

NFPA®

1855

**Standard on Selection,
Care, and Maintenance of
Protective Ensembles for
Technical Rescue Incidents**

2018



IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA STANDARDS

NFPA® codes, standards, recommended practices, and guides (“NFPA Standards”), of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in NFPA Standards.

The NFPA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on NFPA Standards. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making NFPA Standards available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of NFPA Standards. Nor does the NFPA list, certify, test, or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.

REVISION SYMBOLS IDENTIFYING CHANGES FROM THE PREVIOUS EDITION

Text revisions are shaded. A **Δ** before a section number indicates that words within that section were deleted and a **Δ** to the left of a table or figure number indicates a revision to an existing table or figure. When a chapter was heavily revised, the entire chapter is marked throughout with the **Δ** symbol. Where one or more sections were deleted, a **•** is placed between the remaining sections. Chapters, annexes, sections, figures, and tables that are new are indicated with an **N**.

Note that these indicators are a guide. Rearrangement of sections may not be captured in the markup, but users can view complete revision details in the First and Second Draft Reports located in the archived revision information section of each code at www.nfpa.org/docinfo. Any subsequent changes from the NFPA Technical Meeting, Tentative Interim Amendments, and Errata are also located there.

REMINDER: UPDATING OF NFPA STANDARDS

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that NFPA Standards may be amended from time to time through the issuance of a Tentative Interim Amendment (TIA) or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any TIAs and Errata then in effect.

To determine whether an NFPA Standard has been amended through the issuance of Tentative Interim Amendments or corrected by Errata, go to www.nfpa.org/docinfo to choose from the list of NFPA Standards or use the search feature to select the NFPA Standard number (e.g., NFPA 13). The document information page provides up-to-date document-specific information as well as postings of all existing TIAs and Errata. It also includes the option to register for an “Alert” feature to receive an automatic email notification when new updates and other information are posted regarding the document.

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of NFPA Standards

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the NFPA at the address listed below.

Interpretations of NFPA Standards

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing the Development of NFPA Standards shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

Patents

The NFPA does not take any position with respect to the validity of any patent rights referenced in, related to, or asserted in connection with an NFPA Standard. The users of NFPA Standards bear the sole responsibility for determining the validity of any such patent rights, as well as the risk of infringement of such rights, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on NFPA Standards.

NFPA adheres to the policy of the American National Standards Institute (ANSI) regarding the inclusion of patents in American National Standards (“the ANSI Patent Policy”), and hereby gives the following notice pursuant to that policy:

NOTICE: The user’s attention is called to the possibility that compliance with an NFPA Standard may require use of an invention covered by patent rights. NFPA takes no position as to the validity of any such patent rights or as to whether such patent rights constitute or include essential patent claims under the ANSI Patent Policy. If, in connection with the ANSI Patent Policy, a patent holder has filed a statement of willingness to grant licenses under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, copies of such filed statements can be obtained, on request, from NFPA. For further information, contact the NFPA at the address listed below.

Law and Regulations

Users of NFPA Standards should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of its codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

NFPA Standards are copyrighted. They are made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making these documents available for use and adoption by public authorities and private users, the NFPA does not waive any rights in copyright to these documents.

Use of NFPA Standards for regulatory purposes should be accomplished through adoption by reference. The term “adoption by reference” means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of NFPA Standards, contact NFPA at the address below.

For Further Information

All questions or other communications relating to NFPA Standards and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA standards during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101; email: stds_admin@nfpa.org.

For more information about NFPA, visit the NFPA website at www.nfpa.org. All NFPA codes and standards can be viewed at no cost at www.nfpa.org/docinfo.

Copyright © 2017 National Fire Protection Association®. All Rights Reserved.

NFPA® 1855

Standard on

Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents

2018 Edition

This edition of NFPA 1855, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents*, was prepared by the Technical Committee on Special Operations Protective Clothing and Equipment and released by the Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment. It was issued by the Standards Council on November 10, 2017, with an effective date of November 30, 2017, and supersedes all previous editions.

This edition of NFPA 1855 was approved as an American National Standard on November 30, 2017.

Origin and Development of NFPA 1855

In March 2009, the NFPA Standards Council approved a request of the Technical Committee on Special Operations Protective Clothing and Equipment to develop a new standard on the selection, care, and maintenance of protective ensembles for technical rescue. The new standard was intended to be a companion document to 1951, *Standard on Protective Ensembles for Technical Rescue Incidents*.

Following Standards Council approval, the Technical Committee established a task group to develop the new standard. When the task group completed its work, the Technical Committee reviewed the draft document, and both the Technical Committee and the Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment were balloted. In October 2010, the draft standard, the results of the Technical Committee and Technical Correlating Committee ballot, and a request to enter a Fall 2012 revision cycle were submitted to the Standards Council.

The Standards Council approved the request, and the new standard, NFPA 1855, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents*, opened for public proposals in January 2011. Seventy-eight proposals to the standard were received by the proposal closing date of May 23, 2011. The Technical Committee met in July 2011 to review the proposals, and the Report on Proposals (ROP) was published in December 2011. During the public comment period, 47 comments were received, and the Technical Committee met in March 2012 to review those comments. The Report on Comments (ROC) was published in August 2012.

This first edition of NFPA 1855, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents*, featured chapters on the program; selection; inspection; cleaning and decontamination; repair; storage; retirement, disposition, and special incident procedure; verification; and test procedures of protective ensembles related to technical rescue incidents.

The 2018 edition has a few updates. The major changes are removal of the CBRN requirements as well as the hood references because hoods were part of the CBRN ensemble. The standard no longer allows use of a center post agitator for washing purposes.

Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment

William E. Haskell, III, *Chair*

National Institute for Occupational Safety & Health, MA [E]
Rep. National Institute for Occupational Safety & Health

Jason L. Allen, Intertek Testing Services, NY [RT]

James B. Area, Chimera Enterprises International, MD [SE]

Joseph Arrington, San Antonio Fire Department, TX [U]

Roger L. Barker, North Carolina State University, NC [SE]

James E. Brinkley, International Association of Fire Fighters, DC [L]
Rep. International Association of Fire Fighters

Steven D. Corrado, UL LLC, NC [RT]

Cristine Z. Fargo, International Safety Equipment Association, VA [M]

Edmund Farley, Pittsburgh Bureau Of Fire, PA [E]

Robert A. Freese, Globe Manufacturing Company, NH [M]

Patricia A. Gleason, ASTM/Safety Equipment Institute (SEI), VA [RT]

David V. Haston, US Department of Agriculture, ID [E]

Diane B. Hess, PBI Performance Products, Inc., NC [M]

Thomas M. Hosea, US Department of the Navy, FL [RT]

James S. Johnson, Lawrence Livermore National Laboratory, CA [RT]

Jeff Legendre, Northborough Fire Department, MA [U]

Karen E. Lehtonen, Lion Group, Inc., OH [M]

Gregory J. Mackin, Boston Fire Department, MA [E]

David G. Matthews, Fire & Industrial (PPE) Ltd., United Kingdom [SE]

Rep. International Standards Organization

Benjamin Mauti, Mine Safety Appliances Company, PA [M]

Rep. Compressed Gas Association

Michael F. McKenna, Michael McKenna & Associates, LLC, CA [SE]

John H. Morris, Johnson Controls/TYCO/Scott Safety, GA [M]

Jack E. Reall, Columbus (OH) Division of Fire, OH [L]

Rep. Columbus Firefighters Union

Jeffrey O. Stull, International Personnel Protection, Inc., TX [M]

Tim W. Tomlinson, Addison Fire Department, TX [C]

Robert D. Tutterow, Jr., Fire Industry Equipment Research Organization (FIERO), NC [U]

Rep. NFPA Fire Service Section

William A. Van Lent, Veridian Ltd., Inc., IA [M]

Rep. Fire & Emergency Manufacturers & Services Association

Bruce H. Varner, BHVarner & Associates, AZ [M]

Rep. International Fire Service Training Association

Steven H. Weinstein, Honeywell Safety Products, CA [M]

Richard Weise, Los Angeles County Fire Department, CA [U]

Harry P. Winer, HIP Consulting LLC, MA [SE]

Alternates

Louis Carpentier, Innotex Inc., Canada [M]

(Alt. to William A. Van Lent)

Patricia A. Freeman, Globe Manufacturing Company, LLC, NH [M]

(Alt. to Robert A. Freese)

Tim J. Gardner, 3M Company, MN [M]

(Alt. to Cristine Z. Fargo)

Pamela A. Kavalesky, Intertek Testing Services, NY [RT]

(Alt. to Jason L. Allen)

Judge W. Morgan, Scott Safety, NC [M]

(Alt. to John H. Morris)

Gary L. Neilson, Sparks, NV [U]

(Alt. to Robert D. Tutterow, Jr.)

Amanda H. Newsom, UL LLC, NC [RT]

(Alt. to Steven D. Corrado)

Anthony Petrilli, US Department of Agriculture, MT [E]

(Alt. to David V. Haston)

Stephen R. Sanders, ASTM/Safety Equipment Institute (SEI), VA [RT]

(Alt. to Patricia A. Gleason)

Russell Shephard, Australasian Fire & Emergency Service Authorities Council, Australia [SE]

(Alt. to David G. Matthews)

David P. Stoddard, Michael McKenna & Associates, LLC, CA [SE]

(Alt. to Michael F. McKenna)

Grace G. Stull, International Personnel Protection, Inc., TX [M]

(Alt. to Jeffrey O. Stull)

Rick L. Swan, IAFF Local 2881/CDF Fire Fighters, VA [L]

(Alt. to James E. Brinkley)

Jonathan V. Szalajda, National Institute for Occupational Safety & Health, PA [E]

(Alt. to William E. Haskell, III)

Donald B. Thompson, North Carolina State University, NC [SE]

(Alt. to Roger L. Barker)

W. Jason Traynor, MSA Safety, PA [M]

(Alt. to Benjamin Mauti)

Jian Xiang, The DuPont Company, Inc., VA [M]

(Alt. to Diane B. Hess)

Nonvoting

Robert J. Athanas, FDNY/SAFE-IR, Incorporated, NY [U]

Rep. TC on Electronic Safety Equipment

Christina M. Baxter, U.S. Department of Defense, VA [E]

Rep. TC on Hazardous Materials PC&E

Tricia L. Hock, ASTM/Safety Equipment Institute (SEI), VA [RT]

Rep. TC on Emergency Medical Services PC&E

Stephen J. King, Babylon, NY [SE]

Rep. TC on Structural and Proximity Fire Fighting PC&E

Jeremy Metz, West Metro Fire Rescue, CO [U]

Rep. TC on Special Operations PC&E

Brian Montgomery, U.S. Department of Justice, DC [E]

Rep.

Daniel N. Rossos, Oregon Department of Public Safety Standards & Training, OR [E]

Rep. TC on Respiratory Protection Equipment

Chris Farrell, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

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.

Technical Committee on Special Operations Protective Clothing and Equipment

Jeremy Metz, *Chair*
West Metro Fire Rescue, CO [U]

Karen E. Lehtonen, *Secretary*
Lion Group, Inc., OH [M]

Jason L. Allen, Intertek Testing Services, NY [RT]
Joseph Arrington, San Antonio Fire Department, TX [U]
Richard J. Broccolo, Orange County Fire Rescue, FL [U]
Steven D. Corrado, UL LLC, NC [RT]
Paul Dacey, W. L. Gore & Associates, MD [M]
Keith B. Dempsey, City of Dalton Fire Department, GA [C]
Stephen J. Geraghty, Fire Department City of New York, NY [U]
Rep. Fire Department City of New York
William E. Haskell, III, National Institute for Occupational Safety & Health, MA [E]
Rep. National Institute for Occupational Safety & Health
Diane B. Hess, PBI Performance Products, Inc., NC [M]
Tricia L. Hock, ASTM/Safety Equipment Institute (SEI), VA [RT]
Gavin P. Horn, University of Illinois Fire Service Institute, IL [SE]
Thomas Howard, New York Division of Homeland Security & Emergency Services, NY [E]

Kim Klaren, Fairfax County Fire & Rescue Department, VA [U]
George R. Krause, II, Globe Manufacturing Company, Inc., NH [M]
Stephen Legros, City of Yuma Fire Department, AZ [U]
Loui McCurley, PMI, CO [M]
Robert G. Nelson, Chula Vista Fire Department, CA [U]
H. Dean Paderick, Special Rescue International, VA [SE]
Jack E. Reall, Columbus (OH) Division of Fire, OH [L]
Rep. Columbus Firefighters Union
Cedric Smith, CMC Rescue, Inc., CA [M]
Michael T. Stanhope, TenCate/Southern Mills, Inc., GA [M]
R. Douglas Stephenson, City of Johns Creek Fire Department, TN [U]
Robert Stinton, Diving Unlimited International Inc., CA [M]

