

NFPA[®]

1852

**Standard on
Selection, Care, and
Maintenance of
Open-Circuit Self-Contained
Breathing Apparatus (SCBA)**

2019



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NFPA® 1852

Standard on

Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)

2019 Edition

This edition of NFPA 1852, *Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)*, was prepared by the Technical Committee on Respiratory Protection Equipment and released by the Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment. It was issued by the Standards Council on May 4, 2018, with an effective date of May 24, 2018, and supersedes all previous editions.

This edition of NFPA 1852 was approved as an American National Standard on May 24, 2018.

Origin and Development of NFPA 1852

The technical committee was assigned the responsibility of addressing selection, care, and maintenance issues for open-circuit self-contained breathing apparatus (SCBA). To address these issues, the committee developed NFPA 1852, which is oriented to the users of such SCBA and their respective organizations.

This document was developed for organizations that use SCBA for the respiratory protection of their personnel who engage in emergency operations with the goal of reducing the safety risks and potential health risks associated with poorly maintained, contaminated, or damaged SCBA.

This document was also developed to fulfill the SCBA selection, care, and maintenance portions of the overall respiratory protection program required by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, and applies to all SCBA that are certified as compliant with the current and previous editions of NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*.

During the development of this document, committee member Deputy Chief Robert Kolenda of the Pittsburgh, Pennsylvania, Bureau of Fire (PBF) worked tirelessly to develop meaningful requirements to assure the safety of fire and emergency services personnel who depend on SCBA for their respiratory protection and their lives. Chief Kolenda lost his son, Pittsburgh Fire Fighter Marc Kolenda, at a fire, due in part to inadequate protection provided by his SCBA.

The first edition, the 2002 edition of NFPA 1852, was acted on by the NFPA membership at its November Association Technical Meeting in Dallas, Texas, on November 13, 2001, and became effective on January 31, 2002.

In the 2008 edition, the committee processed a complete revision of the document including an overall revision of text for clarity and up-to-date terminology. Section 1.3 was revised and restructured to include later editions of NFPA 1981 and to clarify the documents to which this standard applies. Chapter 2 was revised to include the documents referenced within the mandatory sections of the standard and updated editions approved by the committee. Section 3.3 was reviewed and revised as necessary to update or add new definitions according to the project on Fire and Emergency Services Protective Clothing and Equipment glossary.

Chapter 4 was completely reviewed for upgrades and modifications to existing text as hazards involving SCBA. Section 4.4 (formerly Section 4.3), SCBA Compliance — Upgrades and Retirement, was revised and reformatted to add new requirements for SCBA purchased during the effective periods of the 2000 and 2007 editions of NFPA 1981. In Chapter 5, subsection 5.1.1 was expanded to include selected accessories that could be added to SCBA.

Overall, chapters 5, 6, 7, and 8 were completely reviewed for upgrades and modifications to existing text as necessary, and the annex material was updated and expanded to provide additional advisory information regarding selection, care, and maintenance issues.

The 2008 edition was issued by the NFPA Standards Council with an effective date of December 31, 2007.

The 2013 edition of NFPA 1852 was completely reviewed for updates and changes to the existing text. The committee processed several proposals and comments, most notably changing the term hazards in Section 4.2 to adverse conditions. Several annex items were updated to reflect changes in U.S. Department of Transportation terminology, including a replacement of the term exemptions with special permits. Also, in Annex C, the committee replaced the name of the Research and Special Programs Administration (RSPA) with its current name, Pipeline and Hazardous Material Safety Administration (PHMSA).

The 2019 edition of NFPA 1852 features editorial updates and changes to the 2013 text. Since NFPA 1852 is now the selection, care, and maintenance standard for NFPA 1986 as well as NFPA 1981, references to NFPA 1986 have been added to sections of the standard. New requirements for reporting adverse conditions involving SCBA have been added, including removal from service, securing SCBA and restricting access, and documenting the chain of custody. A chain of custody form has been added to an annex as an example for users of this standard. NFPA 1986 now requires organizations to provide to the SCBA manufacturer data logging and photo or video evidence of the specific adverse condition. The 2019 edition also clarifies when SCBAs must be upgraded or retired.

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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.

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Committee Scope: This Committee shall have primary responsibility for documents on respiratory equipment, including breathing air, for fire and emergency services personnel

during incidents involving hazardous or oxygen deficient atmospheres. This Committee shall also have primary responsibility for documents on the selection, care, and maintenance of respiratory protection equipment and systems by fire and emergency services organizations and personnel.

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NFPA 1852

Standard on

Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)

2019 Edition

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

Chapter 1 Administration

1.1 Scope.

- ▲ 1.1.1* This standard shall specify minimum requirements for the selection, care, and maintenance of open-circuit self-contained breathing apparatus (SCBA) and combination SCBA/supplied air respirator (SAR) that are used for respiratory protection during emergency or tactical or technical operations, in environments where the atmosphere is immediately dangerous to life and health (IDLH) or could become oxygen deficient or IDLH.

1.1.2 This standard shall specify the requirements for SCBA models as detailed in Section 1.3 of this chapter.

- ▲ 1.1.3 For fire departments, this standard shall specify the requirements for the SCBA selection, care, and maintenance component of the respiratory protection program required in Section 7.10 of NFPA 1500.

1.1.4 This standard shall not specify requirements for any closed-circuit SCBA.

1.1.5 This standard shall not specify requirements for other respiratory protection program components of the organization such as SCBA training, appropriate use of SCBA for operations, and breathing air quality as these program components are under the jurisdiction of other NFPA standards.

1.1.6 This standard shall not specify requirements for accessories attached to the SCBA unless specifically addressed herein.

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

1.2 Purpose.

1.2.1 The purpose of this standard shall be to establish procedures as part of a program to provide care and maintenance for open-circuit SCBA and combination SCBA/SAR in order to reduce the safety risks and potential health risks associated with poorly maintained, contaminated, or damaged SCBA.

- ▲ 1.2.2 This standard shall also establish basic criteria for the evaluation and selection process associated with purchasing open-circuit SCBA to assure only SCBA that meet the requirements of NFPA 1981 or NFPA 1986 are acquired for use by emergency services organizations.

1.3 Application.

1.3.1 New and Existing SCBA.

- ▲ 1.3.1.1 For fire departments, this standard shall apply to the requirements for selection, care, and maintenance of the SCBA component of the fire department's respiratory protection program as required by Section 7.10 of NFPA 1500.

