-91 (Log #59).

1977-94 Log #60 FAE-WFF **Final Action: Accept**
(7.6.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Delete 7.6.3.
Substantiation: There is no test to determine performance.
Committee Meeting Action: Accept

1977-95 Log #32 FAE-WFF **Final Action: Reject**
(7.6.3, 8.38)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Change 7.6.3 to read:
7.6.3 Goggles lenses shall be tested for resistance to scratching as specified in Section 8.38, Faceshield/Goggle Component Lens Scratch Resistance Test, and shall not exhibit a delta haze of greater than 25 percent.
Add test method (8.38) to read as follows:
8.38 Faceshield/Goggle Component Lens Scratch Resistance Test.
8.38.1 Application. This test method shall apply to goggles lenses.
8.38.2 Specimens. A minimum of four goggle lenses shall be selected.
8.38.3 Sample Preparation.
8.38.3.1 Specimens shall be conditioned as specified in 8.1.1.
8.38.3.2 Samples for conditioning shall be faceshield/goggle component lenses.
8.38.3.3 Seven samples shall be chosen from a minimum of four lenses. Four samples shall be taken from the left viewing area and three samples shall be taken from the right viewing area. One of the four samples taken from the left viewing area shall be the setup area.
8.38.3.4 The left viewing area test samples shall include all of the following criteria:
(1) The sample shall be a square measuring 51 mm x 51 mm (2 in. x 2 in.).
(2) Two edges of the square section shall be parallel within ±2 degrees of the axis of the cylinder or cone in the center of the sample.
(3) The sample shall be taken from the left side of the faceshield/goggle component lens and shall, as a minimum, contain that portion of the lens that is directly in front of the pupil of the left as defined by positioning a complete faceshield/goggle component in accordance with the eye/face positioning index on an Alderson 50th-percentile male headform.
8.38.3.5 The right viewing area test samples shall include all of the following criteria:
(1) The sample shall be a square measuring 51 mm x 51 mm (2 in. x 2 in.).
(2) Two edges of the square section shall be parallel within ±2 degrees of the axis of the cylinder or cone in the center of the sample.
(3) The sample shall be taken from the right side of the faceshield/goggle component lens and shall, as a minimum, contain that portion of the lens that is directly in front of the pupil of the right eye as defined by positioning a complete faceshield/goggle component in accordance with the eye/face positioning index on an Alderson 50th-percentile male headform.
8.38.3.6 Each of the samples shall be cleaned in the following manner:
(1) The sample shall be rinsed with clean tap water.
(2) The sample shall be washed with a solution of nonionic, low-phosphate detergent and water using a clean, soft gauze pad.
(3) The sample shall be rinsed with clean tap water.
(4) The sample shall be blown dry with filtered compressed air or nitrogen.
8.38.4 Apparatus.
8.38.4.1 The faceshield/goggle component lens scratch test apparatus shall be constructed in accordance with Figure 8.38.4.1. (see Figure 6-23.4.1 in NFPA 1971-2000)
8.38.4.2 The sample holder shall be configured with a flat surface under the lens or with an inner radius support.
8.38.4.3 The pad holder shall consist of a cylinder 10 mm (0.38 in.) high and 25 mm (1 in.) in diameter with a radius of curvature equal to the radius of curvature of the outside of the lens in the viewing area ±0.25 diopter. This cylinder shall be rigidly affixed to the stroking arm by a No. 10-32 UNF threaded rod.
8.38.4.4 The pad shall be a Blue Streak M306M or equivalent wool felt polishing pad 30 mm (1 3/16 in.) in diameter.
8.38.4.5 The abrasive disc shall be made from 3M Part No. 7415, Wood Finishing Pad or equivalent. A disc 25 mm (1 in.) in diameter shall be cut from the abrasive sheet.
8.38.5 Procedure.
8.38.5.1 The haze of the sample shall be measured using a haze meter in accordance with ASTM D 1003, Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics, and shall be recorded as follows:
(1) The haze shall be measured in the center of the sample ±1.6 mm (±1/16 in.).
(2) The sample shall be repositioned to achieve the maximum haze value within the area specified in 8.38.5.1(1).
(3) The haze meter shall have a specified aperture of 22.3 mm (0.88 in.).
(4) The haze meter shall have a visual display showing 0.1 percent resolution.
(5) The haze meter shall be calibrated before and after each day's use following the procedures outlined in ASTM D 1003, Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
8.38.5.2 The setup sample shall be placed cover side up in the test apparatus sample holder.
8.38.5.3 The pad holder, pad, and abrasive disc shall be installed on the stroking arm. The stroking arm shall be leveled to ±3 degrees by adjusting the threaded pin. The pin shall be secured to prevent rotation of the pad holder. The axis of curvature of the pad holder shall be coincident with the axis of curvature of the lens.
8.38.5.4 The stroking arm shall be counterbalanced with the pad holder, pad, and abrasive disc in place.
8.38.5.5 The setup sample shall be replaced with one of the six samples to be tested.
8.38.5.6 A test weight of 1 ±8 g (2.2 lb, ±0.2 oz) shall be installed on the pin above the test sample.
8.38.5.7 The test shall be run for 200 cycles, ±1 cycle. One cycle shall consist of a complete revolution of the eccentric wheel.
8.38.5.8 The length of stroke shall be 14 mm (0.56 in.), producing a pattern 38 mm (1 1/2 in.) long. The frequency of the stroke shall be 60 cycles/min, ±1 cycle/min. The center of the stroke shall be within 1.6 mm (±1/16 in.) of the center of the sample.
8.38.5.9 The sample shall be removed and cleaned following the procedures specified in 8.38.3.6. The abrasive disc shall be discarded.
8.38.5.10 The testing steps specified in 8.38.5 shall be repeated five additional times with a new sample and abrasive disc.
8.38.6 Report.
8.38.6.1 After each of the six samples have been tested and cleaned, the haze of the sample shall be measured following the procedure specified in 8.38.5.1.
8.38.6.2 The delta haze shall be calculated by subtracting the initial haze measurement from the final haze measurement.
8.38.7 Interpretation. The average of six delta haze values shall be used to determine pass/fail performance.
Substantiation: The test method is missing from the standard. The proposed requirement is too sever for the proposed test method.
Committee Meeting Action: Reject
Committee Statement: See action taken on Comment 1977-94 (Log #60)

1977-96 Log #185 FAE-WFF **Final Action: Accept**
(7.7)

Submitter: Tim Lynch, US Forest Services
Comment on Proposal No: 1977-2
Recommendation: I recommend that you remove any requirements for chainsaw foot protection. Historical data does not indicate that this is or has been a problem. overboots or permanent attachments would become a bigger hazard for firefighters because of weight and tripping hazards. Mobility is a major safety issue for firefighters, and this requirement would detract from safety.
Substantiation: This recommendation is based on my experience as a wildland firefighter and Equipment Specialist for the USFS.
Committee Meeting Action: Accept
Committee Statement: See action taken on Comment 1977-3 (Log #161).

1977-97 Log #134 FAE-WFF **Final Action: Reject**
(7.7.2)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Delete current wording and change as follows:
7.7.2 Fabrics which are used specifically to provide the chain saw cut resistance in chain saw leg protectors and chain saw foot protectors shall be tested for flame resistance as specified in Section 8.3, without being subjected to any laundering; and also tested for heat resistance as specified in Section 8.4, Heat and Thermal Resistance test, and shall not melt, drip, separate, or ignite and shall remain functional.
7.7.2.1 Materials which are used to encapsulate the fabrics which provide chain saw cut resistance in chain saw foot protectors shall be tested for flame resistance as specified in Section 8.3 without being subjected to any laundering; and also tested for heat resistance as specified in Section 8.4, Heat and Thermal Resistance test, and shall not melt, drip, separate, or ignite and shall remain functional.
7.7.2.2 Materials which are used to encapsulate the fabrics which are used to provide chain saw cut resistance on chain saw leg protectors shall be tested as indicated for load carrying protective equipment in 8.4.14.

Substantiation: As noted in comments related to Section 6.7.5, there is a difference between the removable chain saw leg protectors and the permanently attached chain saw foot protectors.
Committee Meeting Action: Reject
Committee Statement: Also foot protection was deleted by action taken on Comment 1977-3 (Log #161).

1977-98 Log #135 FAE-WFF **Final Action: Accept in Principle in Part**
(7.7.4)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
7.7.4 All sewing thread utilized int he construction of chain saw protectors shall be tested for resistance to melting as specified in Section 8.9, Thread Heat Resistance Test, and shall not ignite, melt or char.
Additional clarification is needed:
7.7.4.1 Sewing thread used for chain saw leg protectors shall be tested at a temperature of 450°F.
7.7.4.2 Sewing thread used for chain saw foot protectors shall be tested at a temperature of 500°F.
Substantiation: Those proposed changes reflect earlier comments related to Section 6.7.5 and 7.7.2.
Committee Meeting Action: Accept in Principle in Part
Committee Statement: 1. The Committee agrees with the temperature change to 450° F, but will add this change to the test method, where it belongs in Section 8.9.
2. The Committee rejects the part concerning "foot protectors" as these were deleted by action taken on 1977-3 (Log #161).

1977-99 Log #168 FAE-WFF **Final Action: Reject**
(7.7.4)

Submitter: Les Holsapple, USDA Forest Service
Comment on Proposal No: 1977-1
Recommendation: Remove 7.7.4 - Flame Resistant Thread for Chain Saw Leg Protection.
Substantiation: This garment is not intended to be flame resistant. Rather we need to stay focused on providing the greatest protection of wearer's leg from the moving saw chain. Utilizing flame resistant thread may compromise protective strength and durability.
Committee Meeting Action: Reject
Committee Statement: See action taken on 1977-98 (Log #135).
The change in test temperature causes this test not to define flame resistant thread, but a reasonably stable thread in heated environment.

1977-100 Log #1 FAE-WFF **Final Action: Hold**
(Chapter 8)

Submitter: Daniel Gohlke, W.L. Gore & Assoc., Inc.
Comment on Proposal No: 1977-2
Recommendation: Reorganize paragraphs on Sample Preparation into the following format.
X.X.2 Sample Preparation
X.X.2.1 What is the sample
X.X.2.2 How is it conditioned
X.X.2.3 Other information
X.X.3 Specimens
X.X.3.1 What is the specimen
X.X.3.2 How many are tested
X.X.3.3 Other information
Substantiation: This revision will provide clarity completeness, and consistency in addressing these topics. I am sure you will find, if you undertake this revision. That in many cases this information is presented in an inconsistent and incomplete fashion, leading to variation in understanding what is expected.
Committee Meeting Action: Hold
Committee Statement: In the abbreviated time the Committee has to process Comments, there was insufficient time to adequately address the complexity of the issued raised by this comment.

1977-101 Log #61 FAE-WFF **Final Action: Reject**
(8.1.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text as follows:
Room Temperature Conditioning Procedure for Protective Garments, Trim, Helmets, Load Carrying Equipment, Gloves, Footwear, Goggles, and Chain Saw Leg or Foot Protection.
Substantiation: I believe the intent is to allow for leg or foot protectors in the Chain Saw Protector products.
Committee Meeting Action: Reject
Committee Statement: Chain saw protection has been deleted by action taken on 1977-3 (Log #161).