Alternates

Brian J. Beechner, Orange County Fire Rescue Department, FL [U]
(Alt. to Richard J. Broccolo)
Jeffrey S. Bowles, PMI Denver, CO [M]
(Alt. to Loui McCurley)
Jamey B. Brads, Special Rescue International, VA [SE]
(Alt. to H. Dean Paderick)
Charles S. Dunn, TenCate/Southern Mills, GA [M]
(Alt. to Michael T. Stanhope)
Patricia A. Freeman, Globe Manufacturing Company, LLC, NH [M]
(Alt. to George R. Krause, II)
Gregory Gould, New York State Division of Homeland Security & Emergency Services-OFPC, NY [E]
(Alt. to Thomas Howard)
Daniel Hudson, City of Dalton Fire Department, GA [C]
(Alt. to Keith B. Dempsey)
Pamela A. Kavalesky, Intertek Testing Services, NY [RT]
(Alt. to Jason L. Allen)
John McKently, CMC Rescue, Inc., CA [M]
(Alt. to Cedric Smith)

Chris Farrell, NFPA Staff Liaison

Craig P. Mignogno, Columbus Firefighters Union, IAFF67, OH [L]
(Alt. to Jack E. Reall)
Dean D. Moran, ASTM/Safety Equipment Institute (SEI), VA [RT]
(Alt. to Tricia L. Hock)
James E. Murray, Fire Department City of New York, NY [U]
(Alt. to Stephen J. Geraghty)
Faith Ortins, Diving Unlimited International Inc., CA [M]
(Alt. to Robert Stinton)
Jeffrey D. Palcic, National Institute for Occupational Safety and Health, PA [E]
(Alt. to William E. Haskell, III)
Jon Saito, West Metro Fire Rescue, CO [U]
(Alt. to Jeremy Metz)
Ashley M. Scott, Lion Group, Inc., OH [M]
(Alt. to Karen E. Lehtonen)
Brian P. Shiels, PBI Performance Products, Inc., NC [M]
(Alt. to Diane B. Hess)
Beverly Wooten Stutts, UL LLC, NC [RT]
(Alt. to Steven D. Corrado)

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on special operations protective clothing and protective equipment, except respiratory equipment, that provides hand, foot, torso, limb, head, and interface protection for fire fighters and other emergency services responders during incidents involving special operations functions including, but not limited to, structural collapse, trench rescue, confined space entry, urban search and rescue, high angle/mountain rescue, vehicular extraction, swift water or flooding rescue, contaminated water diving, and air operations.

This Committee shall also have primary responsibility for documents on station/work uniform garments that are not of themselves primary protective garments but can be combined with a primary protective garment to serve dual or multiple functions.

Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of special operations protective clothing and equipment by fire and emergency services organizations and personnel.

Contents

Chapter 1 Administration	1855– 7	7.2 Routine Cleaning.	1855– 19
1.1 Scope.	1855– 7	7.3 Advanced Cleaning and Decontamination. ...	1855– 19
1.2 Purpose.	1855– 7	7.4 Drying Procedures.	1855– 20
1.3 Application.	1855– 7		
1.4 Units.	1855– 8	Chapter 8 Repair	1855– 20
Chapter 2 Referenced Publications	1855– 8	8.1 Requirements for All Ensembles and Ensemble Elements.	1855– 20
2.1 General.	1855– 8	8.2 Basic and Advanced Garment Element Repair.	1855– 21
2.2 NFPA Publications.	1855– 8	8.3 Additional Requirements for Basic Garment Element Repair.	1855– 21
2.3 Other Publications.	1855– 8	8.4 Additional Requirements for Advanced Garment Element Repair.	1855– 21
2.4 References for Extracts in Mandatory Sections. (Reserved)	1855– 8	8.5 Helmet Element Repair.	1855– 22
Chapter 3 Definitions	1855– 8	8.6 Glove Element Repair.	1855– 22
3.1 General.	1855– 8	8.7 Footwear Element Repair.	1855– 22
3.2 NFPA Official Definitions.	1855– 8	8.8 Goggle Element Repair.	1855– 22
3.3 General Definitions.	1855– 9	Chapter 9 Storage	1855– 22
Chapter 4 Program	1855– 12	9.1 All Ensembles and Ensemble Elements.	1855– 22
4.1 General.	1855– 12	Chapter 10 Retirement, Disposition, and Special Incident Procedure	1855– 22
4.2 Program Organization for Technical Rescue Protective Ensembles and Ensemble Elements.	1855– 13	10.1 Retirement.	1855– 22
4.3 Records.	1855– 14	10.2 Disposition of Retired Elements.	1855– 23
4.4 Manufacturer's Instructions.	1855– 14	10.3 Special Incident Procedure.	1855– 23
4.5 Protecting the Public and Personnel from Contamination.	1855– 14	Chapter 11 Verification	1855– 23
4.6 Reporting Personal Protective Equipment Health and Safety Concerns.	1855– 14	11.1 General.	1855– 23
Chapter 5 Selection	1855– 14	11.2 Verification Program.	1855– 23
5.1 General.	1855– 14	11.3 Inspection and Testing.	1855– 24
5.2 Risk Assessments.	1855– 14	11.4 Organization or ISP Quality Management Program.	1855– 26
5.3 Purchase.	1855– 16	Chapter 12 Test Procedures	1855– 27
Chapter 6 Inspection	1855– 16	12.1 Water Penetration Barrier Evaluation.	1855– 27
6.1 General.	1855– 16	12.2 Footwear Water Resistance Evaluation.	1855– 27
6.2 Routine Inspection.	1855– 16	Annex A Explanatory Material	1855– 28
6.3 Advanced Inspection.	1855– 17	Annex B Informational References	1855– 45
6.4 Complete Barrier Inspection.	1855– 18	Index	1855– 47
Chapter 7 Cleaning and Decontamination	1855– 18		
7.1 General.	1855– 18		

NFPA 1855

Standard on

Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents

2018 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading “Important Notices and Disclaimers Concerning NFPA Standards.” They can also be viewed at www.nfpa.org/disclaimers or obtained on request from NFPA.

UPDATES, ALERTS, AND FUTURE EDITIONS: New editions of NFPA codes, standards, recommended practices, and guides (i.e., NFPA Standards) are released on scheduled revision cycles. This edition may be superseded by a later one, or it may be amended outside of its scheduled revision cycle through the issuance of Tentative Interim Amendments (TIAs). An official NFPA Standard at any point in time consists of the current edition of the document, together with all TIAs and Errata in effect. To verify that this document is the current edition or to determine if it has been amended by TIAs or Errata, please consult the National Fire Codes® Subscription Service or the “List of NFPA Codes & Standards” at www.nfpa.org/docinfo. In addition to TIAs and Errata, the document information pages also include the option to sign up for alerts for individual documents and to be involved in the development of the next edition.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1 Scope.