1.3.1.2 This standard shall apply to the acquisition of new open-circuit SCBA and to the preparation of new SCBA to go into the “in service” status.

- ▲ 1.3.1.3 This standard shall apply to the organization's existing open-circuit SCBA that are covered in the care and maintenance part of the respiratory protection program for open-circuit SCBA, and the standard shall also apply to the selection process to acquire new open-circuit SCBA to augment or replace existing SCBA.

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- ▲ 1.3.1.4 This standard shall apply to open-circuit SCBA that were certified by an independent third-party certification organization as compliant with the 2002 or 2007 edition of NFPA 1981, with the 2013 or later edition of NFPA 1981, or with the 2017 edition of NFPA 1986.

1.3.2 Implementation.

1.3.2.1 When this standard is adopted by an organization or by a jurisdiction, the authority having jurisdiction shall set a date or dates for achieving compliance with the requirements of this standard.

1.3.2.2 The organization or the jurisdiction shall be permitted to establish a phase-in schedule for compliance with specific requirements of this standard.

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 19B, *Standard on Respiratory Protective Equipment for Firefighters*, 1971 edition.

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

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2016 edition.

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

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2013 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2007 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, 2002 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 2018 edition.

NFPA 1986, *Standard on Respiratory Protection Equipment for Tactical and Technical Operations*, 2017 edition.

NFPA 1989, *Standard on Breathing Air Quality for Emergency Services Respiratory Protection*, 2019 edition.

2.3 Other Publications.

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

Title 29, Code of Federal Regulations, Part 1910.134, *Respiratory Protection*, 7 August 2012.

Title 29, Code of Federal Regulations, Part 1910.156, *Fire Brigades*, 12 December 2008.

2.3.2 Other Publications.

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 Shall. Indicates a mandatory requirement.

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

3.2.5 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 Atmosphere-Supplying Respirator. A respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, which includes self-contained breathing apparatus (SCBA) and supplied air respirators (SAR). [See also 3.3.14, *Self-Contained Breathing Apparatus (SCBA)*, and 3.3.16, *Supplied Air Respirator (SAR)*.]

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

3.3.3* Combination SCBA/SAR. An atmosphere-supplying respirator that supplies a respirable atmosphere to the user from a combination of two breathing air sources both of which are independent of the ambient environment. [See also 3.3.1, *Atmosphere-Supplying Respirator*; 3.3.14, *Self-Contained Breathing Apparatus (SCBA)*; and 3.3.16, *Supplied Air Respirator (SAR)*.]

3.3.4 Contamination/Contaminated. The process by which protective clothing or equipment has been exposed to hazardous materials or biological agents.

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

3.3.6 Fully Charged. An SCBA cylinder filled to greater than 90 percent of the NIOSH rated service pressure.

3.3.7 In-Service. Ready for immediate use.

3.3.8 Maintenance. Procedures for inspection, repair, and removal from service of protective clothing and equipment.

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

3.3.10 Rebuild. To clean and examine compliant product thoroughly and make needed repairs and replace components as specified by the manufacturer.

3.3.11 SAR. An abbreviation for supplied air respirator. [See also 3.3.16, *Supplied Air Respirator (SAR)*.]

3.3.12 SCBA. An abbreviation for self-contained breathing apparatus. [See also 3.3.14, *Self-Contained Breathing Apparatus (SCBA)*.]

3.3.13 Selection. The process of determining what protective clothing and equipment (PCE) are necessary for protection of 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.

3.3.14* Self-Contained Breathing Apparatus (SCBA). An atmosphere-supplying respirator that supplies a respirable atmosphere to the user from a breathing air source that is independent of the ambient environment and designed to be carried by the user. [See also 3.3.1, *Atmosphere-Supplying Respirator*; 3.3.3, *Combination SCBA/SAR*; and 3.3.16, *Supplied Air Respirator (SAR)*.]

3.3.15 Specified Service Life. Time, exposure event, or number of uses to which a compliant product or component is expected to remain functional.

3.3.16* Supplied Air Respirator (SAR). An atmosphere-supplying respirator, also known as an airline respirator, for which the source of breathing air is not designed to be carried by the user. [See also 3.3.1, *Atmosphere-Supplying Respirator*; 3.3.3, *Combination SCBA/SAR*; and 3.3.14, *Self-Contained Breathing Apparatus (SCBA)*.]

3.3.17 Technician. An individual qualified and authorized by the compliant product manufacturer to provide specified care and maintenance to the product and perform inspection, repair, and testing beyond the level classified as “user repair.”

Chapter 4 Program Component

4.1 General.

4.1.1 Emergency services organizations shall have a written respiratory protection program that addresses the respiratory protection for the members of that organization.

4.1.1.1 As part of the organization’s respiratory protection program, the organization shall develop, implement, and apply a program component for the selection, care, and maintenance of open-circuit SCBA used for respiratory protection by the members of the organization.

▲ **4.1.1.2** For fire departments’ respiratory protection programs specified in Section 7.10 of NFPA 1500 the organization shall develop, implement, and apply the program component for the selection, care, and maintenance of open-circuit SCBA used by the members of the organization in the performance of their assigned functions.

4.1.2 The program component shall have the following goals:

- (1) Provide SCBA that is suitable and appropriate for the intended use
- (2) Maintain SCBA in a safe, usable condition to provide the intended protection to the user
- (3) Remove from use any SCBA that could cause or contribute to user injury, illness, or death because of its condition
- (4) Recondition, repair, or retire such SCBA

4.1.3 The SCBA selection, care, and maintenance component of the organization’s respiratory protection program shall be in accordance with Section 4.3 of this chapter.

4.2 Reporting Adverse Conditions Involving SCBA.

4.2.1 As part of the respiratory protection program, the organization shall develop standard operating procedures (SOPs) for a condition or conditions involving SCBA or SCBA compo-

nents that lead(s) to failure, near-failure, or a significant degradation of performance as a result of normal use.

■ **4.2.2*** The SOP specified in 4.2.1 shall include, but not be limited to, the following:

- (1) Removal from service of the complete SCBA assembly, including the cylinder and facepiece
- (2) Securing of the SCBA and restricting access
- (3) Documentation of the chain of custody

▲ **4.2.3** Where a specific condition as specified in 4.2.1 is identified, the organization shall promptly notify the manufacturer in writing of the specific condition(s) or cause and the circumstances involved with the specific condition(s) or cause.