1977-102 Log #14 FAE-WFF **Final Action: Accept**
(8.1.1.1)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.1.1.1 Garment, helmet, load carrying equipment, glove ~~and~~ footwear, goggles, and chain saw leg protection specimens shall be conditioned at a temperature of 21°C, ±3°C (70°F, ±5°F) and a relative humidity of 65 percent, ±5 percent, until equilibrium is reached, as determined in accordance with ASTM D 1776, Standard Practice for Conditioning Textiles for Testing, or for at least 24 hours, whichever is shorter. Specimens shall be tested within 5 minutes after removal from conditioning.
Substantiation: This paragraph is not consistent with its title or the application of room conditioning within the standard.
Committee Meeting Action: Accept

1977-103 Log #167 FAE-WFF **Final Action: Accept**
(8.1.2.2)

Submitter: Joshua D. Moody, Westex, Incorporated
Comment on Proposal No: 1977-1
Recommendation: This section should be deleted.
Substantiation: The AATCC 124 detergent is no longer manufactured by AATCC. It has been discontinued. The appropriate detergent is specified within the AATCC 135 Test Method and this extra reference to detergents is not needed.
Committee Meeting Action: Accept

1977-104 Log #13 FAE-WFF **Final Action: Reject**
(8.1.3, 8.1.6 (new))

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Move current 8.1.3 and renumber as 8.1.6; insert new 8.1.3:
8.1.3 Low Temperature Environmental Conditioning Procedure for Helmets.
8.1.3.1 Sample helmets shall be conditioned by exposing them to a temperature of -18°C, ±1°C (0°F, ±2°F) for at least 4 hours, but not more than 24 hours. The impact/penetration test shall be completed within 15, +5 seconds after removal from the cold temperature environment, or the helmet shall be reconditioned and tested as above.
Substantiation: The low temperature conditioning requirement for helmets is missing from the standard and was inadvertently replaced with a conditioning method applicable to trim.
Committee Meeting Action: Reject
Committee Statement: Conditioning now covered by ANSI Z89.1
See action taken on Comment 1977-35 (Log #124).

1977-105 Log #29 FAE-WFF **Final Action: Accept**
(8.1.3.1)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.1.3.1 Samples shall be conditioned by exposing them to the procedures specified in 8.4.5 with the following modifications:
(a) The oven test temperature in 8.4.5.4 shall be stabilized at 260°C, +6/-0°C (500°F, +10/-0°F) and the text exposure shall be 5 minutes, +15/-0 seconds.
(b) The test exposure time shall begin when the test thermocouple reading has stabilized at the required test exposure temperature.
(c) The requirements of 8.4.5.5 and 8.4.5.6 shall be disregarded.
Substantiation: The paragraph reference is missing.
Committee Meeting Action: Accept

1977-106 Log #62 FAE-WFF **Final Action: Accept**
(8.1.3.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
Samples shall be conditioned by exposing them to the procedures specified in *8.4.5 with the following modifications:
(a) The oven test temperature in 8.4.5.4 shall be stabilized at ~~260°C, +6/-0°C (500°F, +10/0°F)~~ 140°C, +6/-0°C (285°F, +10/-0°F) and the test exposure shall be 10 minutes, +15/-0 seconds.
Substantiation: In order to be consistent with other standards trim preconditioning for the convective heat exposure should be 140°C.
Committee Meeting Action: Accept

1977-107 Log #63 FAE-WFF **Final Action: Accept**
(8.1.4.12.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
The helmet shall be subjected to the exposure conditions specified in ~~8.1.4.1~~ 8.1.4.2 for the time recorded in 8.1.4.10.2.
Substantiation: Incorrect reference cited.
Committee Meeting Action: Accept

1977-108 Log #64 FAE-WFF **Final Action: Accept**
(8.1.5)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Delete entire section.
Substantiation: This same preconditioning is outlined in 8.1.3. Unless this is preconditioning for an item other than trim the section should be deleted. If it is for an item other than trim the title and specific conditioning temperature should be reviewed.
Committee Meeting Action: Accept

1977-109 Log #12 FAE-WFF **Final Action: Reject**
(8.1.5, 8.1.8)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Move current 8.1.5 and renumber as 8.1.6; insert new 8.1.5:
8.1.5 Wet Conditioning Procedure for Helmets.
8.1.5.1 Sample helmets shall be conditioned by immersing them in water at a temperature of 20°C to 28°C (68°F to 82°F) for at least 4 hours, but not more than 24 hours. The helmet shall be tested within 10 minutes after removal from water.
Substantiation: The wet conditioning requirement for helmets is missing from the standard and was inadvertently replaced with a conditioning method applicable to trim.
Committee Meeting Action: Reject
Committee Statement: Conditioning now covered by ANSI Z89.1
See action taken on Comment 1977-35 (Log #124).

1977-110 Log #65 FAE-WFF **Final Action: Accept**
(8.2.1.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Delete the second 8.2.1.3 shown in the ROP.
Substantiation: Redundant text.
Committee Meeting Action: Accept

1977-111 Log #189 FAE-WFF **Final Action: Accept**
(8.2.4.1.)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
8.2.4.1 The test apparatus specified in ASTM F 1939, Standard Test Method for Radiant Protective performance of Flame Resistant Clothing Materials, shall be used with the following modifications:
(a) The vertically oriented radiant shall consist of a bank of five, 500 W infrared, tubular, quartz lamps having a 125 mm (5 in.) lighted length and a mean overall length of 225 mm (8 3/4 in.)
(b) The control of the radiant heat source shall be permitted to be a variable transformer.
(c) The means for affixing the sample holder shall be permitted to be by any means that achieves the required specimen positioning in the test apparatus.
~~8.2.4.2~~ (d) No additional materials shall be placed between the radiant lamps and the sample (i.e. a protective screen).
Substantiation: The translucent quartz lamps specified in ASTM F 1939 are no longer available. Transparent lamps having the same characteristics are available and have been shown to provide equivalent results. Other apparatus design features can be varied to achieve the same testing consistencey without meeting all of the details provided in Figure 1 of ASTM F 1939.
Committee Meeting Action: Accept

1977-112 Log #26 FAE-WFF **Final Action: Accept**
(8.2.5.1)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.2.5.1 Radiant protective performance testing shall be performed in accordance with ASTM F 1939, Standard Test Method for Radiant Protective Performance of Flame Resistant Clothing Materials , at a radiant heat exposure level of 21 kW/m^2 s (0.5 cal/cm^2 s).
Substantiation: Wrong units; spelling corrections.
Committee Meeting Action: Accept

1977-113 Log #28 FAE-WFF **Final Action: Accept**
(8.4)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Make changes to Heat and Thermal Shrinkage Resistance Test Method as follows:
8.4 Heat and Thermal Shrinkage Resistance Test.
8.4.1 Application.
8.4.1.1 This test method shall apply to garment textiles, trim, label materials, and hardware; helmets; gloves; footwear; face/neck shroud textiles; load carrying equipment; goggles and goggle straps; and chain saw leg protectors.
8.4.1.2 Modifications to this test method for testing garment, and face/neck shroud textiles shall be as specified in 8.4.8.
8.4.1.3 Modifications to this test method for other garments, and face/neck shroud materials, trim, and label materials shall be as specified in 8.4.9.
8.4.1.4 Modifications to this test method for testing helmets shall be specified in 8.4.11.
8.4.1.5 Modifications to this test method for testing gloves shall be as specified in 8.4.12.
8.4.1.6 Modifications to this test method for testing footwear shall be as specified in 8.4.13.
8.4.1.7 Modifications to this test method for testing load carrying equipment shall be as specified in 8.4.14.
8.4.1.8 Modifications to this test method for testing goggles shall be as specified in 8.4.15.
8.4.1.9 Modifications to this test method for testing chain saw leg protectors shall be as specified in 8.4.16.
8.4.2 Specimens.
8.4.2.1 Both heat and thermal shrinkage resistance testing shall be conducted on a minimum of three specimens for each garment and face/neck shroud textile.
8.4.2.2 Each separable layer of multilayer material systems or composites shall be tested as an individual layer.
8.4.2.3 Only heat resistance testing shall be conducted on a minimum of three specimens for each hardware item, helmet, footwear, load carrying equipment, goggles straps, and chain saw leg protectors.
8.4.3 Sample Preparation. All specimens to be tested shall be conditioned as specified in 8.1.1.
8.4.4 Apparatus.
8.4.4.1 the test oven shall be a horizontal flow circulating oven with minimum interior dimensions so that the specimens can be suspended and are at least 50 mm (2 in.) from any interior oven surface or other test specimens.
8.4.4.2 The test oven shall have an airflow rate of 38 m/min to 76 m/min (125 ft/min to 250 ft/min) at the standard temperature and pressure of 21°C (70°F) at 1 atmosphere, measured at the center point of the oven.
8.4.4.3 A test thermocouple shall be positioned so that it is level with the horizontal centerline of a mounted sample specimen.
8.4.4.4 The thermocouple shall be equidistant between the vertical centerline of a mounted specimen placed in the middle of the oven and the oven wall where the airflow enters the test chamber.
8.4.4.5 The thermocouple shall be an exposed bead, Type J or Type K, No. 30 AWG thermocouple.
8.4.4.6 Unless otherwise specified for the specific item, the test oven shall be heated and the test thermocouple stabilized at 260°C, +6/-0°C (500°F, +10°/-0°F) for a period of not less than 30 minutes.
8.4.5 Procedure.
8.4.5.1 Specimen marking and measurements shall be conducted in accordance with the procedure specified in AATCC 135, Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics.
8.4.5.2 The specimen shall be suspended at the top and centered in the oven so that the entire specimen is not less than 50 mm (2 in.) from any oven surface or other specimen, and air is parallel to the plane of the material.
8.4.5.3 The oven door shall not remain open more than 15 seconds. The air circulation shall be shut off while the door is open and turned on when the door is closed. The total oven recovery time after the door is closed shall not exceed 30 seconds.
8.4.5.4 The specimen, mounted as specified, shall be exposed in the test oven for 5 minutes, +15/-0.0 ~~minutes~~ seconds. The test exposure time shall begin when the test thermocouple recovers to a temperature of 260°C, +6°/-0°C, (500°F, +10°/-0°F) or other temperature specific to the item as specified.
8.4.5.5 Immediately after the specified exposure, the specimen shall be removed and examined for evidence of ignition, melting, dripping, or separation.
8.4.5.6 After the specified exposure, the specimen also shall be measured to determine pass/fail. Knit fabric shall be pulled to its original dimensions and shall be allowed to relax for 1 minute prior to measurement to determine pass/fail.
8.4.6 Report.