Δ 1.1.1 This standard shall specify the minimum selection, care and maintenance requirements for utility technical rescue protective ensembles, rescue and recovery technical rescue protective ensembles, and the individual ensemble elements, including garments, helmets, gloves, footwear, and interface components, that are compliant with NFPA 1951.

Δ 1.1.2 This standard shall also specify requirements for urban search and rescue (USAR) operation protective ensembles, ensemble elements, clothing, and equipment certified as compliant with the 2001 edition of NFPA 1951.

1.1.3 This standard shall not specify requirements for other organizational programs such as appropriate use of technical rescue protective ensembles for training, operations, or infection control, because these programs are under the jurisdiction of other NFPA standards.

Δ 1.1.4 This standard shall not apply to protective ensembles or protective clothing that is compliant with NFPA 1971, NFPA 1977, NFPA 1991, NFPA 1992, NFPA 1994, and NFPA 1999.

1.1.5 This standard shall not be construed as addressing all the safety concerns associated with the use of compliant protective ensembles or ensemble elements. The persons and organizations that use compliant protective ensembles or ensemble elements shall be responsible for establishing safety and health practices and for determining the applicability of regulatory limitations prior to use.

1.1.6 This standard shall not be construed as addressing all the safety concerns, if any, associated with the use of this standard by testing or repair facilities. The persons and organizations that use this standard shall be responsible for conducting testing of protective ensembles or ensemble elements to establish safety and health practices and for determining the applicability of regulatory limitations prior to using this standard for any designing, manufacturing, and testing.

1.1.7 Nothing herein shall restrict any jurisdiction from exceeding these minimum requirements.

1.2 Purpose.

Δ 1.2.1 The purpose of this standard shall be to establish a program for utility technical rescue protective ensembles, rescue and recovery technical rescue protective ensembles, and ensemble elements to reduce the safety risks and potential health risks associated with poorly maintained, contaminated, or damaged protective ensembles and ensemble elements.

Δ 1.2.2 The purpose of this standard shall also be to establish basic criteria for selection, inspection, cleaning, decontamination, repair, storage, and retirement of utility technical rescue protective ensembles, rescue and recovery technical rescue protective ensembles, and ensemble elements.

1.3 Application.

Δ 1.3.1 This standard shall apply to technical rescue protective ensembles and ensemble elements certified as compliant with NFPA 1951.

Δ 1.3.2 This standard shall also apply to urban search and rescue (USAR) operations protective ensembles and ensemble elements certified as compliant with the 2001 edition of NFPA 1951.

1.3.3 This standard shall not apply to other organizational programs such as appropriate use of technical rescue protective ensembles for training, operations, or infection control, because such programs are under the jurisdiction of other NFPA standards.

Δ 1.3.4 This standard shall not apply to respiratory protective equipment.

1.3.5 The requirements of this standard shall not apply to accessories attached to any element of the technical rescue protective ensemble unless specifically addressed herein.

1.4 Units.

1.4.1 In this standard, values for measurement are followed by an equivalent in parentheses, but only the first stated value shall be regarded as the requirement.

1.4.2 Equivalent values in parentheses shall not be considered as the requirement because these values are approximate.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 70E®, *Standard for Electrical Safety in the Workplace*®, 2018 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2018 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2017 edition.

NFPA 1951, *Standard on Protective Ensembles for Technical Rescue Incidents*, 2013 edition.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2018 edition.

NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, 2016 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2018 edition.

NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies and CBRN Terrorism Incidents*, 2016 edition.

NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies*, 2018 edition.

NFPA 1994, *Standard on Protective Ensembles for First Responders to Hazardous Materials Emergencies and CBRN Terrorism Incidents*, 2018 edition.

NFPA 1999, *Standard on Protective Clothing and Ensembles for Emergency Medical Operations*, 2018 edition.

2.3 Other Publications.

2.3.1 ACGIH Publications. American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH 45240-1634.

ACGIH Publication No. 0115, *2015 TLVs and BEIs*, 2015.

▲ **2.3.2 ISO Publications.** International Organization for Standardization, ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.

ISO 17011, *Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies*, 2004.

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, 2005.

ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes, and services*, 2012.

2.3.3 U.S. Government Publications. U.S. Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

NIOSH Publication No 2005-149, *NIOSH Pocket Guide to Chemical Hazards*, September 2005.

USFA, *Protective Clothing and Equipment Need of Emergency Responders to US&R Missions*, 1993.

2.3.4 Other Publications.

Lewis, R., *Hazardous Chemicals Desk Reference*, John Wiley & Sons, New York, 2002.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections. (Reserved)

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall

be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Accessory/Accessories. An item, or items, that could be attached to a certified product but that is not necessary for the certified product to meet the requirements of the standard.

3.3.2 Advanced Cleaning. See 3.3.8.1.

3.3.3 Body Fluids. Fluids that are produced by the body, including, but not limited to, blood, semen, mucus, feces, urine, vaginal secretions, breast milk, amniotic fluids, cerebrospinal fluid, synovial fluid, and pericardial fluid.

3.3.4 Carcinogen/Carcinogenic. A cancer-causing substance that is identified in one of several published lists, including, but not limited to, *NIOSH Pocket Guide to Chemical Hazards*, *Hazardous Chemicals Desk Reference*, and *ACGIH 2015 TLVs and BEIs*.

3.3.5 Care. Procedures for cleaning, decontamination, and storage of protective clothing and equipment.

3.3.6 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 a specific standard(s), authorizes the manufacturer to use a label on listed products that comply with the requirements of that standard(s), 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 that standard(s).

3.3.7 Char. The formation of a brittle residue when material is exposed to thermal energy.

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

3.3.8.1* Advanced Cleaning. The thorough cleaning of ensembles or elements by washing with cleaning agents.

3.3.8.2* Routine Cleaning. The light cleaning of ensembles or ensemble elements performed by the end user without taking the elements out of service.

3.3.8.3* Specialized Cleaning. Cleaning to remove hazardous materials or body fluids.

3.3.9 Coat. See 3.3.76, *Rescue* and *Recovery Technical Rescue Protective Garment Element*, and 3.3.108, *Utility Technical Rescue Protective Garment Element*.

3.3.10 Collar. The portion of a coat or coverall that encircles the neck.

3.3.11 Collar Lining. That part of collar fabric composite that is next to the skin when the collar is closed in the raised position.