■ **4.2.3.1** The organization shall provide to the manufacturer data logging and photographic and/or video evidence of the specific condition as specified in 4.2.1.

■ **4.2.3.2** The procedure for notifying the manufacturer in writing shall be identified in the organization’s SOPs.

4.2.4 Copies of the notification to the SCBA manufacturer shall also be promptly supplied to the certification organization that certified the SCBA and to National Institute for Occupational Safety and Health National Personal Protective Technology Laboratory (NIOSH NPPTL).

4.3 SCBA Selection, Care, and Maintenance Program Component.

4.3.1 The organization shall develop written SOPs that shall identify and define the various parts of the organization’s respiratory protection program and the various roles and responsibilities of the organization and the members.

• **4.3.2** As part of the respiratory protection program, the organization shall develop SOPs for minimizing exposure to contaminated SCBA.

4.3.2.1 The organization shall define what criteria determine when an SCBA is contaminated beyond the ability to remedy by cleaning and disinfecting in accordance with Section 6.1 of this standard.

4.3.2.2 The SOPs shall detail methods for proper disposal of such contaminated SCBA in accordance with 4.7.2.

4.3.2.3 As a minimum, SCBA that are known to be contaminated or are suspected of being contaminated shall be tagged out-of-service and shall be segregated from other equipment, personnel, and civilians.

4.3.2.4 The organization shall develop procedures to minimize the public’s risk of exposure to soiled or contaminated SCBA.

4.3.3 The portion of the respiratory protection program for selection of SCBA shall include the requirements specified in Chapter 5 of this standard.

4.3.4 The portion of the respiratory protection program for care of SCBA shall include the requirements specified in Chapter 6 of this standard.

4.3.5 The portion of the respiratory protection program for maintenance of SCBA shall include the requirements specified in Chapter 7 of this standard.

4.3.5.1 As part of the respiratory protection program for maintenance, the organization shall have written SCBA testing

procedures utilizing a breathing machine that meets the requirements of 7.5.5 and 7.5.6.

4.3.5.2 As part of the respiratory protection program for maintenance, the SCBA testing procedures shall include but not be limited to the following:

- (1) Administration
- (2) Testing protocol
- (3) Training in use of the breathing machine
- (4) Calibration of the breathing machine
- (5) Test technician authorization
- (6) Record keeping
- (7) Test scheduling
- (8) Evaluation of the effectiveness of the program

4.3.5.3 As part of the respiratory protection program for maintenance, the organization shall develop SOPs for the frequency of technician inspection and testing of SCBA.

4.3.5.3.1 In all cases, the frequency of technician inspection shall not be less than specified in the SCBA manufacturer's instructions.

4.3.5.3.2 The organization shall also consider factors including but not limited to the following:

- (1) Specific manufacturer's instructions related to breathing machine testing
- (2) Severity of environment in which SCBA is used
- (3) Number of uses for each SCBA
- (4) User reports of visual damage of SCBA
- (5) User complaints of improperly functioning SCBA
- (6) Specific worksite issues
- (7)* Specific SCBA cylinder inspection

4.3.5.4 Where the part of the respiratory protection program that addresses the maintenance of SCBA includes SCBA technicians who are members of the organization, such technicians shall meet the requirements of Section 4.9 of this chapter.

4.3.6* The organization shall develop an SOP that requires that no member of the organization performs any alterations to the SCBA's form, fit, or function that causes the certification to the National Institute for Occupational Health and Safety (NIOSH) or to NFPA 1981 or NFPA 1986 to be invalid.

4.3.7 The organization shall require that all members who use SCBA or are responsible for any part of the organization's respiratory protection program are informed and trained not to make any alterations or changes to any SCBA's original condition that causes the NIOSH certification of the respirators or the certification of the SCBA in accordance with NFPA 1981 or NFPA 1986 to be invalid.

4.4 SCBA Compliance — Upgrades and Retirement.

Δ 4.4.1 SCBA that are currently in service shall be certified as compliant with at least one of the following standards:

- (1) NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, 2002 edition
- (2) NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2007 edition
- (3) NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2013 edition
- (4) NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2018 edition
- (5) NFPA 1986, *Standard on Respiratory Protection Equipment for Tactical and Technical Operations*, 2017 edition.

Δ 4.4.2 SCBA certified to the 2007 and 2013 editions of NFPA 1981 shall be permitted to be upgraded to be compliant with the 2018 edition of NFPA 1981 in accordance with the SCBA manufacturer's and certification organization's instructions.

Δ 4.4.3 Where currently-in-service SCBAs do not meet the requirements of 4.4.1, such SCBAs shall be retired and disposed of as specified in 4.7.1.

4.5 Records.

4.5.1* The organization shall create a written procedure to manage the record-keeping system.

4.5.2 The record-keeping system shall accommodate the documents listed in 4.5.8 and all additional documents that are needed after considering the following factors:

- (1) Need for the record, report, or document
- (2) How the record, report, or document contributes to realizing the organization's goals within the selection, care, and maintenance program component
- (3) Number of copies needed
- (4) Person(s) responsible for producing the record, report, or document
- (5) Format and substance of the record, report, or document
- (6) Person(s) who receives, forwards, reviews, processes, and uses the record, report, or document
- (7)* Disposition of the record, report, or document after it has been completely developed

4.5.3* The organization shall consult with legal counsel concerning specific laws that determine the length of time records, reports, and documents shall be retained. Legal counsel shall advise the organization about the form, written or electronic, that is permitted and under what circumstances original or copied documents are needed for various purposes.

4.5.4 The organization shall determine how required records, reports, and documents are created, processed, maintained, and stored. Regardless of the method selected, the organization shall take measures to prevent loss and damage.

4.5.5 The record-keeping system shall be managed by a person who is trained and qualified to ensure that information is obtained, collected, communicated, retrieved, used, and stored according to the plan. The record-keeping manager shall also consider how to reduce waste, redundancy, and cost in the system.

4.5.6 The manager of the record-keeping system shall educate and train personnel within the organization in completing, filing, and using various components of the record-keeping system. The manager shall be assisted by sufficient staff to fulfill the manager's duties.

4.5.7 The manager of the record-keeping system shall conduct an annual inventory and audit of records, reports, and documents. Following the inventory and audit, the manager shall recommend changes in the record-keeping system as needed.