8.4.6.1 Observations of ignition, melting, dripping, or separation shall be recorded and reported for each specimen.
8.4.6.2 The percent change in the width and length dimensions of each specimen shall be calculated. Results shall be reported as the average of all three specimens in each dimension.
8.4.7 Interpretation.
8.4.7.1 Any evidence of ignition, melting, dripping, or separation on any specimen shall constitute failing performance.
8.4.7.2 The average percent change in both dimensions shall be used to determine pass/fail performance. Failure in any one dimension constitutes failure for the entire sample.
8.4.8 Specific Requirements for Testing Protective Garments, and Protective Face/Neck Shroud Textiles.

8.4.8.1 Samples for conditioning shall be at least 1 m (1 yd) square of each material.
8.4.8.2 Each specimen shall be 380 mm x 380 mm, ±13 mm (15 in. x 15 in., ±1/2 in.) and shall be cut from the fabric to be utilized in the construction of the item.
8.4.8.3 Specimens shall be tested both before and after five cycles of washing and drying as specified in 8.1.2.
8.4.8.4 Testing shall be performed as specified in 8.4.2 through 8.4.7.
8.4.8.5 Any evidence of charring on any specimen of garment or face/neck shroud textiles shall also constitute failing performance in addition to the provisions of 8.4.7.1.
8.4.9 Specific Requirement for Testing Other Materials, Trim, and Label Materials of Protective Garments, and Protective Face/Neck Shroud.

8.4.9.1 Specimen length shall be 150 mm (6 in.), other than for textiles utilized in the clothing item in lengths less than 150 mm (6 in.), where length shall be the same as utilized in the clothing item.

8.4.9.2 Specimen width shall be 150 mm (6 in.), other than for textiles utilized in the clothing item in widths less than 150 mm (6 in.), where widths shall be the same as utilized in the clothing item.

8.4.9.3 Samples for conditioning shall include material sewn onto a one yard square ballast material no closer than 50 mm (2 in.) apart in parallel strips. The ballast material shall be as specified in AATCC 135, Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics. Specimens shall be removed from the ballast material prior to testing.
8.4.9.4 Testing shall be performed as described in 8.4.2 through 8.4.7.
8.4.9.5 Thermal shrinkage shall not be measured.
8.4.10 Specific Requirements for Testing Hardware.
8.4.10.1 A minimum of three complete hardware items shall be tested.
8.4.10.2 Observations of hardware condition following heat exposure shall be limited to ignition.
8.4.10.3 Hardware shall be evaluated for functionality within 10 minutes following removal from the oven.
8.4.10.4 The functionality of each hardware item shall be reported as pass or fail. Failure of any one item shall constitute failure for the entire sample.
8.4.10.5 Testing shall be performed as specified in 8.4.2 through 8.4.7. Thermal shrinkage shall not be measured.
8.4.11 Specific Testing Requirements for Protective Helmets.

8.4.11.1 A minimum of three helmets of each different style or model shall be tested.
8.4.11.2 Specimen helmets shall be securely mounted on a room-temperature nonmetallic headform in the "as worn" position.
8.4.11.3 A liner, ear flaps, or a similar device shall be deployed to protect the suspension, if necessary.
8.4.11.4 Specimens shall be conditioned as specified in 8.1.1.
8.4.11.5 A series of points shall be marked 75 mm (3 in.) apart on the outer edge of the peak or brim of the sample helmets, allowing at least three points on a peak and eight of more points on a full brim. The vertical distance from a known horizontal base plane to the mark points on the peak or brim shall be measured and recorded.
8.4.11.6 The test oven shall be horizontal flow circulating air oven with minimum internal dimensions of 460 mm x 460 mm x 460 mm (18 in. x 18 in. x 18 in.).
8.4.11.7 The oven shall be heated and stabilized to a temperature of 177°C, +6°/-0°C (350°F, +10°/-0°F) for a minimum of 30 minutes.
8.4.11.8 The sample helmet mounted on the headform shall be place in the center of the oven. If the sample helmet contains a peak only, the sample helmet shall face into the airflow.
8.4.11.9 After 5 minutes, +15/-0 seconds, oven exposure at 177°C, +6°/-0°C (350°F, +10°/-0°F), the sample helmet mounted on the headform shall be removed and allowed to cool for a minimum of 2 minutes.
8.4.11.10 The vertical distance from the marked points to the base plane shall be measured, recorded, and compared with the measurements recorded in 8.4.11.5 to determine pass/fail.
8.4.12 Specific Requirements for Testing Protective Gloves.

8.4.12.1 Specimens shall include complete gloves with labels.
8.4.12.2 Specimen gloves shall be preconditioned as specified in 8.1.1. Specimen gloves shall then be placed in a circulating air oven for not less than 4 hours at 49°C, +2°/-0°C (120°F, +5°/-0°F).
8.4.12.3 The glove body shall be filled with 4 mm perforated soda-lime glass beads, with care taken to tightly pack the glass beads into the fingers of the glove and glove body.
8.4.12.4 The opening of the glove shall be clamped together, and the specimen shall be suspended by the clamp in the oven so that the entire glove is not less than 50 mm (2 in.) from any oven surface or other specimen and air flow is parallel to the plane of the material.
8.4.12.5 The test oven shall be heated and the test thermocouple stabilized at 204°C, +6°/-0°C, (400°F, +10°/-0°F) for a minimum of 30 seconds.
8.4.12.6 After 5 minutes, +15/-0 seconds, oven exposure at 204C, +6°/-0°C (400°F, +10°/-0°F), the sample gloves shall be removed and allowed to cool for a minimum of 2 minutes.
8.4.12.7 The dimensions of the glove specimen shall also be measured to determine pass/fail.
8.4.12.7.1 Glove measurements shall be made following preconditioning and after the oven heat exposure specified in 8.4.12.5.
8.4.12.7.2 The length measurement of the glove specimen shall be from the tip of the middle finger to the end of the glove body on the palm side.
8.4.12.7.3 The width measurement of the glove specimen shall be the width measurement on the palm side 25 mm (1 in.) below the base of the fingers.
8.4.12.8 The percent change in the width and length dimensions of each specimen shall be calculated. Results shall be reported as the average of all three specimens in each dimension.
8.4.12.9 Testing shall be performed as described in 8.4.2 through 8.4.7.
8.4.13 Specific Testing Requirement for Protective Footwear.

8.4.13.1 Samples for conditioning shall be whole boots. Footwear specimens shall include sole, heel, and upper.
8.4.13.2 Conditioning shall be performed as specified in 8.1.1.
8.4.13.4 The footwear specimen shall be size 9.
8.4.13.5 Footwear specimens shall be filled with 4 mm perforated soda-line glass beads. Any closures shall be fastened.
8.4.13.6 The test thermocouple shall be positioned so that it is level with the horizontal centerline of a footwear test specimen. The thermocouple shall be equidistant between the vertical centerline of a footwear test specimen placed in the middle of the oven and the oven wall where the airflow enters the test chamber.
8.4.13.7 The minimum dimensions for the test oven specified in 8.4.4.1 shall be 610 mm x 610 mm x 610 mm (24 in. x 24 in. x 24 in.).
8.4.13.8 The protective footwear test specimen shall be placed in the center of the test oven with the centerline of the front of the specimen facing the airflow.
8.4.13.9 Following removal from the oven, the specimen shall be allowed to cool at room temperature for not less than 5 minutes, +15/-0 seconds.
8.4.13.10 Each tested specimen shall be reconditioned as specified in 8.1.1 and then re-examined inside and outside for separation and functionality of hardware on the footwear. The functionality of each part of the footwear shall be reported as pass or fail. Failure of any one part shall constitute failure for the entire sample.
8.4.13.11 Testing shall be performed as specified in 8.4.2 through 8.4.7. Thermal shrinkage shall not be measured.
8.4.14 Specific Testing Requirements for Load Carrying Protective Equipment.

8.4.14.1 A minimum of three complete load carrying equipment items shall be tested. The load carrying equipment items shall have all hardware secured that is used for the wearer to put on and take off the item in its normal wearing position.
8.4.14.2 Conditioning shall be performed as specified in 8.1.1.
8.4.14.3 The specimen shall be suspended at the top and centered in the oven so that the entire specimen is not less than 50 mm (2 in.) from any oven surface or other specimen, and air is parallel to the plane of the long axis of the load carrying equipment item.
8.4.14.4 The test oven shall be heated and the test thermocouple stabilized at 232°C, +6°/-0°C, (450°F, +10°/-0°F) for a minimum of 30 minutes.
8.4.14.5 Specimens shall be exposed for 5 minutes, +15/-0 seconds, to 232°C, +6°/-0°C (450°F, +10°/-0°F).
8.4.14.6 Immediately after the specified exposure, specimens shall be removed and examined for evidence of ignition, melting, dripping, or separation.
8.4.14.7 Within 30 seconds of removing specimens from the oven, the function of any hardware that is used for removal of the load carrying equipment item from the wearer's body shall be tested for complete release. Within 5 minutes of removing specimens from the oven, all hardware shall be tested for functionality.
8.4.14.8 The functionality of hardware shall be reported as pass or fail. Failure of any one hardware item shall constitute failure for the entire sample.
8.4.14.9 Testing shall be performed as specified in 8.4.2 through 8.4.7. Thermal shrinkage shall not be measured.
8.4.15 Specific Testing Requirements for Protective Goggles.

8.4.15.1 Three separate goggles per model shall be tested.

8.4.15.2 Conditioning shall be performed as specified in 8.1.1.
8.14.5.3 Each test shall be performed on a new cap style NFPA 1977 compliant helmet. The goggles shall be mounted above the brim of the helmet with the goggles to the front and the retention strap around the crown of the helmet. The helmet shall be securely mounted on a room-temperature nonmetallic headform in the "as worn" position.
8.14.5.4 The goggles mounted on the helmet and on the headform shall be placed in the center of the oven. The goggles shall face the airflow.
8.4.15.5 The test oven shall have minimum internal dimensions of 455 mm x 455 mm x 455 mm (18 in. x 18 in. x 18 in.).
8.4.15.6 The test oven shall be heated and the test thermocouple stabilized at 177°C, +6°/-0°C, (350°F, +10°/-0°F) for a minimum of 30 minutes.
8.4.15.7 Immediately after the ~~specified~~ oven exposure at 177°C, +6°/-0°C, (350°F, +10/-0°F) for 5 minutes, +15/-0 seconds, the goggles mounted on the helmet shall be removed from the oven and examined for melting, ignition, or dripping and their position of the helmet.
8.4.15.8 The specimens shall then be allowed to cool for a minimum of 5 minutes following removal from the oven and examined for separation of the lens from the frame. Any separation of the lens from the frame shall be reported as a failure and constitute failure for the sample
8.4.15.9 The cooled goggles and helmet shall then be placed on a CSA Adult or Alderson 50 percentile headform.
8.4.15.10 The goggles shall positioned on the headform in the as-worn position over the eyes. The retention strap of the goggles shall be tightened to secure the goggles to the headform per the adjustment instructions provided by the manufacturer. After an additional 5 minutes, the goggles shall be examined to determine if they remain in the original as-worn position over the eyes of the headform.
8.4.15.11 A test subject with 20/20 vision or vision corrected to 20/20 vision shall then don the helmet with goggle. The test subject shall place the goggles in the "as worn" position to test for optical distortion. In a room illuminated to 100 to 150 foot candles the technician shall read a standard eye chart at a distance of 6.1 m, with each eye through the center viewing area of the lens to determine optical clarity. The inability of the test subject to read the eye chart to a visual acuity level of 20/100 with each eye shall constitute failure of the sample.
8.4.15.12 Testing shall be performed as specified in 8.4.2 through 8.4.7. Thermal shrinkage shall not be measured.
8.4.15.13 For goggles, observations of ignition, melting, dripping or separation shall be recorded and reported for each specimen.
8.4.16 Specific Testing Requirements for Chain Saw Leg Protectors.