3.3.12 Compliance/Compliant. Meeting or exceeding all applicable requirements of this standard.

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

3.3.14 Composite. The layer or layers of materials or components.

3.3.15 Confined Space Entry. An activity of rescue that takes place in a space that is large enough and so configured that a person can bodily enter and perform assigned work, that has limited restricted means for entry or exit (e.g., tanks, vessels, silos, storage bins, hoppers, vaults, and pits), and that is not designed for continuous occupancy.

3.3.16 Contamination/Contaminated. The process by which ensembles and ensemble elements are exposed to hazardous materials or body fluids.

3.3.17 Coverall. See 3.3.76, *Rescue* and *Recovery Technical Rescue Protective Garment Element*, and 3.3.108, *Utility Technical Rescue Protective Garment Element*.

3.3.18 Craze. The appearance of fine cracks in the surface of a helmet shell or other smooth surface of an ensemble element.

3.3.19 Cross-Contamination. The transfer of contamination from one item to another or to the environment.

3.3.20 Crown. The portion of the helmet that covers the head above the reference plane.

3.3.21 Crown Straps. See 3.3.88.2.

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

3.3.23 Disinfectant. An agent that destroys, neutralizes, or inhibits the growth of harmful biological agents.

3.3.24 Elasticity. The ability of a material to return to its original form after being stretched.

3.3.25 Elements. See 3.3.30, *Ensemble Elements*.

3.3.26 Embrittlement. The hardening of a material that makes it susceptible to easy fracture.

3.3.27* Emergency Medical Operations. Delivery of emergency patient care, including patient transportation, provided prior to arrival at a hospital or other health care facility.

3.3.28 Energy Absorbing System. Materials or systems used to attenuate impact energy.

3.3.29 Ensemble. See 3.3.73, *Rescue* and *Recovery Technical Rescue Protective Ensemble*, and 3.3.105, *Utility Technical Rescue Protective Ensemble*.

3.3.30* Ensemble Elements. The certified (individually) products that provide protection to the upper and lower torso, arms, legs, head, hands, and feet.

3.3.31 Field Evaluation. The nonlaboratory assessment of an ensemble, ensemble element, or item.

3.3.32 Fit. The quality, state, and manner in which clothing and equipment, when worn, relate to the human body.

3.3.33 Flame Resistance. The property of a material whereby combustion is prevented, terminated, or inhibited following the application of a flaming or nonflaming source of ignition, with or without subsequent removal of the ignition source.

Flame resistance can be an inherent property of a material, or it can be imparted by specific treatment. (See also 3.3.51, *Inherent Flame Resistance*.)

3.3.34 Flammable or Explosive Atmospheres. Atmospheres containing solids, liquids, vapors, or gases at concentrations that will burn or explode if ignited.

3.3.35 Flash Fire. A fire that rapidly spreads through a diffuse fuel, such as a dust, gas, or the vapors of an ignitable liquid, without the production of damaging pressure.

▲ **3.3.36 Footwear.** See 3.3.75, *Rescue* and Recovery Technical Rescue Protective Footwear Element, and 3.3.107, Utility Technical Rescue Protective Footwear Element.

3.3.37 Footwear Upper. The portion of the protective footwear element above the sole, heel, and insole.

3.3.38 Functional. The ability of an ensemble element or component of an ensemble element to continue to be utilized for its intended purpose.

▲ **3.3.39 Garment.** See 3.3.76, *Rescue* and Recovery Technical Rescue Protective Garment Element, and 3.3.108, Utility Technical Rescue Protective Garment Element.

3.3.40 Gauntlet. An interface component of the protective glove element that provides limited protection to the coat/glove interface area.

▲ **3.3.41 Glove.** See 3.3.95, Technical Rescue Protective Gloves, and 3.3.109, Utility Technical Rescue Protective Glove Element.

3.3.42 Glove Barrier. The innermost component of the glove body composite that comes in contact with the wearer's skin.

3.3.43 Glove Body. The part of the glove that extends from the tip of the fingers to the wrist crease or a specified distance beyond the wrist crease.

3.3.44 Glove Wristlet. See 3.3.116, Wristlet.

3.3.45* Goggles. The component that provides limited protection to the wearer's eyes.

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

3.3.47* Hazardous Materials. Substances (solid, liquid, or gas) that when released are capable of creating harm to people, the environment, and property.

3.3.48 Hazardous Materials Emergencies. Incidents involving the release or potential release of hazardous materials.

▲ **3.3.49 Helmet.** See 3.3.78, *Rescue* and Recovery Technical Rescue Protective Helmet Element, and 3.3.111, Utility Technical Rescue Protective Helmet Element.

• **3.3.50 Independent Service Provider (ISP).** See 3.3.112, Verified Independent Service Provider (ISP).

3.3.51 Inherent Flame Resistance. Flame resistance that is derived from the essential characteristics of the fiber or polymer.

3.3.52 Interface Area. An area of the body where the protective garments, helmet, gloves, footwear, or respiratory protection facepiece meet. Interface areas include, but are not limited to, the coat/helmet/respiratory protection facepiece

area; the coat/trouser area; the coat/glove area; and the trouser/footwear area.

3.3.53* Interface Component(s). Any material, part, or subassembly used in the construction of the compliant product that provides limited protection to interface areas.

3.3.54* Item. The individual compliant products consisting of protective clothing, protective equipment, auxiliary equipment, and supplementary equipment or tools.

3.3.55 Maintenance. The inspection, service, and repair of protective clothing and equipment, including the determination for removal from service.

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

3.3.57 Melt. A response to heat by a material resulting in evidence of flowing or dripping.

3.3.58 Operations.

3.3.58.1 Search Operations. Any land-based operations involving the search for victims or body recovery.

3.3.58.2 Technical Rescue Incidents. Those activities directed at locating endangered persons, removing endangered persons from danger, treating the injured at an emergency incident, and providing transport to an appropriate health care facility.

3.3.59* Organization. The entity that provides the direct management and supervision for the emergency services personnel.

3.3.59.1 Manufacturer Trained Organization. A nonverified organization trained by an element manufacturer of the same element type to conduct any one or a combination of advanced cleaning, advanced inspection, and basic repair of the organization's elements.

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

• **3.3.60 Outer Shell.** The outermost component of an ensemble element or item, not including trim, hardware, reinforcing material, pockets, wristlet material, accessories, fittings, or suspension systems.

▲ **3.3.61 Protective Clothing.** See 3.3.73, *Rescue* and Recovery Technical Rescue Protective Ensemble, and 3.3.105, Utility Technical Rescue Protective Ensemble.