4.5.8 The organization shall create, maintain, and disseminate the following as required:

- (1) Written instructions for care, maintenance, and repair that correspond to those provided by the manufacturer
- (2) Written instructions for checks while donning SCBA
- (3) Written instructions for inspection, including procedures to be followed if defects are found

- (4) Forms to document the findings during inspection
- (5) Forms to record and to report defects found during inspections and to track the SCBA or cylinder as it is repaired
- (6) Forms to document inspections, tests, and repairs by SCBA users and technicians that shall include the following:
 - (a) SCBA make, model, and serial number and other information to identify components
 - (b) Documentation of the date, result of the inspection or test, and all actions taken as well as who acted
- (7) Written instructions for filling and for testing cylinders
- (8) Written policy and procedure concerning training and authorization of SCBA technicians as well as documentation of that training and authorization
- (9) Written procedures for the inspection of cylinders by technicians
- (10) Written procedures for recording information about the inspection and repair of cylinders
- (11) Stickers, tags, or other similarly effective means to alert users and technicians to defects, to document inspections, and to certify that tests, repairs, and other actions have been completed
- (12) Written procedures for periodic tests and comprehensive inspections that comply with the requirements of this standard
- (13) Documentation of the tests to verify SCBA performance
- (14) Schedule for retention, disposition, and disposal of each report, record, and document
- (15) Methods of identifying all SCBAs, cylinders, parts, and components so that these can be identified and tracked from initial receipt by the organization until removed from the possession and control of the organization
- (16) Documentation when a defective or obsolete SCBA or component part is removed from service in accordance with the following:
 - (a) Until retirement and disposal of a defective or obsolete SCBA or component as specified in 4.7.3, a tag shall be conspicuously placed on the SCBA or component.
 - (b) The tag shall indicate the date and time the SCBA or component was removed from service, by whom, and for what reason.
 - (c) SCBA and components that are removed from service shall be stored separately from other SCBA and components and secured, as necessary.
 - (d) Access to tagged SCBA and components shall be limited, and only authorized persons shall remove tags after repair or service.
- (17) Records for maintenance of each individual SCBA regulator, reducer, harness, cylinder including valve assembly, and facepiece including the following information:
 - (a) Manufacturer's serial number or other unique identifier
 - (b) Date of manufacture, receipt, service, inspection, test, maintenance, and repair
 - (c) Inspections, service, repairs, and tests
 - (d) Who performed the work
 - (e) Other comments
- (18) Records of training provided to each user showing date(s) and subject(s) covered
- (19) Such other reports, records, and documents including forms, tags, stickers, and other means necessary to effectuate the purposes of record keeping and the intent of this standard

4.6 **Manufacturer's Instructions.**

4.6.1 When issuing new SCBA, the organization shall provide users with the instructions provided by the manufacturer on the care, use, and maintenance of their SCBA, including any warnings provided by the manufacturer.

4.6.2 Where the SCBA **manufacturer's** instructions regarding the SCBA's care, use, and maintenance differ from the requirements in this standard other than the requirements specified in 7.2.1.3 and 7.5.1, the manufacturer's instructions shall be followed.

4.7 **Retirement and Disposal.**

4.7.1 Retired SCBA shall be destroyed or altered in a manner assuring that they are not used for respiratory protection and shall be rendered unable to hold pressure, or the ownership of the SCBA shall be transferred to the manufacturer or the manufacturer's agent.

4.7.2 Where SCBA or SCBA components are contaminated beyond the ability to be decontaminated so the SCBA or components can be returned to service, such SCBA or component shall be disposed of.

4.7.2.1 Contaminated SCBA or components as identified according to 4.7.2 shall be segregated from other equipment and personnel and disposed of in a manner consistent with the type of contamination and any governmental regulations governing contaminated items.

4.7.2.2 Prior to disposal, contaminated SCBA or components shall be altered in a manner assuring that they cannot be used for any purpose.

4.7.3 Defective or obsolete SCBA components or defective or obsolete SCBA that have been removed from service and cannot be repaired or upgraded shall be destroyed or altered in a manner assuring that they cannot be used in any emergency, **tactical or technical operations**, or other activities, including training; or the ownership of such SCBA shall be transferred to the manufacturer or the **manufacturer's** agent.

4.7.4 SCBA elastomeric components, including but not limited to facepieces, O-rings, and hose, shall be destroyed or altered in a manner assuring that they cannot be used for any purpose when the component reaches the SCBA manufacturer's specified component service life.

4.7.5* SCBA composite cylinders shall be removed from service and retired when they reach the end of the service life specified by the SCBA manufacturer. Such composite cylinders shall be destroyed or altered in a manner assuring that they cannot be used for respiratory protection and shall be rendered unable to hold pressure, or the ownership of the composite cylinder shall be transferred to the manufacturer or the **manufacturer's** agent.

4.7.6 Any SCBA cylinders that are beyond repair or not allowed to be repaired shall be destroyed or altered in a manner assuring that they are marked and identified as “Condemned” and shall be rendered unable to hold pressure. Before destroying or rendering them unable to hold pressure, permission from the owner of the cylinder shall be obtained.

4.8 Quality Assurance.

4.8.1 The organization shall establish and maintain a quality assurance plan for selection, care, and maintenance of SCBA.

4.8.2 The quality assurance plan shall be designed to realize all of the following goals:

- (1) Assure effective and safe performance of SCBA provided to users
- (2) Substantiate compliance with this standard
- (3) Confirm the organization's policies and procedures are being followed
- (4) Determine the effectiveness of those policies and procedures
- (5) Improve the organization's respiratory protection program component for selection, care, and maintenance of SCBA

4.9 Technical Authorization.

4.9.1 Where the portion of the respiratory protection program component that addresses the maintenance of SCBA, as specified in 4.3.5, includes SCBA technicians that are members of the organization, such technicians shall be qualified and authorized by the SCBA manufacturer to perform specified allowable maintenance.

4.9.1.1 Allowable maintenance shall include periodic inspection, repair, and overhaul of all SCBA components and assemblies.

4.9.1.2 Technicians shall also be qualified and authorized in the use of all special tools and equipment required to test and maintain the SCBA.

4.9.2 The program component shall establish policies and procedures for qualification and selection of personnel for SCBA technician training and authorization.

4.9.3 The organization shall maintain evidence that all SCBA technicians that are used by the organization have current authorization by the SCBA manufacturer and have maintained their level of competency.