8.4.16.1 Each material and hardware item used in the construction of chain saw leg protectors shall be tested.
8.4.16.2 Conditioning shall be performed as specified in 8.1.1.
8.4.16.3 The test oven shall be heated and the test thermocouple stabilized at 232°C , +6°/-0°C, (450°F, +10°/-0°F) for a minimum of 30 minutes.
8.4.16.4 Immediately after the ~~specified~~ oven exposure at 232°C, +6°/-0°C, (450°F, +10°/-0°F) for 5 minutes, +15/-0 seconds, specimens shall be removed and examined for evidence of ignition, melting, dripping, or separation.
8.4.16.5 Within 5 minutes of removing specimens from the oven, all hardware shall be tested for functionality.
8.4.16.6 The functionality of hardware shall be reported as pass or fail. Failure of any one hardware item shall constitute failure for the entire sample.
8.4.16.7 Testing shall be performed as specified in 8.4.2 through 8.4.7. Thermal shrinkage shall not be measured.
Substantiation: The proposed changes are intended to provide clarification and consistency of testing requirements.
Committee Meeting Action: Accept

1977-114 Log #66 FAE-WFF **Final Action: Accept in Principle**
(8.4.1.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
This test method shall apply to garment ~~/~~, trim, label materials, and hardware; gloves; footwear; face/neck shroud textiles; load carrying equipment; goggles and goggle straps; and chain saw leg or foot protectors.
Substantiation: Editorial changes and the inclusion of foot protectors in the application portion of the test method.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-113 (Log #28) and foot protectors wee deleted by action taken on Comment 1977-3 (Log #161).

1977-115 Log #67 FAE-WFF **Final Action: Reject**
(8.4.1.9)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text as follows:
Modifications to this test method for testing chain saw leg or foot protectors shall be as specified in 8.4.16.
Substantiation: I believe the intent is to allow for leg or foot protectors in the Chain Saw Protector products.
Committee Meeting Action: Reject
Committee Statement: Chain saw foot protectors were deleted by action taken on Comment 1977-3 (Log #161).

1977-116 Log #68 FAE-WFF **Final Action: Accept**
(8.4.2.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text as follows:
Both heat and thermal shrinkage resistance testing shall be conducted on a minimum of three specimens for each garment and face/neck shroud textile, and whole gloves .
Substantiation: Additional items are required to have both heat and thermal shrinkage testing conducted. This language expands the current list to include those items.
Committee Meeting Action: Accept

1977-117 Log #69 FAE-WFF **Final Action: Reject**
(8.4.2.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-1
Recommendation: Add new text as follows:
Only heat resistance testing shall be conducted on a minimum of three specimens for each hardware item, helmet, footwear, load carrying equipment goggles, goggle straps, and chain saw leg or foot protectors.
Substantiation: I believe the intent is to allow for leg or foot protectors in the Chain Saw Protector products.
Committee Meeting Action: Reject
Committee Statement: Chain saw foot protectors were deleted by action taken on Comment 1977-3 (Log #161).

1977-118 Log #70 FAE-WFF **Final Action: Accept**
(8.4.9)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Specific Requirements for Testing Other Garment, and Protective Face/Neck Shroud Materials, Trim, and Label Materials of Protective Garments. ~~Cold Weather Protective Outerwear, and Protective Face/Neck Shroud.~~
Substantiation: Reformatting of title for clarity to put other fabric materials listed at the end of the title in a group with the garment materials.
Committee Meeting Action: Accept

1977-119 Log #11 FAE-WFF **Final Action: Hold**
(8.4.11.3)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
~~8.4.11.3 A liner, ear flaps, or a similar device shall be deployed to protect the suspension, if necessary.~~ (Delete paragraph 8.4.1.3; renumber subsequent paragraphs in 8.4.11)
Substantiation: Helmets are only tested for heat resistance at a temperature of 177°C (350°F). All materials exposed to oven temperatures should be able to sustain this temperature without adverse effects.
Committee Meeting Action: Hold
Committee Statement: The Committee should evaluate the performance of materials to heat exposures.

1977-120 Log #10 FAE-WFF **Final Action: Accept**
(8.4.11.10)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.4.11.10 The vertical distance from the marked points to the base plane shall be measured, recorded, compared with the measurements recorded in ~~8.4.11.3~~ 8.4.11.5 .
Substantiation: The wrong paragraph is referenced to determine pass/fail compliance.
Committee Meeting Action: Accept

1977-121 Log #71 FAE-WFF **Final Action: Accept**
(8.4.11.10)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:

The vertical distance from the marked points to the base plane shall be measured, recorded, and compared with the measurements recorded in ~~8.4.11.3~~ 8.4.11.5 to determine pass/fail.
Substantiation: Incorrect reference.
Committee Meeting Action: Accept

1977-122 Log #3 FAE-WFF **Final Action: Accept**
(8.4.12.7, 8.4.12.8)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Renumber paragraph 8.4.12.7 as 8.4.12.8; include new paragraph 8.4.12.7:
8.4.12.7 An assessment of the glove donnability and flexibility shall be made after the heat exposure by having a test subject whose hand dimensions are appropriate for wearing the glove put the glove on and attempt to ~~his or her~~ clutch the hands into a fist five times.
Substantiation: Criteria are provided for assessing glove donnability and flexing after heat exposure, but no procedures are provided.
Committee Meeting Action: Accept

1977-123 Log #181 FAE-WFF **Final Action: Accept in Principle**
(8.4.15.6, and 8.4.15.7)

Submitter: John Dondero, Eve Safety Systems Inc. (ESS)
Comment on Proposal No: 1977-2
Recommendation: 8.4.15.6 = ...at 177 C, ~~+6~~ (+5) -0...
8.4.15.7 = ~~immediately after the specified exposure, the~~ (After 5 minutes +15/-0 seconds, the sample) goggles mounted on the. . .
Substantiation: 8.4.15.6 = Change from +6C to +5C is consistent with other sections of the standard.
8.4.15.6 = The duration of the exposure is not specified and needs to be specified.
Committee Meeting Action: Accept in Principle
Committee Statement: See actions taken on Comment 1977-113 (Log #28).

1977-124 Log #180 FAE-WFF **Final Action: Accept in Principle**
(8.4.15.11)

Submitter: John Dondero, Eve Safety Systems Inc. (ESS)
Comment on Proposal No: 1977-2
Recommendation: Fourth line: ... through the center viewing of the lens (in front of each eye) to determine optical clarity. The inability of the test subject to read the eye chart (with either eye) to a visual acuity level...
Substantiation: This change ensures that the lenses provide minimal optical clarity in front of both eyes rather than in front of just one. This requirement is not difficult to achieve for lens/goggle manufacturers and helps provide quality eye protection to the wildland firefighter.
Committee Meeting Action: Accept in Principle
Committee Statement: See actions taken on Comment 1977-113 (Log #28).

1977-125 Log #107 FAE-WFF **Final Action: Reject**
(8.4.16)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add text to read as follows:
Specific Testing Requirements for Chain Saw Let <u>of Foot</u> Protectors.
Substantiation: I believe the intent is to allow for leg or foot protectors in the Chain Saw products.
Committee Meeting Action: Reject
Committee Statement: Chain saw foot protectors were deleted in action taken on Comment 1977-3 (Log #161).

1977-126 Log #106 FAE-WFF **Final Action: Reject**
(8.4.16.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add text to read as follows:
Each material and hardware item used in the construction of chain saw leg <u>or foot</u> protectors shall be tested.
Substantiation: I believe the intent is to allow for leg or foot protectors in the Chain Saw Protector products.
Committee Meeting Action: Reject
Committee Statement: Chain saw foot protectors were deleted by action taken on Comment 1977-3 (Log #161).

1977-127 Log #22 FAE-WFF **Final Action: Reject**
(8.5.3.1)

TCC Action: Change the action on Comment 1977-127 (Log 22) from "Accept" to "Reject".
The TCC reviewed the ROC negative ballot and comments regarding these three Comments and the THL performance requirement. The TC chairperson recognized that in handling separate comments an error had been made. It was not the intent of the TC to change the "breathability" performance from what is in the current edition and that it was the TC misunderstanding of the change in testing preconditioning that would have caused a less stringent performance for these garments. The TC chairperson informed the TCC that was not what the TC had believed would happen as the TC did not desire any change to the existing performance. The performance will remain as it is in current edition.
Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
8.5.3.1 Specimens to be tested shall be conditioned ~~for five wash/dry cycles~~ as specified in ~~8.1.2~~ 8.1.1 .
Substantiation: In NFPA 1971, 1999, 1951, this is performed after room conditioning only. Washing the sample 5 times increases the variability of the test as the specimen may not lie completely flat on the plate due to wrinkles occurring as a result of wash/dry conditioning.
Committee Meeting Action: Accept

1977-128 Log #41 FAE-WFF **Final Action: Reject**
(8.5.3.1)

TCC Action: Change the action on Comment 1977-128 (Log 41) from "Accept in Principle" to "Reject".
The TCC reviewed the ROC negative ballot and comments regarding these three Comments and the THL performance requirement. The TC chairperson recognized that in handling separate comments an error had been made. It was not the intent of the TC to change the "breathability" performance from what is in the current edition and that it was the TC misunderstanding of the change in testing preconditioning that would have caused a less stringent performance for these garments. The TC chairperson informed the TCC that was not what the TC had believed would happen as the TC did not desire any change to the existing performance. The performance will remain as it is in current edition.
Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.5.3.1 Specimens to be tested shall be conditioned for five wash/dry cycles as specified in ~~8.1.2~~ 8.1.1 .
Substantiation: A large amount of variability is introduced into the total heat loss test for fabrics following laundering. The room temperature conditioning used in other standards (NFPA 1971, NFPA 1951, and NFPA 1999) is appropriate for providing adequate material system discrimination for this test.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-129 (Log #140).