▲ **3.3.62 Protective Coat.** See 3.3.74, *Rescue* and Recovery Technical Rescue Protective Ensemble Elements, and 3.3.106, Utility Technical Rescue Protective Ensemble Elements.

▲ **3.3.63 Protective Coverall.** See 3.3.74, *Rescue* and Recovery Technical Rescue Protective Ensemble Elements, and 3.3.106, Utility Technical Rescue Protective Ensemble Elements.

▲ **3.3.64 Protective Ensemble.** See 3.3.73, *Rescue* and Recovery Technical Rescue Protective Ensemble, and 3.3.105, Utility Technical Rescue Protective Ensemble.

▲ **3.3.65 Protective Footwear.** See 3.3.75, **Rescue and Recovery Technical Rescue Protective Footwear Element**, and 3.3.107, **Utility Technical Rescue Protective Footwear Element**.

▲ **3.3.66 Protective Garment.** See 3.3.76, **Rescue and Recovery Technical Rescue Protective Garment Element**, and 3.3.108, **Utility Technical Rescue Protective Garment Element**.

▲ **3.3.67 Protective Glove.** See 3.3.95, **Technical Rescue Protective Gloves**, and 3.3.109, **Utility Technical Rescue Protective Glove Element**.

3.3.68 Protective Goggle. See 3.3.77, **Rescue and Recovery Technical Rescue Protective Goggle Element**, and 3.3.110, **Utility Technical Rescue Protective Goggle Element**.

▲ **3.3.69 Protective Helmet.** See 3.3.78, **Rescue and Recovery Technical Rescue Protective Helmet Element**, and 3.3.111, **Utility Technical Rescue Protective Helmet Element**.

•
▲ **3.3.70 Protective Trouser.** See 3.3.76, **Rescue and Recovery Technical Rescue Protective Garment Element**, and 3.3.108, **Utility Technical Rescue Protective Garment Element**.

3.3.71 Puncture-Resistant Device. A reinforcement to the bottom of protective footwear that is designed to provide puncture resistance.

•
3.3.72 Recovery. An operation involving the retrieval of either the remains of a deceased victim or property, but in no case a living person.

3.3.73 Rescue and Recovery Technical Rescue Protective Ensemble. Multiple elements of compliant protective clothing and protective equipment designed and configured as an ensemble to provide limited protection in operational settings where exposure to physical, thermal, liquid, and body fluid-borne pathogen hazards is expected.

3.3.74 Rescue and Recovery Technical Rescue Protective Ensemble Elements. The parts that comprise the rescue and recovery technical rescue protective ensemble, that include coats, trousers, coveralls, helmets, gloves, footwear, and interface components.

3.3.75 Rescue and Recovery Technical Rescue Protective Footwear Element. The element of the certified rescue and recovery technical rescue protective ensemble that provides protection to the foot, ankle, and lower leg.

3.3.76 Rescue and Recovery Technical Rescue Protective Garment Element. The coat, trouser, or coverall element of the certified rescue and recovery technical rescue protective ensemble that provides protection to the upper and lower torso, arms, and legs.

3.3.77 Rescue and Recovery Technical Rescue Protective Goggle Element. The element of the certified rescue and recovery technical rescue protective ensemble that provides partial protection to the face and eyes.

3.3.78 Rescue and Recovery Technical Rescue Protective Helmet Element. The element of the certified rescue and recovery technical rescue protective ensemble that provides protection to the head.

3.3.79 Retirement. The process of permanently removing an ensemble element from emergency operations service in the organization.

3.3.80 Seam. Any permanent attachment of two or more materials in a line formed by joining the separate material pieces.

3.3.80.1 Major A Seam. Outermost layer seam assemblies where rupture could reduce the protection of the garment by exposing the garment's inner layers, and/or the wearer's station/work uniform, other clothing, or skin.

3.3.80.2 Major B Seam. Inner layer 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.

3.3.80.3* Minor Seam. Remaining seam assemblies that are not classified as Major A or Major B seams.

3.3.81 Selection. The process of determining what protective clothing and equipment (PCE) is necessary for protection of fire and emergency services response personnel from an anticipated specific hazard or other activity, the procurement of the appropriate PCE, and the choice of the proper PCE for a specific hazard or activity at an emergency incident.

3.3.82 Separate/Separation. A material response evidenced by splitting or delaminating.

3.3.83 Service Life. The period for which a compliant product can be useful before retirement.

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

3.3.85 Site Stabilization. Those activities directed at mitigating the dangerous elements of an emergency situation.

▲ **3.3.86 Soiled/Soiling.** The accumulation of materials that are not considered hazardous materials or body fluids but that could degrade the performance of the ensemble or ensemble element.

3.3.87 Specialized Cleaning. See 3.3.8.3.

3.3.88 Strap.

3.3.88.1 Chin Strap. An adjustable strap for the helmet that fits under the chin to help secure the helmet to the head.

3.3.88.2 Crown Straps. The part of the helmet suspension that passes over the head.

3.3.89 Stress Area. Those areas of the garment that are subjected to more wear, including, but not limited to, crotches, knees, elbows, and shoulders.

3.3.90 Suspension. The energy attenuating system of the helmet that is made up of the headband and crown strap.

3.3.91 Technical Rescue Incidents. Complex rescue incidents requiring specially trained personnel and special equipment to complete the mission.

▲ **3.3.92 Technical Rescue Protective Ensembles.** See 3.3.73, **Rescue and Recovery Technical Rescue Protective Ensemble**, and 3.3.105, **Utility Technical Rescue Protective Ensemble**.

▲ **3.3.93 Technical Rescue Protective Footwear.** See 3.3.75, **Rescue and Recovery Technical Rescue Protective Footwear Element**, and 3.3.107, **Utility Technical Rescue Protective Footwear Element**.

△ 3.3.94 **Technical Rescue Protective Garments.** See 3.3.76, Rescue and Recovery Technical Rescue Protective Garment Element, and 3.3.108, Utility Technical Rescue Protective Garment Element.

△ 3.3.95 **Technical Rescue Protective Gloves.** See 3.3.109, Utility Technical Rescue Protective Glove Element.

3.3.96 **Technical Rescue Protective Goggles.** See 3.3.77, Rescue and Recovery Technical Rescue Protective Goggle Element, and 3.3.110, Utility Technical Rescue Protective Goggle Element.

△ 3.3.97 **Technical Rescue Protective Helmets.** See 3.3.78, Rescue and Recovery Technical Rescue Protective Helmet Element, and 3.3.111, Utility Technical Rescue Protective Helmet Element.