Chapter 5 Selection

5.1 Selection for Purchase.

5.1.1 Risk Assessment.

5.1.1.1 Prior to starting the procurement process of SCBA, a risk assessment shall be performed.

5.1.1.2 The risk assessment shall include, but not be limited to, the expected hazards that can be encountered by users of SCBA based on the type of duties performed, frequency of use, the organization's experiences, and the organization's geographic location and climatic conditions.

5.1.2 The organization shall review the following standards as a minimum:

- (1) NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*
- (2) NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, where SCBA-integrated PASS are being considered as an accessory for the SCBA
- (3) NFPA 1986, *Standard on Respiratory Protection Equipment for Tactical and Technical Operations*

5.1.2.1 Fire department organizations shall also review NFPA 1500 and 29 CFR 1910.156.

5.1.2.2 Organizations in the United States shall also review 29 CFR 1910.134.

5.1.2.3 Organizations outside the United States shall also review all applicable national, state/provincial, and local regulations.

5.1.3 The organization shall compile and evaluate information on comparative product strengths and weaknesses.

5.1.4 The organization shall ensure that the SCBA interfaces properly with other personal protective items already being used by the organization.

5.1.5 The organization shall consider at least the following items during the selection process:

- (1) Cross contamination between users and ease of cleaning/decontamination
- (2) Legibility of remote pressure indicators in reduced visibility
- (3) Size
- (4) Weight
- (5) Rated service time
- (6) Breathing resistance
- (7) Environment
- (8) Ease of donning and doffing
- (9) Comfort
- (10) Fit range and available number of facepiece sizes
- (11) Number and complexity of steps involved in operation and maintenance of the SCBA
- (12) Design features that provide positive feedback to the user that required steps have been completed properly
- (13) Design features that prevent steps from being performed improperly
- (14) Operability by user wearing the protective clothing and gloves worn when using SCBA
- (15) Facepiece vision area
- (16) Cylinder fill station requirements
- (17)* Method for uniquely identifying the components of the SCBA
- (18)* Facepiece nose cup
- (19) Vision correction needs of their personnel
- (20) Characteristics of the end-of-service time indicators (EOSTIs)
- (21) Communication capability including, but not limited to, speech diaphragms, voice amplifiers, and radio interface
- (22) Supplied air compatibility
- (23) Number of spare SCBA and cylinders
- (24) Rapid cylinder filling options

- (25) Cylinder types
- (26) Chemical, biological, radiological, and nuclear (CBRN) respiratory protection
- (27) SCBA accessories as follows:
 - (a) Telemetry and monitoring systems
 - (b) Personnel location systems
 - (c) SCBA-integrated PASS
 - (d) Emergency egress escape systems for bailout
 - (e) Emergency breathing safety system (EBSS)
- (28) Data log information and ease of retrieval
- (29) Battery life
- (30) Integration with command, accountability, and air management systems
- (31) Interface with certified CBRN ensembles
- (32) Interface with transportation seating
- (33) Interface with storage mechanisms
- (34) Interface or certification with fall protection harness
- (35) Interface or certification with escape or rappelling devices
- (36) Profile passing through openings
- (37) Interface with structural fire-fighting protective hood interface component providing particulate protection

N 5.1.5.1 For SCBA certified to NFPA 1986, the organization shall consider the following items:

- (1) Interface and mobility with weapons
- (2) Interface with body armor and non-fire-fighting helmets
- (3) Interface with other tools and equipment not used in fire-fighting operations
- (4) Interface with cooling systems

5.1.6 Where a field or laboratory evaluation is conducted, at least the following criteria shall be used for designing a systematic evaluation procedure:

- (1) The organization shall develop an evaluation plan including, but not limited to, testing according to 7.5.2 prior to and after field evaluations.
- (2) Participants for field evaluations shall be selected based on a cross-section of personnel, willingness to participate, objectivity, and level of operational activity.
- (3) Participants shall perform a field evaluation on each different product model being considered from each manufacturer for a particular SCBA. Participants shall be fitted for and instructed in the use of each product model being evaluated from each manufacturer.
- (4) A product evaluation form shall be developed for each model.
- (5) The organization shall solicit periodic reports from participants in the field evaluation.
- (6) The organization shall conclude the evaluation process and analyze the results.

5.1.7 Purchase specifications shall require evidence that the SCBA to be purchased are certified as compliant with NFPA 1981 or NFPA 1986, as appropriate.

Δ 5.1.7.1 Where SCBA-integrated PASS are installed as an accessory to the SCBA, the SCBA-integrated PASS shall be certified as compliant with NFPA 1982.

Δ 5.1.7.2 For each standard, NFPA 1981, NFPA 1982, or NFPA 1986, the edition of the respective standard(s) that is the current edition at the time of purchase shall be the edition specified.

5.1.8 Where the organization develops purchase specifications, at least the following criteria shall be considered:

- (1) All requirements developed by the organization in its evaluations conducted as specified in 5.1.3 through 5.1.7
- (2)* Quantitative fit testing
- (3) User training
- (4) Maintenance training
- (5) Manufacturer assistance to develop SOPs for maintenance
- (6) SCBA testing on site prior to acceptance
- (7) Maintenance schedule
- (8) Complete parts list
- (9) SCBA user and service manuals
- (10) List of any specialized equipment or special tools needed for SCBA maintenance
- (11) List of authorized service centers
- (12) Warranty statement
- (13) Need for an optional EBSS
- (14) Need for an optional supplementary voice communications system
- (15) Procedures for returning items found defective upon initial receipt

N 5.1.8.1 Where the organization develops purchase specifications for SCBA certified to NFPA 1986, at least the following criteria shall be considered:

- (1) Need for an optional HUD
- (2) Need for an optional RIC UAC

5.2 Acceptance.

5.2.1 Upon receipt, organizations shall inspect and test purchased SCBA in accordance with 7.1.2, and 7.5.2 through 7.5.6, respectively.

5.2.2 Organizations shall verify that the equipment received is as specified.

5.2.3 Procedures shall be established for returning unsatisfactory products if the organization's specifications are not met.

5.2.4 Organizations shall review information supplied with the products such as instructions, warranties, and technical data.

Chapter 6 Care

6.1 Cleaning and Disinfecting.

6.1.1 The external surfaces of the SCBA shall be cleaned and disinfected according to the manufacturer's instructions using only those agents indicated by the manufacturer.