1977-129 Log #140 FAE-WFF **Final Action: Reject**
(8.5.3.1)

TCC Action: Change the action on Comment 1977-129 (Log 140) from "Accept" to "Reject".
The TCC reviewed the ROC negative ballot and comments regarding these three Comments and the THL performance requirement. The TC chairperson recognized that in handling separate comments an error had been made. It was not the intent of the TC to change the "breathability" performance from what is in the current edition and that it was the TC misunderstanding of the change in testing preconditioning that would have caused a less stringent performance for these garments. The TC chairperson informed the TCC that was not what the TC had believed would happen as the TC did not desire any change to the existing performance. The performance will remain as it is in current edition.
Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise to read as follows:
8.5.3.1 Specimens to be tested shall be conditioned ~~for five wash/dry cycles~~ as specified in ~~8.1.2~~ 8.1.1 .
Substantiation: A large amount of variability is introduced into the total heat loss test for fabrics following laundering. The room temperature conditioning used in other standards (NFPA 1971, NFPA 1951, and NFPA 1999) is appropriate for providing adequate material system discrimination for this test.
Committee Meeting Action: Accept

1977-130 Log #21 FAE-WFF **Final Action: Accept**
(8.5.3.2)

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Delete the following text:
~~8.5.3.2 Samples for conditioning shall be at least 1 m (1 yd) square of each material.~~
Substantiation: Not necessary for room temp conditioning only.
Committee Meeting Action: Accept

1977-131 Log #120 FAE-WFF **Final Action: Accept in Part**
(8.5.3.2)

Submitter: Holly Blake, WL Gore & Associates
Comment on Proposal No: 1977-2
Recommendation: Add text to read as follows:
8.5.3.2 After conditioning according to 8.5.3.1, samples shall be conditioned at a temperature of 25°C ± 7°C (77° F ± 12.6°F) and a relative humidity of 65 percent ± 5 percent for at least 4 hours.
8.5.3.3 old 8.5.3.2.
Substantiation: This allows the samples to be conditioned in the sweating hot plate chamber or under standard laboratory conditions. These conditions are specified by ASTM 1868 and the range has been widened to accommodate standard laboratory conditions. This will be a convenience for test labs without compromising results.
Committee Meeting Action: Accept in Part
Committee Statement: Accept new 8.5.3.2.
reject renumbering old 8.5.3.2 to 8.5.3.3 as old 8.5.3.2 was deleted by action on Comment 1977-130 (Log #21).

1977-132 Log #72 FAE-WFF **Final Action: Reject**
(8.6.1.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text as follows:
This test shall apply to protective garment, cold weather protective outerwear and face/neck shroud materials.
Substantiation: Addition of cold weather protective outerwear in application paragraph.
Committee Meeting Action: Reject
Committee Statement: Submitter was present at ROC and asked the Committee to not process this comment.

1977-133 Log #73 FAE-WFF **Final Action: Reject**
(8.7.1.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text as follows:
This test method shall apply to the protective garment, cold weather protective outerwear and protective face/neck shrouds.
Substantiation: Addition of cold weather protective outerwear in application paragraph.
Committee Meeting Action: Reject
Committee Statement: Submitter was present at ROC and asked the Committee to not process this comment.

1977-134 Log #74 FAE-WFF **Final Action: Accept**
(8.8.3.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Samples for conditioning shall be ~~1 M (1 yd) square of material~~ f ull clothing items or 305 mm (12 in.) or greater lengths of seam with at least 150 mm (6 in.) of material on either side of the seam centerline.
Substantiation: More appropriate language for the Sample Preparation of seams.
Committee Meeting Action: Accept

1977-135 Log #75 FAE-WFF **Final Action: Accept**
(8.8.3.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text as follows:
Specimens shall be conditioned as specified in 8.1.1.
Substantiation: Add new paragraph to indicate how the samples are to be preconditioned.
Committee Meeting Action: Accept

1977-136 Log #76 FAE-WFF **Final Action: Reject**
(8.8.4.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: At the end of the paragraph add the language:
The test machine shall be operated at a rate of 305 mm/min (12 in./min).
Substantiation: Indicates the speed at which the machine shall be operated. This was not included in this paragraph and will provide consistency in how the test is performed.
Committee Meeting Action: Reject
Committee Statement: This is covered in the ASTM test and the rate in note in the recommendation is not appropriate for knits.

1977-137 Log #105 FAE-WFF **Final Action: Accept**
(8.9.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add text to read as follows:
Application. This test method shall apply to each type of thread used in the construction of garments, helmets, gloves, footwear and face/neck shrouds.
Substantiation: The design requirements indicate that helmets are required to utilize heat resistant thread.
Committee Meeting Action: Accept

1977-138 Log #136 FAE-WFF **Final Action: Accept**
(8.9.4.1)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
The shall have... change to stage
Substantiation: Typo error.
Committee Meeting Action: Accept

1977-139 Log #104 FAE-WFF **Final Action: Accept**
(8.9.4.3(b))

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text to read as follows:
8.9.4.3b) *
A.8.7.4.3(b) Six standards for use in calibrating melting point apparatus can be obtained from the U.S. Pharmacopoeia Reference Standards, 46 Park Avenue, New York, NY 10016.
Substantiation: The annex language for this paragraph is not provided. This annex language suggested is the same as other NFPA standards.
Committee Meeting Action: Accept

1977-140 Log #78 FAE-WFF **Final Action: Accept**
(8.11.3.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Specimens shall be conditioned for each environmental condition specified in 8.1.1 and 8.1.4, and ~~8.1.5~~ prior to each impact.
Substantiation: Preconditioning Section 8.1.5 is redundant to 8.1.3.
Committee Meeting Action: Accept

1977-141 Log #79 FAE-WFF **Final Action: Accept**
(8.12.3.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Specimens shall be conditioned for each environmental condition specified in 8.1.1 and 8.1.4, prior to each impact.
Substantiation: Preconditioning Section 8.1.5 is redundant to 8.1.3.
Committee Meeting Action: Accept

1977-142 Log #8 FAE-WFF **Final Action: Reject**
(8.12.4.2)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: The penetration striker shall have a mass of 1 kg, +0.02/-0.00 kg (2.2 lb, +0.01/-0.00 lb). The point of the striker shall be a cone with an included angle of 60 degrees ± 1/2 degree, a height of 38 mm (1 1/2 in.), and a spherical tip radius of ~~0.5 mm~~ 0.25 mm , ±0.1 mm (0.020 in., ±0.004 in.). The hardness of the striking tip shall be Rockwell Scale C-60, minimum. The penetration striker shall be electrically connected to the contact indicator.
Substantiation: The proposed change would harmonize the striker with the same striker used in ANSI Z89.1. However, ANSI Z89.1 does not specify the hardness of the striking tip as in the proposed paragraph.
Committee Meeting Action: Reject
Committee Statement: The testing is now in accordance with ANSI Z89.1
See action taken on Comment 1977-35 (Log #124).

1977-143 Log #7 FAE-WFF **Final Action: Accept in Principle**
(8.13.1.1)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.13.1.1 This test method shall apply to protective helmets and antiglare material on helmets, where provided as permitted in ~~8.2.4~~ 6.2.7 .
Substantiation: The wrong paragraph is referenced.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-73 (Log #125).

1977-144 Log #80 FAE-WFF **Final Action: Accept in Principle**
(8.13.1.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
This test method shall apply to antiglare material on helmets, where provided as permitted in ~~8.2.4~~ 6.2.7 .
Substantiation: Incorrect reference.
Committee Meeting Action: Accept in Principle
Committee Statement: See actions taken on Comment 1977-73 (Log #125).

1977-145 Log #110 FAE-WFF **Final Action: Reject**
(8.13.4.1.4)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add the following text to the end of the existing paragraph.
The temperature of the flame at the tip of the inner cone shall be measured and shall be 1200°C ± 100°C (2192°F ± 180°F).
Substantiation: The text provides additional information for the specific requirements of the flame for this test. This will help to ensure consistent testing between laboratories conducting this test. Other NFPA committees are making these changes.
Committee Meeting Action: Reject
Committee Statement: Testing methods are now covered by ANSI Z89.1.
See action taken on Comment 1977-35 (Log #124).

1977-146 Log #111 FAE-WFF **Final Action: Reject**
(8.13.5.1.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text to read as follows:
The flame shall be applied to the test surface for 15 seconds, +1/-0 second. After removal of the flame, any afterflame shall be measured.
Substantiation: The duration of the test is not included in Procedure A. The language from Procedure B is suggested.
Committee Meeting Action: Reject
Committee Statement: The flame test is now provided by ANSI Z89.1.
See action taken on Comment 1977-35 (Log #124).

1977-147 Log #114 FAE-WFF **Final Action: Accept**
(8.15)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Replace with the entire section with the following:
8.15 Suspension System Retention Test.
8.15.1 Application. This test shall apply to protective helmets.
8.15.2 Specimens. Specimens shall be three helmets of each different style or model.
8.15.3 Sample Preparation.
8.15.3.1 Specimens shall be conditioned as specified in 8.1.1.
8.15.3.2 Samples for conditioning shall be whole helmets.
8.15.4 Apparatus.
8.15.4.1 The suspension system retention test fixtures shall consist of rigid material of sufficient thickness to facilitate firm attachment of the inverted helmet to the tensile test machine as shown in Figure 6.36.4.
8.15.4.2 The calibrated tensile test machine shall be capable of measuring the force applied to the retention system within 2 percent at the specified forces.
8.15.5 Procedure.
8.15.5.1 Each helmet suspension strap shall be cut such that sufficient length of strap remains to be gripped by the movable jaw of the testing machine.
8.15.5.2 Specimens shall be positioned and secured in the tensile testing machine so that the helmet's reference plane is horizontal.
8.15.5.3 Each attachment point of the crown strap shall be tested by applying a pull force along the centerline of the suspension strap, perpendicular to the reference plane to a maximum load of 22.5 N, +1/-0 N (5 lbf, +1/4/-0 lbf). the force shall be increased from 0N to 22.5N, ±5N (0 lbf to 5 lbf, ± 1/4 lbf) at a load rate of 25 mm/min, ± 3/16 in./min).
8.15.5.4 After application of the force is complete the load shall be released and the suspension system shall be inspected for any separation from the helmet shell.
8.15.5.5 Each adjusting mechanism of the helmet suspension system assembly shall be secured and unsecured, as applicable, for 20 repetitions.
8.15.6 Report.
8.15.6.1 The individual pass or fail results for each attachment point shall be recorded and reported.
8.15.6.2 Each adjusting mechanism of the helmet suspension system shall be observed for proper functioning to determine pass/fail.
8.15.7 Interpretation.
8.15.7.1 Separation of the helmet suspension from the helmet shall constitute failing performance.
8.15.7.2 One or more helmet specimens failing this test shall constitute failing performance.
Figure 8.15.4.1 - Delete top two items from figure.
Substantiation: The entire section was developed with the NFPA 1971 committee in order to provide a better test methodology to ensure consistency in testing. The reduced forces for testing of Wildlands helmets have been included.
Committee Meeting Action: Accept

1977-148 Log #126 FAE-WFF **Final Action: Accept**
(8.15.2.1, 8.17.2.1)

Submitter: Steven D. Corrado, Underwriters Laboratories Inc.
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
8.15.2.1 Specimens shall be ~~five~~ three helmets of each different style or model.
8.17.2.1 Specimens shall be ~~five~~ three helmets of each different style or model.
Substantiation: Three helmet specimens are required for these tests in NFPA 1971 and NFPA 1976. To maintain consistency with other Standards in the project, three specimens should be tested.
Committee Meeting Action: Accept

1977-149 Log #81 FAE-WFF **Final Action: Accept**
(8.16.1.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add text to read as follows:
This test method shall apply to all garment , load carrying devices, and helmet trim material.
Substantiation: There are performance requirements for trim on load carrying devices and helmets, therefore they should be included in the application section of this test method.
Committee Meeting Action: Accept

1977-150 Log #82 FAE-WFF **Final Action: Accept**
(8.16.2.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
"Each trim specimen shall consist of a 305 mm x 305 mm (12 in. x 12 in.) 100 mm x 100 mm (4 in. x 4 in.) composite made up of multiple strips…"
Substantiation: Smaller specimens can be utilized for this test method and not affect the test results. The smaller samples provide ease of handling during the testing. Other standards within this project have already moved to the smaller sample size successfully.
Committee Meeting Action: Accept

1977-151 Log #83 FAE-WFF **Final Action: Accept**
(8.16.3.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Specimens shall be conditioned as specified in ~~8.1.2~~ 8.1.1.
Substantiation: I believe this is an incorrect reference, trim samples should be conditioned for room temperature prior to testing, not laundering
Committee Meeting Action: Accept
Committee Statement: Correct 8.16.4.4.1 to reference 8.1.3 not 8.1.6.