• 3.3.98 **Tensile Strength.** The force at which a fiber or fabric will break when pulled in one dimension.

3.3.99 **Textile Fabric.** A planar structure consisting of yarns or fibers.

3.3.100 **Toecap.** A reinforcement to the toe area of footwear designed to protect the toes from impact and compression.

3.3.101 **Torso.**

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

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

•
△ 3.3.102 **Trouser.** See 3.3.76, Rescue and Recovery Technical Rescue Protective Garment Element, and 3.3.108, Utility Technical Rescue Protective Garment Element.

3.3.103* **Universal Precautions.** An approach to infection control in which human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

3.3.104 **Utility Sink.** A separate sink used for cleaning ensembles, and ensemble elements and items.

3.3.105 **Utility Technical Rescue Protective Ensemble.** Multiple elements of protective clothing and protective equipment designed and configured as an ensemble to provide limited protection in operational settings where exposure to physical and thermal hazards are expected.

3.3.106 **Utility Technical Rescue Protective Ensemble Elements.** The parts that comprise the utility technical rescue protective ensemble, that include coats, trousers, coveralls, helmets, gloves, footwear, and interface components.

3.3.107 **Utility Technical Rescue Protective Footwear Element.** An element of the utility technical rescue protective ensemble that provides protection to the foot, ankle, and lower leg that is certified to the utility protection requirements.

3.3.108 **Utility Technical Rescue Protective Garment Element.** The coat, trouser, or coverall of the certified utility technical rescue protective ensemble that provides protection to the upper and lower torso, arms, and legs.

3.3.109 **Utility Technical Rescue Protective Glove Element.** The element of the certified utility technical rescue protective ensemble that provides protection to the hand.

3.3.110 **Utility Technical Rescue Protective Goggle Element.** The element of the certified utility technical rescue protective ensemble that provides partial protection to the face and eyes.

3.3.111 **Utility Technical Rescue Protective Helmet Element.** The element of the certified utility technical rescue protective ensemble that provides protection to the head.

3.3.112 **Verified Independent Service Provider (ISP).** An independent service provider verified by a third-party certification organization to conduct any one or a combination of advanced inspection, advanced cleaning, basic repair, or advanced repair service.

3.3.113 **Verified/Verification.** A system whereby a certification organization determines that an ISP or an organization has demonstrated the ability to conduct repairs that complies with the requirements of this standard, authorizes the ISP or organization to use a verification mark that complies with the requirements of this standard, and establishes a follow-up program conducted by the certification organization as a check on the methods of repair used to determine continued compliance with the requirements of this standard.

3.3.114* **Visibility Markings.** Retroreflective and fluorescent conspicuity enhancements.

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

3.3.116 **Wristlet.** The interface component of the protective element or item that provides limited protection to the coat/glove interface area.

Chapter 4 Program

4.1 General.

4.1.1* The organization shall develop and implement a program for the selection, care, and maintenance of utility technical rescue ensembles, rescue and recovery technical rescue ensembles, and ensemble elements used by the members of the organization in the performance of their assigned functions.

4.1.2 This program shall have the goal of providing technical rescue protective ensembles and ensemble elements that are suitable and appropriate for the intended use; maintaining such protective ensembles and ensemble elements in a safe, usable condition to provide the intended protection to the user; removing from use such protective ensembles and ensemble elements that could cause or contribute to user injury, illness, or death because of their condition; and reconditioning, repairing, or retiring such protective ensembles and ensemble elements.

4.1.3 Where this program for the selection, care, and maintenance of technical rescue protective ensembles and ensemble elements is part of an organization's overall program on protective clothing and protective equipment, the portion of the organization's overall program that affects technical rescue protective ensembles and ensemble elements shall be in accordance with Section 4.2.

4.2 Program Organization for Technical Rescue Protective Ensembles and Ensemble Elements.

4.2.1 The organization's program specified in Section 4.1 shall incorporate at least the requirements in Chapters 4 through 12.

4.2.2* The organization shall develop written standard operating procedures (SOPs) that shall identify and define the various parts of the program and the various roles and responsibilities of the organization and of the members in the program parts specified in Table 4.2.2.

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

4.2.3.1* The organization shall not add or permit accessories to be added to any ensemble or ensemble element where the organization's request for approval has been responded to in writing with a disapproval from the ensemble or ensemble element manufacturer.

4.2.3.2* In the event that the organization cannot make contact with the ensemble or ensemble element manufacturer for a specific accessory to be used on the ensemble or ensemble element, the organization shall be permitted to evaluate the accessory for attachment to an ensemble or ensemble element using recognized tests to determine that the accessory does not degrade the performance of the ensemble or ensemble element.

4.2.3.3* In the event the organization's written requests for permission have not received a reply from the ensemble or

ensemble element manufacturer for a specific accessory to be used on the ensemble or ensemble element, the organization shall be permitted to evaluate the accessory for attachment to an ensemble or ensemble element using recognized tests to determine that the accessory does not degrade the performance of the ensemble or ensemble element.

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

- (1) Manufacturer trained organization for their own organization's elements only
- (2) Verified organization
- (3) Verified ISP

4.2.4.1 Verified organizations and verified ISPs shall meet the requirements of Chapter 11, Verification, and shall be verified by a third-party certification organization.

4.2.4.2 Where the organization is a verified organization or uses a verified ISP, approval from the element manufacturer shall not be required.

4.2.4.3* Verified organizations and verified ISPs shall receive written verification from the third-party certification organization to conduct garment element advanced cleaning, advanced inspection or advanced cleaning, advanced inspection and advanced repair services.

4.2.4.4 The written verification shall indicate that the verified organization or the verified ISP has demonstrated a thorough knowledge of this standard as well as the design and performance requirements of NFPA 1951.

4.2.4.5 All garment advanced repairs shall be conducted by the garment manufacturer, a verified organization, or verified ISP.

4.2.4.6 Manufacturer trained organizations performing advanced cleaning and advanced inspection shall be trained by an element manufacturer of the same element type or by a verified ISP. The element manufacturer or verified ISP shall provide documentation that the organization has received the necessary training.

4.2.5* The organization shall develop specific criteria for removal of protective clothing and equipment from service, in accordance with Chapter 10. The criteria for retirement shall include, but not be limited to, issues that are specific to the ensembles or ensemble elements being used by the organization, the manufacturer's instructions, and the experience of the organization.