6.1.2 The facepiece shall be thoroughly cleaned after each use and disinfected as needed. Facepiece cleaning and disinfecting shall be performed according to the manufacturer's instructions using only those agents indicated by the manufacturer.

6.1.2.1 The exhalation valve shall be cleaned and flushed.

6.1.2.2 The facepiece shall be dried, and drying shall not be done in direct sunlight or in high heat.

6.1.2.3 The exhalation valve shall be cycled to assure proper operation.

6.1.3 Where the internal components have been exposed to bodily fluids, exhaled breath, dirt, or debris, the second stage regulator shall be thoroughly cleaned and disinfected. The cleaning and disinfecting shall be performed according to the manufacturer's instructions using only those agents indicated by the manufacturer.

6.1.4 SCBA straps and harness assemblies shall be cleaned and disinfected when required according to manufacturer's instructions. Straps and harness assembly cleaning and disinfecting shall be performed according to the manufacturer's instructions using only those agents indicated by the manufacturer.

6.1.4.1* Under no circumstances shall a chlorine bleach ever be used to clean straps and harness assemblies.

6.1.4.2 The straps and harness assemblies shall be dried, and drying shall not be done in direct sunlight or in high heat.

6.1.5 SCBA cylinder valve assemblies shall be cleaned and disinfected according to the manufacturer's instructions using only those agents indicated by the manufacturer.

6.1.5.1 The valve shall be free of debris.

6.1.5.2 The burst disc outlet shall be inspected and, if debris is present, the cylinder shall be removed from service.

6.1.6* Water or cleaning materials shall be prevented from entering the connection between the cylinder valve and the mating SCBA inlet connector.

6.1.7 Pneumatic component cleaning and disinfecting shall be performed according to the manufacturer's instructions using only those agents indicated by the manufacturer.

6.1.7.1 All pneumatic components shall be thoroughly dried after cleaning.

6.1.7.2 Drying of pneumatic components shall not be done in direct sunlight or in high heat.

6.1.8 All other SCBA components shall be thoroughly air-dried prior to storage in a compartment that does not allow for air circulation.

6.1.9 Appropriate inspections according to 7.1.2 shall be performed after cleaning.

6.2 Contamination and Decontamination.

6.2.1 Where SCBA is suspected of being contaminated, it shall be tagged out-of-service and segregated from other equipment and personnel.

6.2.2 Tags shall include details of the incident including known and suspected contaminants.

6.2.3 The SCBA manufacturer shall be contacted to determine if any additional special procedures can be used to decontaminate the SCBA.

6.2.4 In all cases, decontamination shall be conducted in accordance with the SCBA manufacturer's instructions.

6.2.5 Where it is determined, in accordance with 4.3.2.1, that the SCBA is contaminated beyond the ability to decontaminate it and return it to service, the SCBA shall be disposed of in accordance with 4.7.2.

6.3 Storage.

6.3.1 SCBA shall be stored in their original carrying or storage cases or in a wall or apparatus bracket/rack designed for quick removal and for protection of the SCBA. Brackets/racks shall protect the SCBA and shall be adjusted so they do not cause physical damage to cylinders, hoses, regulators, or straps.

Δ 6.3.2 Brackets for securing SCBA in vehicles used for transportation of emergency services personnel shall meet the requirements of 14.1.10 of NFPA 1901.

6.3.3 SCBA shall be stored with the cylinder valves closed. Other valves or controls shall be positioned according to manufacturer's specifications.

6.3.4 The facepieces of all SCBA shall be positioned to avoid distortion of parts during storage.

6.3.5 All harness straps shall be adjusted to their maximum length during storage.

6.3.6 In all instances, the SCBA shall be stored in a manner to control and minimize exposure to shock, vibration, sunlight, heat, extreme cold, excessive moisture, damaging chemicals, and environmental elements.

6.3.7* All in-service SCBA cylinders shall be stored fully charged.

6.3.7.1 Cylinders shall be filled when the pressure falls to 90 percent of the manufacturer's specified pressure level.

6.3.7.2 A positive pressure shall be maintained in depleted SCBA cylinders by keeping the valve closed until they are filled to keep external contamination and condensation out of the cylinder.

6.3.7.3* Compressed breathing air stored in SCBA breathing air cylinders shall be replaced at least annually.

6.3.8 SCBA cylinders shall be stored in a manner that prevents damage to the valve and cylinder.

Chapter 7 Maintenance

7.1 User Maintenance.

7.1.1 Inspection Frequency.

7.1.1.1* Where SCBA is assigned to an individual user for a duty period, the inspection specified in 7.1.2 shall be performed by the individual user at the beginning of each duty period.

7.1.1.2 Where additional SCBA are available for use on response vehicles but not assigned to individual users, the inspection specified in 7.1.2 shall be performed on such additional SCBA at least once each duty period.

7.1.1.3 Where SCBA are not assigned to an individual user for a duty period, the inspection specified in 7.1.2 shall be performed at least once a week on all SCBA that are available for use.

7.1.1.4 In all cases, the interval between the inspections specified in 7.1.2 shall not exceed 1 week.

7.1.2 Inspection.

7.1.2.1 All of the following SCBA components shall be present:

- (1) Facepiece
- (2) Backframe and harness assembly
- (3) Cylinder
- (4) Hose
- (5) End-of-service-time indicator(s) (EOSTI)
- (6) Regulators
- (7) Accessories

7.1.2.2 Facepiece inspection shall include the following:

- (1) Material checked for deterioration, dirt, cracks, tears, holes, pliability, and tackiness
- (2) Head-harness buckles, strap, and webbing checked for breaks, loss of elasticity, or wear
- (3) Lens checked for holes, cracks, scratches, heat-damaged areas, and a proper seal with the facepiece material
- (4) Exhalation valve, where present, checked for valve seat
- (5) Springs and covers checked for proper operation and cleanliness
- (6) Regulator connection(s) checked for proper operation and damage
- (7) Speaking diaphragm, where present, checked for damage

7.1.2.3 Backframe and harness assembly inspection shall include the following:

- (1) Harness straps and backframe checked for cuts, tears, abrasion, indications of heat damage, and indications of chemical-related damage
- (2) All buckles, fasteners, and adjustments checked for proper operation
- (3) Cylinder retention system checked for damage and proper operation
- (4) Cylinder checked for secure attachment to the backframe
- (5) Harness straps checked for full extension