1977-152 Log #112 FAE-WFF **Final Action: Accept**
(8.17)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Replace the entire section with the following:
8.17 Retention System.
8.17.1 Application. This test shall apply to protective helmets.
8.17.2 Specimens. Specimens shall be five helmets of each different style or model.
8.17.3 Sample Preparation.
8.17.3.1 Samples for conditioning shall be whole helmets.
8.17.3.2 Specimens shall be conditioned as specified in 8.1.1.
8.17.4 Apparatus.
8.17.4.1 An ISO size J headform shall be used.
8.17.4.2 A mechanical chin structure shall be designed for use with a calibrated tensile test machine. the mechanical chin structure shall consist of two rollers 13 mm (1/2 in.) in diameter with centers that are 75 mm (3 in.) apart. The mechanical chin structure shall conform to Figure 8.17.4.2.
8.17.4.3 The calibrated tensile test machine shall be capable of measuring the force applied to the retention system within 2 percent at the specified forces.
8.17.5 Procedure.
8.17.5.1 The test shall be conducted at an ambient temperature 20°C to 28°C (68°F to 82°F) and the relative humidity shall be 30 percent to 70 percent.
8.17.5.2 Prior to testing, the test machine shall be allowed to warm up until stability is achieved.
8.17.5.3 The headform and mechanical chin structure shall be positioned so that the vertical straight line distance between the bottom of the rollers and the crown of the headform is 200 mm, ± 10 mm (8 in. ±3/8 in.). The chin strap shall be passed around the rollers and the helmet shall be secured to the headform. The chin strap shall be adjusted and preloaded to 45 N, ± 5N (10 lbf ± 1 lbf). The distance between the top of the helmet and the bottom of the rollers shall be measured and recorded to the nearest 0.5 mm (1/64 in.).
8.17.5.5 The load rate shall be 25 mm/min (1 in./min) to a limit of 225 N (50 lbf).
8.17.5.6 The distance between the top of the helmet and the bottom of the rollers shall be measured and recorded again after the force has been maintained at 225N (50 lbf) for 60 seconds, +15/-0 seconds. The difference between the second measurement and the first shall be the retention system elongation.
8.17.5.7 In addition each adjusting mechanism of the helmet chin strap assembly shall be secured and unsecured, as applicable, for 20 repetitions.
8.17.6 Report.
8.17.6.1 The retention system elongation shall be measured and reported for each helmet specimen.
8.17.6.2 Each mechanism shall be observed for proper functioning to determine pass/fail.
8.17.7 Interpretation. One or more helmet specimens failing this test shall constitute failing performance.
Substantiation: The entire section was developed within the NFPA 1971 committee in order to provide a better test methodology to ensure consistency in testing. The reduced forces for testing of Wildlands helmets have been included.
Committee Meeting Action: Accept

1977-153 Log #5 FAE-WFF **Final Action: Reject**
(8.17.5.2 and 8.17.5.3)

Submitter: Thomas H. Stachler, Morning Pride Manufacturing/Total Fire Group
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.17.5.2 The force applied to the retention system shall be slowly increased to ~~225~~ 450 N, ±5 N (~~50~~ 100 lbf, ±1 lbf). The force shall be increased smoothly at a rate between 9.0 N/sec to 45 N/sec (2 lbf/sec to 10 lbf/sec)
8.17.5.3 Where using a tensile testing machine, the load rate shall be 25 mm/min (1 in./min) to a limit of ~~225~~ 450 N (~~50~~ 100 lbf).
Substantiation: The retention system of wildland fire fighting protective helmets should be tested to the same performance as helmets used in other fire fighting and emergency response applications.
Committee Meeting Action: Reject
Committee Statement: The submitter was present at the ROC meeting and requested that the Committee not process this comment.

1977-154 Log #84 FAE-WFF **Final Action: Accept**
(8.19.5.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
After 5 seconds +2/-0 seconds, with the weight still in place, the clip shall be inspected to determine if it has pulled away from the helmet or deformed more than 6 mm (1/4 in.) from its original position, either of which constitutes a failure.
Substantiation: Clarification of the test method. It is not specified if the measurement for pass/fail is made while the weight is in place or if it is removed.
Committee Meeting Action: Accept

1977-155 Log #85 FAE-WFF **Final Action: Accept**
(8.20.3.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Specimens shall be tested both before and after being subjected to five laundering cycles as ~~the procedure~~ specified in 8.1.2.
Substantiation: The number of cycles of laundering was not included.
Committee Meeting Action: Accept

1977-156 Log #86 FAE-WFF **Final Action: Accept**
(8.21.3.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Specimens shall be tested both before and after being subjected to five laundering cycles as ~~the procedure~~ specified in 8.1.2.
Substantiation: The number of cycles of laundering was not included.
Committee Meeting Action: Accept

1977-157 Log #87 FAE-WFF **Final Action: Accept**
(8.21.4.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
The time in seconds to pain and to second degree burn (blister) as predicted by the Stoll Human Tissue Burn Tolerance Criteria ~~as specified in 8.22.5.4~~ shall be recorded and reported.
Substantiation: Section 8.22.5.4 is no longer included in the standard because of the use of the ISO test method for TPP testing. However this information can be found in ASTM F1060 which is referenced for use in the next paragraph.
Committee Meeting Action: Accept

1977-158 Log #88 FAE-WFF **Final Action: Accept**
(8.22.2.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Sample for testing shall consist of the composite used in the actual glove construction, with the layers arranged in the proper order. Specimens shall not include seams where multiple layers are involved. Specimens shall not be stitched to hold individual layers together during testing .
Substantiation: 8.22.2.3 indicates that the samples should be stitched together for conditioning. Adding this language will limit confusion about when the sample or specimen can or cannot be stitched.
Committee Meeting Action: Accept

1977-159 Log #89 FAE-WFF **Final Action: Accept**
(8.22.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Sample Preparation. Specimens shall be tested after being subjected to five laundering cycles ~~preconditioning~~ as specified in 8.1.2 followed by conditioning as specified in 8.1.1.
Substantiation: The number of cycles of laundering was not included.
Committee Meeting Action: Accept

1977-160 Log #27 FAE-WFF **Final Action: Accept**
(8.22.5)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
a) An exposure heat flux of 84 kW/m ^{2} s (2.0 cal/cm ^{2} s) shall be used.
Substantiation: Wrong units.
Committee Meeting Action: Accept

1977-161 Log #113 FAE-WFF **Final Action: Accept**
(8.22.5(d))

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text to read as follows:

T-150 Quartz tubes shall be used.
Substantiation: Currently there is a proposed errata for ISO 17492 but I am not aware of its issuance at this time. therefore we should make the clarification in this standard until the errata is issued.
Committee Meeting Action: Accept

1977-162 Log #90 FAE-WFF **Final Action: Accept**
(8.23.5.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
The ~~cut~~ distance of blade travel shall be reported to the nearest 1 mm (0.05 in.) for each sample specimen. The average ~~cut~~ distance of blade travel in mm (in.) shall be reported for all specimens tested.
Substantiation: Modification is to change to proper terminology for this test methodology.
Committee Meeting Action: Accept

1977-163 Log #91 FAE-WFF **Final Action: Accept**
(8.24.1.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Modifications to this test method for testing ~~footwear uppers~~ protective gloves shall be specified in 8.24.7 ~~and 8.24.8.~~
Substantiation: The information struck in this paragraph is contained in 8.24.1.3.
Committee Meeting Action: Accept

1977-164 Log #25 FAE-WFF **Final Action: Accept**
(8.25)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise Test Method 8.25 as follows:
8.25 Dexterity Test.
8.25.1 Application. This test shall apply to gloves.
8.25.2 Specimens.
8.25.2.1 A minimum of three gloves pairs each for small and large sizes shall be used for testing.
8.25.2.2 Each glove pair shall be tested as a complete set of gloves in new, as distributed, condition.
8.25.2.3 Glove pair specimens shall not receive special softening treatments prior to tests.
8.25.3 Sample Preparation.
8.25.3.1 Glove pair specimens shall be preconditioned as specified in 8.1.2.
8.25.3.2 Samples for conditioning shall be whole glove pairs.
8.25.4 Apparatus. The test apparatus shall be as specified in ASTM F 2010, Standard Test Method for Evaluation of Glove Effects on Wearer Hand Dexterity Using a Modified Pegboard Test.
8.25..5 Procedures. Testing shall be conducted in accordance with ASTM F 2010, Standard Test Method for Evaluation of Glove Effects on Wearer Hand Dexterity Using a Modified Pegboard Test.
8.25.6 Report. The average percent of barehanded control shall be reported for each test subject. The average percent of barehanded control for all test subjects shall be calculated.
8.25.7 Interpretation. The average percent of barehand control shall be used to determine pass/fail performance.
Substantiation: An ASTM test method can be cited for the test procedures.
Committee Meeting Action: Accept

1977-165 Log #92 FAE-WFF **Final Action: Accept**
(8.25.3.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Glove pair specimens shall be preconditioned for five laundering cycles as specified in 8.1.2.
Substantiation: The number of cycles of laundering was not included.
Committee Meeting Action: Accept

1977-166 Log #95 FAE-WFF **Final Action: Accept**
(8.25.5.3, 8.26.4.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Test subjects shall be selected ~~so~~ such that their hand dimensions are as close as possible to t ~~he middle of the range for hand length and hand circumference as specified in the tales provided for size small and size large gloves in 6.3.4.2~~ those specified in Table 6.3.4.4.
Substantiation: Consistency in whole glove testing where sizing to a person is involved. Language is already used in 8.25.5.3 (dexterity text).
Committee Meeting Action: Accept

1977-167 Log #93 FAE-WFF **Final Action: Accept**
(8.25.5.8)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
"Each test subject shall perform the test following the steps in ~~8.20.5.5~~ 8.25.5.5 through ~~8.20.5.7~~ 8.25.5.7 until variance of the dexterity times of that person's last three…"
Correct numbering: Paragraph 8.20.4 should read 8.25.4.
Paragraph 8.20.5.9 should read 8.25.5.9.
Substantiation: Correction of references.
Committee Meeting Action: Accept

1977-168 Log #94 FAE-WFF **Final Action: Accept**
(8.25.5.9)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Each test subject shall then perform the test with one pair of gloves following the steps in ~~8.20.5.5~~ 8.25.5.5 through ~~8.20.5.7~~ 8.25.5.7 with the pair of test gloves until the variance of the dexterity times of that person's fastest three repetitions does not exceed 8 percent. Variance shall be calculated as in ~~8.20.5.8~~ 8.25.5.8 .
Substantiation: Correction of references.
Committee Meeting Action: Accept

1977-169 Log #103 FAE-WFF **Final Action: Accept**
(8.26.2.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add text to read as follows:
Specimen glove pairs shall be preconditioned for five laundering cycles as specified in 8.1.2.
Substantiation: The number of cycles of laundering was not included.
Committee Meeting Action: Accept

1977-170 Log #137 FAE-WFF **Final Action: Accept in Principle in Part**
(8.30.2)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: New wording:
8.30.3 Number of Specimens required for testing chain saw leg protectors shall be as indicated in F1414 and specimens for chain saw foot protection as indicated in F1458 .
Substantiation: The requirement as indicated in the current wording is lower than the quantity of specimens required by F1414 and F1458.
Committee Meeting Action: Accept in Principle in Part
Revise 8.30.2 to read:
The number of specimens for testing shall be as specified in ASTM F1414
Committee Statement: The Committee agrees and modified the text for leg protectors only.
The Committee rejected the text for foot protectors as they were deleted in action taken on Comment 1977- (Log #161).