Table 4.2.2 Required Program Parts for Technical Rescue Protective Ensembles and Elements

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

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

Responsibilities	MFG	V ISP	V ORG	MT ORG	USER
Routine inspection (6.2)					X
Advanced inspection (6.3)	X	X	X	X	
Complete barrier inspection (6.4)	X	X	X	X	
Routine cleaning (7.2)					X
Advanced cleaning and decontamination (7.3)	X	X	X	X	
Basic repair (8.3)	X	X	X	X	
Advanced repair (8.4)	X	X	X		
Training	X	X			

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

Shaded text = Revisions.  = Text deletions and figure/table revisions. • = Section deletions.  = New material



4.3 Records.

4.3.1* The organization shall compile and maintain records on its technical rescue protective ensembles and ensemble elements.

4.3.2* The records specified in 4.3.1 shall apply to technical rescue protective ensembles and ensemble elements that are utilized by the organization, including rental or loaner protective ensembles and ensemble elements.

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

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

4.4 Manufacturer's Instructions.

4.4.1 When issuing new technical rescue protective ensembles and ensemble elements, the organization shall provide users with the instructions provided by the manufacturer on the care, use, and maintenance of the protective ensembles or ensemble elements, including any warnings provided by the manufacturer.

4.4.2* Where the manufacturer's instructions regarding the care or maintenance of the protective ensembles or elements differ from a specific requirement(s) in this standard, the manufacturer's instructions shall be followed for that requirement(s). Manufacturers shall not be permitted to override the requirements of this standard for third-party verification.

4.4.3 The organization shall retain and make accessible to organization personnel a copy of manufacturers' instructions regarding the care, use, and maintenance of the protective ensembles, for reference purposes.

4.5 Protecting the Public and Personnel from Contamination.

4.5.1 The organization shall develop written SOPs that minimize the public's and the fire department personnel's exposure to soiled or contaminated technical rescue protective ensembles and ensemble elements.

4.5.2* The SOPs shall require that protective ensembles or ensemble elements not be worn or stored in the living areas of organization facilities.

4.5.3* The public shall not be exposed at any time, except during emergency operations, to soiled or potentially contaminated protective ensembles or ensemble elements.

4.5.4 Soiled or potentially contaminated ensembles or ensemble elements shall not be brought into the home, washed in home laundries, or washed in public laundries.

4.6 Reporting Personal Protective Equipment Health and Safety Concerns.

4.6.1* The organization shall report all personal protective equipment (PPE) health and safety concerns, if caused by a known or suspected element failure, to the element manufacturer and certification organization.

4.6.2* The organization shall notify the manufacturer and the certification organization in writing.

4.6.3 The organization shall request written acknowledgment from the element manufacturer and certification organization within 30 days.

Chapter 5 Selection

5.1 General.

5.1.1* The organization shall ensure that elements under consideration are certified as being compliant with NFPA 1951 by a third-party certification organization.

5.1.2* The organization shall ensure that the ensembles and ensemble elements under consideration interface properly with other personal protective items with which they will be used.

5.1.3* Where a field evaluation of an ensemble or ensemble element is conducted, the organization shall establish criteria to ensure a systematic method of comparing products in a manner related to their intended use and assessing their performance relative to the organization's expectations.

5.1.4 Where a utility ensemble is identified, all elements shall be compliant with appropriate utility standards at a minimum.

5.1.5 Where a rescue/recovery ensemble is identified, all elements shall be compliant with appropriate rescue/recovery standards at a minimum.

5.1.6 At a minimum, the organization shall ensure the proper overlap between ensemble elements being used, including, but not limited to, coat to pant, coat to glove, and pants to footwear. Any other specialty equipment being used shall also be considered to ensure the equipment does not interfere with the proper function and interface of the protective ensemble or ensemble elements.

5.2 Risk Assessments.

5.2.1* Prior to starting the selection process of technical rescue protective ensembles and ensemble elements, the organization shall perform a risk assessment.

5.2.2 The risk assessment shall include, but not be limited to, the hazards that can be encountered by technical rescue personnel based on the following items and as detailed in Table 5.2.2, which represents potential hazards identified in the USFA report, *Protective Clothing and Equipment Need of Emergency Responders to US&R Missions*.

- (1) Type of duties performed
- (2) Frequency of use of ensemble elements
- (3) Organization's experiences
- (4) Incident operations
- (5) Geographic location and climate

Table 5.2.2 Risk Assessment

Hazards	Utility	Rescue/Recovery
Falling objects	Helmet	Helmet
Shrapnel from small tool usage	X	X
Projectiles or ballistic objects	—	—
Abrasive or rough surfaces	X	X
Sharp edges	X	X
Pointed objects	X	X
Slippery surfaces	Boots	Boots
Excessive vibration	—	—
High heat and humidity (heat stress)	Garment/best	Garment/better
Ambient cold	—	—
Wetness from tool work	—	X
Rain (inclement weather)	—	X
High wind	—	X
Insufficient or bright light	—	—
Excessive noise	—	—
Chemical inhalation	—	—
Chemical skin absorption	—	Selected liquids
Chemical ingestion or injection	—	—
Liquefied gas contact	—	—
Chemical flash fire	Good	Better
Chemical explosions	—	—
High voltage	Boots	Boots
Electrical arc flash	X (see <i>NFPA 70E</i>)	X (see <i>NFPA 70E</i>)
Static charge buildup	Boots	Boots
Ionization radiation		
Alpha	X	X
Beta	Attenuates	Attenuates
Gamma	—	—
X-ray	—	—
Radiological particulates	—	—
Daytime visibility	X	X
Nighttime visibility	X	X
High convective heat	Garment/low	Garment/low
Low radiant heat	Garment/low	Garment/low
High radiant heat	—	—
Flame impingement	X	X
High pressure steam	—	—
Hot liquids	—	Selected
Molten metals	—	—
Hot solids	—	—
Hot surfaces	—	—
Bloodborne pathogens	—	X
Falling	—	—
Drowning	—	—
Material incompatibility	—	—
Ease of contamination	X	—
Thermal comfort	Garment/best	Garment/better
Range of motion	—	—
Hand function	Gloves	Gloves
Ankle support	Boots	Boots
Back support	—	—
Vision protection	Goggles	Goggles
Communications ease	—	—
Fit (poor)	X	X
Ease of donning and doffing	Gloves	Gloves

Note: An “X” indicates that the ensemble element provides a level of protection from that hazard. An element name indicates that only that element provides a level of protection from that hazard. The terms “good,” “better,” and “best” indicate the level of performance in providing protection from that hazard. A “—” indicates the ensemble does not provide protection from that hazard based on the requirements in NFPA 1951.