7.1.2.4 Breathing air cylinder assembly inspection shall include the following:

- (1) Hydrostatic test date on the cylinder checked to be current
- (2) Gauge checked for damage
- (3) Cylinder body checked for cracks, dents, weakened areas, indications of heat damage, and indications of chemical damage (*See Annex B*)
- (4) Composite portion of the cylinder checked for cuts, gouges, loose composite materials, and the absence of resin (*See Annex B*)
- (5) Cylinder valve outlet sealing surface and threads checked for damage
- (6) Valve hand wheel checked for damage, proper alignment, serviceability, and secure attachment
- (7) Burst disc outlet area checked for debris
- (8) Cylinder checked for full charge

7.1.2.5 Hose inspection shall include the following:

- (1) Hose checked for cuts, abrasions, bubbling, cracks, heat damage, and chemical damage
- (2) External fittings checked for visual signs of damage
- (3) Hose checked for tight connections

7.1.2.6 EOSTI inspection shall include the following:

- (1) EOSTI alarm and mounting hardware checked for damage, secure attachment, dirt, and debris

- (2) EOSTI checked for proper activation in accordance with the manufacturer's instructions

7.1.2.7 Regulator inspection shall include the following:

- (1) Regulator controls, where present, checked for damage and proper function
- (2) Pressure relief devices checked visually for damage
- (3) Housing and components checked for damage
- (4) Regulator checked for any unusual sounds such as whistling, chattering, clicking, or rattling during operation
- (5) Regulator and bypass checked for proper function when each is operated (Where this is accomplished by donning the facepiece and contamination between users is a possibility, the regulator, facepiece, or both shall be cleaned and disinfected.)

7.1.2.8 Pressure indicator inspection shall include the following:

- (1) Pressure indicator checked for damage
- (2) Cylinder pressure gauge and the remote gauge checked to read within 10 percent of each other

7.1.2.9 Where SCBA has an integrated PASS, the SCBA-integrated PASS inspection shall include the following:

- (1) Wear and damage assessment
- (2) Covers/compartments checked for secure attachment
- (3) All operating modes checked for proper function
- (4) Low battery warning signal

7.1.2.10 Where SCBA has other required or optional components, such components shall be inspected in accordance with the manufacturers' instructions and shall include at least inspection for signs of complete assembly of the component, wear, damage, secure attachment, adequate power source, and proper operation and functioning in accordance with the manufacturers' operational instructions.

7.1.2.11 As the final inspection item, the entire SCBA shall be checked for pressure retention by closing all regulator valves, opening the cylinder valve thereby pressurizing the SCBA system, and then closing the cylinder valve.

7.1.2.11.1 The SCBA shall hold system pressure in accordance with the manufacturer's specifications after the cylinder valve is closed.

7.1.2.11.2 Following the pressure check, the system pressure shall be released.

7.1.3 Repair.

7.1.3.1 Where user repair can be accomplished promptly and replacement items or remedial action are immediately available, the SCBA shall be permitted to be restored to proper condition and returned to in-service status.

7.1.3.2 Where user repair cannot be accomplished promptly or where replacement items or remedial action are not immediately available, the SCBA shall be tagged out-of-service and removed from the response vehicle or standby location until the user repair can be completed.

7.1.3.3 The organization's personnel shall follow the organization's SOPs and the manufacturer's written instructions for allowable user repairs and shall be trained on the specific repair procedures before performing them.

7.1.3.4 Users shall not perform work beyond the limits of the organization's SOPs and their training and shall not exceed what is allowed by the manufacturer's written instructions.

7.1.3.5 All repairs shall be done with the proper tools, parts, and equipment as specified by the manufacturer.

7.1.3.6 After repairs are made, the user shall conduct the appropriate inspection as specified in 7.1.2 to verify proper function of the SCBA.

7.1.4 Removal from Service.

7.1.4.1* Where a condition exists that is beyond user repair in accordance with 7.1.3, or the SCBA is suspected to be in an unsafe condition, the SCBA shall be removed from service, tagged, and referred to personnel responsible for technical maintenance.

7.1.4.2 Where any breathing air cylinder condition specified in 7.1.2.4 is identified, the cylinder shall be immediately depressurized to a slight positive pressure, tagged, and taken out of service. The valve shall be closed to keep external contamination and condensation out of the cylinder.

7.1.4.3 Any SCBA or SCBA components that have been exposed or are suspected of having been exposed to a CBRN agent(s) shall be removed from service, tagged, segregated from other equipment and personnel, and referred to person(s) designated in the organization's SOPs for appropriate disposition as specified in Section 4.7.

Δ 7.1.4.4 Any SCBA or SCBA components being taken out of service shall be tagged as specified in 4.5.8(16).

7.1.4.5 Where an SCBA breathing air cylinder is identified as having been filled with air that did not comply with 7.3.2, the cylinder shall be removed from service, tagged, and referred to personnel responsible for technical maintenance.

7.2 Technician Maintenance.

7.2.1 Inspection Frequency.

7.2.1.1 The technician shall perform the inspection specified in 7.1.2 upon receipt of any SCBA removed from service.

7.2.1.2 The technician shall perform the inspection specified in 7.1.2 and the testing specified in Section 7.5 prior to returning any SCBA to service.

7.2.1.3 The SCBA shall be tested on a breathing machine specified in 7.5.6 in accordance with the organization's SOPs or in accordance with the SCBA manufacturer's instructions, whichever is more frequent, but in all cases at least annually.

7.2.1.4 The frequency of technician inspection and testing of SCBA shall be conducted in accordance with the organization's SOPs developed as specified in 4.3.5.3.

7.2.1.5 The organization shall test all newly purchased SCBA as specified in Section 7.5 prior to putting the SCBA in service.

7.2.2 Inspection.

7.2.2.1 Technicians shall perform the level of inspection for which they have been trained and have been qualified to conduct by the SCBA manufacturer.

7.2.2.2 Where an SCBA is removed from service in accordance with 7.1.4, the technician shall verify the user-reported condition.

7.2.2.3 Where the user-reported condition is verified by the technician, the technician then shall determine the appropriate action to be taken to repair, return to service, or retire the SCBA or SCBA component(s).

7.2.2.4 Where the user-reported condition cannot be substantiated, the technician shall perform a complete SCBA inspection in accordance with the manufacturer's instructions.

7.2.3 Repairing and Rebuilding.

7.2.3.1 Technicians shall perform the level of repair or rebuild for which they have been qualified and are authorized to conduct by the SCBA manufacturer.