1977-171 Log #138 FAE-WFF **Final Action: Accept**
(8.30.4.1)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: Revise to read:
The chain saw leg protection shall be tested in accordance with ASTM F1414...
~~8.30.4.2~~ Change number sequence
8.30.4.1.1 The test shall be conducted at a chain speed 50 (CS50) 15.25 m/sec (3000 fpm) when tested at both 45 degrees ...
Substantiation: The F1897 specification states that the pass/fail requirement for chain speed 50 (CS50) is 15.25 m/sec (3000 fpm).
Committee Meeting Action: Accept

1977-172 Log #139 FAE-WFF **Final Action: Reject**
(8.30.4.2)

Submitter: Vincent Diaz, Atlantic Thread & Supply Company
Comment on Proposal No: 1977-2
Recommendation: 8.30.4.2 - Delete current wording and change to read:
8.30.4.2 The chain saw foot protection shall be tested in accordance with

F1458, Standard Test Method for Measurement of Cut Resistance to Chain saw of Foot Protective Devices.

8.30.4.2.1 The test shall be conducted at a chain speed 50 (CS50) of 15.25 m/sec (3000 fpm) when tested at all cut positions.

Substantiation: The F1818 specification states that the pass/fail requirement for chain speed 50 (CS50) is 15.25 m/sec (3000 fpm).
Committee Meeting Action: Reject
Committee Statement: Chain saw foot protectors were deleted in action taken on Comment 1977-3 (Log #161).

1977-173 Log #96 FAE-WFF **Final Action: Accept**
(8.30.5)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
Failure of any single test specimen shall constitute failing performance.
Substantiation: Consistency in text.
Committee Meeting Action: Accept

1977-174 Log #24 FAE-WFF **Final Action: Accept in Part**
(8.32, 8.35, and 8.36)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Delete test methods.
Substantiation: Test procedures for these tests are already addressed in Section 8.4.
Committee Meeting Action: Accept in Part
Accept deletion of Sections 8.35 adn 8.36.
Reject deletion of Section 8.32
Committee Statement: Section 8.32 addresses label durability which is not addressed in Section 8.4.

1977-175 Log #97 FAE-WFF **Final Action: Accept**
(8.32.4.3.1(1))

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
The oven pre-heat specified in ~~8.4.4.4~~ 8.4.4.6 shall be stabilized at 141°C, +6/-0°C.
Substantiation: Incorrect reference.
Committee Meeting Action: Accept

1977-176 Log #98 FAE-WFF **Final Action: Accept**
(8.32.7.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
"For testing label legibility after laundering, specimens shall be individual labels ~~sewn~~ attached onto a 1 m (1 yd) square of ballast material no closer..."
Substantiation: Not all labels are sewn in, therefore the requirement should simply be to attach the label to the ballast material.
Committee Meeting Action: Accept

1977-177 Log #99 FAE-WFF **Final Action: Accept**
(8.32.7.3)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
"For testing label after convective heat exposure, specimens shall be individual labels ~~sewn~~ attached onto a separate 380 mm (15 in.) square of material…"
Substantiation: Not all labels are sewn in, therefore the requirement should simply be to attach the label to the ballast material.
Committee Meeting Action: Accept

1977-178 Log #100 FAE-WFF **Final Action: Accept**
(8.33.3.2)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Revise text to read as follows:
"Specimens shall be conditioned as specified in 8.1.1, ¨and 8.1.4 ~~and 8.1.5~~ . The radiant heat conditioning..."
Substantiation: Pre-conditioning Section 8.1.5 is redundant to 8.1.3.
Committee Meeting Action: Accept

1977-179 Log #42 FAE-WFF **Final Action: Accept**
(8.34.4.1)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Comment on Proposal No: 1977-1
Recommendation: Revise text to read as follows:
8.34.4.1 The test apparatus shall consists of a burner, crucible tongs, support stand, utility clamp, stopwatch, butane gas, gas regulator valve system, and measuring scale.
(a) The burner shall be a high temperature, liquefied type Fisher burner.
(b) The stopwatch or other timing device shall measure the burning time to the nearest 0.1 s.
(c) The butane shall be of commercial grade, 99.0 percent pure or better.
(d) The gas regulator system shall consist of a control valve system with a delivery rate designed to furnish gas to the burner under a pressure of 17.3 kPa ± 1.7 kPa (2.5 psi ±0.25 psi) at the reducing valve. The flame height shall be adjusted at the reducing valve producing a pressure of 0.7 kPa, ±0.07 kPa (0.1 psi, ±0.01 psi).
Substantiation: The proposed changes removes the reference to FTMS 191A, 5905.1.
Committee Meeting Action: Accept

1977-180 Log #115 FAE-WFF **Final Action: Accept in Principle**
(8.34.4.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Replace paragraph with language in 8.20.4.1 of this ROP.
Substantiation: FED-STD-191A is no longer being maintained. The changes required to incorporate the language from the Federal Standard have been made for the glove flame test in this ROP but not the footwear.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-179 (Log #42).

1977-181 Log #179 FAE-WFF **Final Action: Accept in Principle**
(8.35.3.1)

Submitter: John Dondero, Eve Safety Systems Inc. (ESS)
Comment on Proposal No: 1977-2
Recommendation: 8.35 = correct spelling "protective".
8.35.3.1 Goggles shall be examined for compliance to sections ~~7.8.1.1~~ (7.6.1) and ~~7.8.1.2~~ (7.6.2)
Substantiation: The incorrect section is referenced.
Committee Meeting Action: Accept in Principle
Section 8.35 has been deleted in action taken on Comment 1977-174 (Log #24).
Committee Statement: Text covering the submitters can now be found in action taken on Comment 1977-113 (Log #28).

1977-182 Log #178 FAE-WFF **Final Action: Accept in Principle**
(8.37)

Submitter: John Dondero, Eve Safety Systems Inc. (ESS)
Comment on Proposal No: 1977-2
Recommendation: (After testing as specified in Section 8.35, Protective Goggle Heat Resistance test, and allowed to cool as specified in Section 8.35.2.3) a test subject with 20/20 vision or vision... the test subject shall read the standard eye chart at a distance of 6.1 m through the center viewing area of the lens (in front of each eye) to determine optical clarity.
Substantiation: It is not clear that the heat test is performed prior to the Optical test. Adding specific language clarifies this.
Also, clear vision should be required through both eyes and thus the requirement to test in front of each eye.
Committee Meeting Action: Accept in Principle
Section 8.37 was deleted in action taken on Comment 1977-91 (Log #59).
Committee Statement: The modified text can now be found in action taken on Comment 1977- 113 (Log #28).

1977-183 Log #177 FAE-WFF **Final Action: Accept**
(8.37.2.1)

Submitter: John Dondero, Eve Safety Systems Inc. (ESS)
Comment on Proposal No: 1977-2
Recommendation: The pass/fail of each goggle shall be recorded and reported.
Substantiation: Editorial.
Committee Meeting Action: Accept

1977-184 Log #199 FAE-WFF **Final Action: Accept**
(A.1.1.3)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
A.1.1.3
~~Both NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, and OSHA require that eye protection meet the requirements of ANSI Z87.1, Practice for Occupational and Educational Eye and Face Protection. Safety Glasses, because they are worn against the skin, will probably not see heat loading beyond their ability to withstand. "Since goggles are often worn on top of the helmet, they should be chosen for increased heat resistance."~~
~~Protective eyewear should be selected based on its compatibility with the helmet being worn. Antiscratch and antifog coatings are recommended. Tinted eyewear is available and might be useful. The authority having jurisdiction should take into account the expected usage environment, the anticipated eye and fact hazard exposures, and the options available.~~
Substantiation: The Technical Committee has proposed that eye protection (goggles) be included into the body of the standard, therefore any reference to choices for "heat resistance" and compatibility to interfacing with the wildland fire fighting helmet are now requirements and do not belong in the body of the ANNEX.
Similarly, any reference to safety glasses, would be considered "Accessory". The Technical Correlation Committee (TCC) has informed NFPA 1977 TC that references to accessories shall have a standardized statement. Consequently, the paragraph needs to be removed.
Committee Meeting Action: Accept

1977-185 Log #116 FAE-WFF **Final Action: Accept**
(A.4.6.1, A.4.6.2, A.4.6.11 and A.4.6.13)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: A.4.6.1 insert language from NFPA 1975, 2004 Ed A.4.5.1.
A.4.6.2 insert language from NFPA 1975, 2004 Ed A.4.5.2.
A.4.6.11 insert language from NFPA 1975, 2004 Ed A.4.5.11.
A.4.6.13 insert language from NFPA 1975, 2004 Ed A.4.5.13.
Substantiation: Each of these paragraphs have explanatory materials. The explanatory materials were not included with this ROP. The language from NFPA 1975, 2004 Edition contains the most recent revision of this material and should be included in this document as well.
Committee Meeting Action: Accept

1977-186 Log #191 FAE-WFF **Final Action: Accept**
(A.6.1)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
Delete all of A.6 and A.7.
Substantiation: All this annex material would be better served in the future scam document.
Committee Meeting Action: Accept

1977-187 Log #196 FAE-WFF **Final Action: Accept in Principle**
(A.6.1.4)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
A.6.1.4
~~Cover flaps are required on patch pockets in order to prevent flying embers from lodging in pocket cavities. Upper torso inserted pockets require closure systems in order to prevent flying embers from lodging in pocket cavities.~~
Substantiation: This ANNEX uses wording that is inconsistent with the scope of ANNEX; that is the sentences are providing requirement language, where it needs to provide recommends. Additionally, 6.1.4 requires that "all pockets that open to the exterior of garments, other than front waist pockets, shall have a cover or closure system."
Consequently this ANNEX component needs to be removed.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-186 (Log #191).

1977-188 Log #197 FAE-WFF **Final Action: Accept in Principle**
(A.6.1.5)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
A.6.1.5
~~Pass through openings of one piece garments require closure systems in order to prevent flying embers from lodging in pockets cavities.~~
Substantiation: This ANNEX uses wording that is inconsistent with the scope of ANNEX; that is the sentence is providing requirement language, where it needs to provide recommends. Additionally, 6.1.5 requires that "Any pass-through openings in garments shall have a means of fastening them in a closed position." While not specifically addressing the one-piece garments, it addresses ALL garments.
Consequently this ANNEX component needs to be removed.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-186 (Log #191).

1977-189 Log #192 FAE-WFF **Final Action: Accept in Principle**
(A.6.1.15)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: A.6.1.15 (renumbered during the NFPA 1977 TC in Phoenix to A.6.1.17)
The USFS and cooperating federal and state agencies have been active developing wildland fire fighting protective clothing and equipment for over 30 years. This includes designing protective clothing and equipment, supporting procurement activities, and monitoring field use of products. Designing includes choosing the best components and patterns to maximize protection, comfort, and durability at a reasonable cost. Procurement support includes developing specifications and drawing and performing first article and subsequent quality assurance inspections. Monitoring field use includes performance trials prior to adoption, redesigning based on user feedback after adoption, and retrieving clothing form entrapment fires. Analysis of entrapment victim clothing and protective equipment proceeds sequentially from equipment and primary protective clothing to undergarments, underwear, and finally to victim burn are and severity. ~~This extensive experience has shown that loose fitting clothing is more important than the fire resistance of materials in preventing serious burn injury.~~ Clothing that is tight fitting poses a danger to the wildland fire fighter from radiant heat and heat stress, while, at the same time, diminishing the fire fitghter's ability to perform. This standard includes a basic measurement system, which ensures that a properly sized garment will provide adequate room or ease for the wearer's shoulders, chest, sleeves, seat, thighs, knees, and calves. USDA Forest Service wildland fire fighting experience indicates that wearing an oversized protective garment of the same nominal size as normal streetwear is the only way to ensure the comfort that is a critical safety feature of these garments.
Substantiation: Addition of fighting is consistent with the definitions and wording throughout the document.
References to indicate that nonquantifiable components (loose-fitting clothing) are more important than the standard is not in the spirit of the Technical Committee's work, nor can it be verified. This sentence is not appropriate for this document, including the ANNEX.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-186 (Log #191).

1977-190 Log #190 FAE-WFF **Final Action: Accept in Principle**
(A.6.7.8)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
Personal Hydation Systems. ~~This accessory~~ Personal hydration systems can be considered one of ~~to~~ the most vital for the wildland fire fighter. The need to rehydrate the body can be a critical factor in reducing the change of heat related illnesses; heat cramps, heat exhaustion ~~stress~~ or heat stroke. Currently, a wildland fire fighter has two optional ways to transport fluids: (1) the conventional 32 oz canteen, which fits into a carrier attached to the web belt, and (2) a two or three liter "hands free" personal hydration system, which uses a hose that allows the wearer to turn their head, engage the water outlet and draw water.
Substantiation: Minor language changes to remove reference to the word Accessory; grammar cleaning, and a more consistent application of Heat Stress to include the three primary heat-related illness conditions.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-186 (Log #191).

1977-191 Log #194 FAE-WFF **Final Action: Accept in Principle**
(A.6.8.4)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
~~All hardware, brackets, and snaps or other fasteners of any accessories shall be free of rough spots, burrs, or sharp edges.~~
Substantiation: This section references ACCESSORIES which the Technical Correlation Committee (TCC) has provided standardized language. This sentence is no longer needed.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-186 (Log #191).

1977-192 Log #193 FAE-WFF **Final Action: Accept in Principle**
(A.7.1)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
~~A.7.1 Extensive wear testing has shown that wildland fire fighters prefer a garment combination that results in fabric weights of 5.5 oz/yd2. Suggested lower torso fabric weight in 8 oz/yd2, while suggested jacket or shirt weights are in the range of 5.5 oz/yd2 to 6.5 oz/yd2. Knit T-shirt fabrics, in the 3 oz/yd2 to 4 oz/yd2 range, when worn in conjunction with the jacket or shirt weight fabrics, produce a combined weight in the preferred 8 oz/yd2 to 12 oz/yd2 range. Lighter combinations result in increased radiant heat stress and more punctures, tears, and abrasion. Heavier combinations impeded body movement and cooling.~~
~~Specifiers and purchasers of wildland fire fighting protective garments might want to request a mannequin test on the garments prior to purchasing them.~~
Substantiation: There is no reference document in Chapter 2 REFERENCED PUBLICATIONS to substantiate the information in A.7.1. If it is permissible to include references for ANNEX material, then it would be appropriate to include comments on fabric weights, weave-styles, and two-layering.
The statement about lighter combinations result in more punctures, tears and abrasion are misleading Lighter-weight is not the sole factor on whether or not a fabric will tear or puncture more readily than a heavier-weight fabric. Weave also plays an important role. Indicating that multi-layers are 'less resistant to tears, punctures, and abrasion" than a single layer is not factual.
The mention of THERMAL MANNEQUIN Testing in the ANNEX does not provide the reader any information as to its benefit. Is it for tear resistance, puncture resistance, abrasion resistance, heat stress values, cooling factor, or body movement. the sentence is misleading since this is correlated to the whole Protective Garment Performance Requirements section with Chapter 7.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-186 (Log #191).

1977-193 Log #117 FAE-WFF **Final Action: Accept in Principle**
(Table A.7.1.7)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: There are formatting problems with this table, revert to the table in the 1998 Edition for publication.
Substantiation: There are symbols and dashes missing in this table. Without them the information changes dramatically and is inaccurate.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on Comment 1977-186 (Log #191).

1977-194 Log #77 FAE-WFF **Final Action: Accept**
(A.8.9.4.1)

Submitter: Karen E. Lehtonen, Lion Apparel
Comment on Proposal No: 1977-2
Recommendation: Add new text as follows:
A.8.9.4.1 Apparatus of the type described in this method may be obtained from:
(1) The Fisher Scientific Company, 711 Forbes Avenue, Pittsburgh, PA 15219, and is known as the Fisher-Johns Melting Point Apparatus.
(2) Thomas Scientific, PO Box 99, Swedesboro, NJ 08085.
Substantiation: The annex language for this paragraph is not provided. This suggested annex language is the same as other NFPA standards.
Committee Meeting Action: Accept

1977-195 Log #201 FAE-WFF **Final Action: Accept**
(A.8.22)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Delete A.8.22
Substantiation: Discussions at the NFPA 1977 TC meeting in Phoenx, Arizona, on March 8th and 9th stated that all testing standards are based on the ISO 9000 certification series (sic). Why there is a reference that a test method is not recommended on components that are not specific to 8.22 (GLOVES) is redundant, and confusing. If there is a test method for wildland fire fighting gloves, then the reader needs to refer to the TESTING METHODS CHAPTER within NFPA 1977.
In reading the section 8.22 I see no asterisk in the body of the standard; another reason to remove the annex section.
Committee Meeting Action: Accept

1977-196 Log #200 FAE-WFF **Final Action: Accept in Principle**
(A.8.22.5.3.8)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Revise as follows:
A.8.22.5.3.8
~~A..22.5.3.8 Calibration procedures of the copper calorimeter are based on the following equation:~~
~~I = 41.84 (MC/KAe)(dT/dt)~~
~~Where:~~
~~I - incident heat influx (kW/m^{-2})~~
~~41.84 = conversion factor to KW/m^{-2} from the cal/cm^{-2} see~~
~~dT/dt = rate of temperature rise for the calorimeter indicated by mV/°C~~
~~MC/Ka$_e$ = calorimeter's physical constant, which includes the variables A, e and M~~
~~M is the finished mass (g) of the calorimeter, which includes the copper disk and flat black paint mass on the sensing surface minus the thermocouple mass. C is the heat capacity of pure copper, which is 0.0927 c al/g°C. K is the thermocouple conversion constant (0.053 mV/°C) for the Type J , iron constant thermocouple at an average test temperature of 65°C (150°F). A is the surface area (12.49 cm^{-2}) for the calorimeter's front surface, which is exposed to the test heat flux. - is the emissivity or absorptivity of the black paint used on the calorimeter's front surface, usually a value not less than 0.95. The physical constant used in calibration calculations with these sensors is sensitive to changes in mass and/or emissivity values.~~
~~For the copper disk calorimeter used in the TPP test, the punched out and drilled coper slug mass must be between 17.5 g and 18.0 g to meet the temperature rise ov er the 10 second rate requirement.~~
~~The calorimeter's physical constant can be calculated based on the above discussion. Check the repaired calorimeter's performance by substituting it with the calibration calorimeter. After proving equivalence, the test calorimeter can be placed back into service.~~
~~Copper Calorimeter Repair Procedures. The copper disk can be removed from its support board and checked to ensure that all thermocouple to disk connections are securely made. Any loose connections should be repaired. To repair loose connections, the thermocouple data transfer wire should be removed, while leaving the short thermocouple wires exnteding from a quality flat black paint of know emissivity, with a value of no less than 0.95, It may take two or three light coats to completely and evenly cover the surface. After the paint has thoroughly dried, the finished calorimeter should be carefully weighed, and its total mass recorded to an accuracy of 0.01 g. The total mass should include the copper disk mass with the short thermocouple wires attached, and also includes the mass of flat black paint applied to the sensor's thermocouple wire mass from the sensor's total mass. This is accomplished by measuring the sensor's thermocouple wire lengths from their ends down to the calorimeter's back surface. Then the total wire mass should be calculated based on the number of wires and ver lengths. This value should then be subtracted from the total mass of the calorimeter assembly to obtain the finished mass. After the finished mass is determined, the data transfer wires should be securely reconnected, and the sensor repositioned in its support board.~~
Substantiation: There is no correlating asterisk to this ANNEX in the ROP for the NFPA 1977 2005 edition. With the use of the ISO certification requirements, and the need for consistency in testing, this ANNEX needs to be removed. Testers and certifiers have all the necessary education, equipment, and testing methodologies. Individuals wishing to conduct independent testing need to follow established testing methods, and not some "shoulds" as described in this ANNEX.
Committee Meeting Action: Accept in Principle
Committee Statement: See action taken on 1977-195 (Log #201).

1977-197 Log #198 FAE-WFF **Final Action: Accept**
(A.8.30.3.7)

Submitter: Galen McCray, California Department of Forestry and Fire Protection
Comment on Proposal No: 1977-2
Recommendation: Delete A.8.30.3.7.
Substantiation: In the 1998 edition of NFPA 1977 there was a section on Glove Fit Test (6.30). I see no corresponding section in the 1977 ROP for the 2005 edition. I believe the testing methods have been changed and this section is no longer applicable. If there is applicability, then the ANNEX numbering needs to be changed.
Committee Meeting Action: Accept