7.2.3.2 The technician shall verify that all parts and tools used in the maintenance, repair, and rebuild of SCBA are specified by the SCBA manufacturer for the specific SCBA model being repaired.

7.2.3.3* Parts and tools not specified by the manufacturer shall not be used.

7.2.3.4 The technician shall ensure that all components and tools are kept clean and free from contamination during repair and rebuild.

7.2.3.5 The technician shall ensure components are not damaged during repair and rebuild.

7.2.3.6 Product labels shall not be removed or obscured during repair or rebuild. Damaged or missing labels shall be replaced during repair or rebuild.

7.2.3.7 After repair or rebuild, the SCBA or SCBA component shall be inspected and tested in accordance with manufacturer's instructions.

7.2.3.8 Cylinder repairs shall be limited to only those conditions specified by the SCBA manufacturer.

Δ 7.2.3.9* SCBA shall be periodically rebuilt to replace all components that are subject to wear and aging at a frequency specified by the manufacturer or by the organization, whichever is more frequent. Such frequency shall be based on the conditions of use of the SCBA as indicated in 4.5.8(17)(a) through (e).

7.2.4 Removal from Service and Disposition.

7.2.4.1* An SCBA breathing air cylinder identified as having been filled with air that is found to not comply with the breathing air requirements of 7.3.2 shall be removed from service.

7.2.4.1.1 Action shall be taken based on consideration of the reason for the air sample failure.

7.2.4.1.2 Further action shall be taken to ensure that if the breathing air cylinder is placed back in service, that breathing air cylinder does not pass contaminants back to the breathing air in future fillings.

7.2.4.2* Any SCBA or SCBA component that is damaged and cannot be repaired shall be removed from service and retired as specified in Section 4.7.

7.2.4.3* Any SCBA or SCBA components that have been exposed to or are suspected of having been exposed to a CBRN agent(s), and where such exposure cannot be remedied by a decontamination process authorized by the SCBA manufacturer, shall be retired as specified in Section 4.7.

7.2.4.4 Any SCBA breathing air cylinder that is beyond repair shall be removed from service and retired as specified in Section 4.7.

7.2.4.5 Composite breathing air cylinders shall be removed from service and retired as specified in Section 4.7 when they reach the end of the SCBA manufacturer's specified service life.

7.2.4.6* Any elastomeric component, including but not limited to facepieces, O-rings, and hose, shall be removed from service and retired as specified in Section 4.7, when they reach the end of the SCBA manufacturer's specified service life.

7.3 Breathing Air Cylinder Filling.

△ 7.3.1 Prior to filling SCBA breathing air cylinders, the cylinder inspection specified in 7.1.2.4(1) through (8) shall be performed.

△ 7.3.2 Breathing air shall meet the requirements specified in NFPA 1989.

7.3.3 The SCBA manufacturer's specified fill rate shall not be exceeded.

7.3.4 SCBA breathing air cylinders shall be filled as soon as possible after use.

△ 7.3.5* Where filling breathing air cylinders during routine maintenance, all operators and personnel shall be protected from catastrophic failure of the cylinder by the use of an SCBA fill station that meets the requirements specified in Section 24.9 of NFPA 1901.

7.3.6 SCBA breathing air cylinders shall be requalified as specified by the SCBA manufacturer.

7.4 Breathing Air Cylinder Requalification.

7.4.1 SCBA breathing air cylinders shall be periodically requalified for service as required by the U.S. Department of Transportation (DOT). (*See Annex C.*)

7.4.2 Where an SCBA breathing air cylinder is found to not be currently qualified for service, it shall be removed from service, tagged, and submitted for requalification testing.

7.4.3 An SCBA breathing air cylinder that fails requalification shall be dealt with in accordance with 4.7.6.

7.5 Testing.

7.5.1 The organization responsible for the maintenance of the SCBA shall perform periodic testing in accordance with the part of the SCBA program component for maintenance as specified in 4.3.5. In all cases, SCBA shall be tested at least annually on a breathing machine that meets the requirements specified in 7.5.5 and 7.5.6.

△ 7.5.2 SCBA shall be tested for the performance specified in Table 7.5.2 after being inspected as specified in 7.1.2.

7.5.2.1 The sound level of all audible EOSTI shall be measured using a calibrated instrument following the SCBA manufacturer's instructions and specifications.

7.5.2.2 All other EOSTI shall be measured in accordance with the manufacturer's instructions and specifications at least annually.

7.5.2.3 SCBA EOSTI signaling device(s) activation and operation shall conform to the SCBA manufacturer's specifications.

7.5.3 SCBA that fail to meet any of the acceptance criteria provided in Table 7.5.2 shall be tagged out-of-service until that SCBA has been adjusted or repaired, retested, and shown to meet all the requirements of Table 7.5.2.

7.5.4 All equipment used to test SCBA shall be calibrated in accordance with the test equipment manufacturer's instructions for calibration.

7.5.4.1 Calibration shall be performed periodically in accordance with the test equipment manufacturer's instructions but shall be calibrated at least annually.

7.5.4.2 A label shall be affixed to each piece of test equipment stating the date of the latest calibration and the date of the next scheduled calibration.

7.5.4.3 Records of calibration results shall be kept on file at the maintenance facility.

7.5.5 The breathing machine shall be capable of performing the tests listed in Table 7.5.2.

7.5.6 The breathing machine and any associated equipment shall be capable of meeting the specifications in Table 7.5.6(a) and Table 7.5.6(b).

Table 7.5.2 Performance Test Requirements

Performance Element	Acceptance Criteria
Facepiece leakage	In order to proceed with the tests specified in this table, a pressure of at least 0.20 mb (0.1 in.) H ₂ O gauge below atmospheric shall remain in the facepiece at the end of a testing interval equal to 10 seconds ± 0.5 seconds.
Facepiece exhalation valve opening pressure	Facepiece exhalation valve opening pressure shall be within manufacturer's specifications.
Facepiece static pressure	Pressure shall be between 0 mb (0 in.) H ₂ O gauge and 3.7 mb (1½ in.) H ₂ O gauge above atmospheric or shall meet manufacturer's specifications, whichever are more stringent.
First stage regulator (pressure reducer) static pressure	First stage regulator (pressure reducer) static pressure shall be within manufacturer's specifications.
Minimum facepiece pressure during breathing resistance test (at 40 L/min ± 1 L/min)	Minimum facepiece pressure shall meet manufacturer's specifications.
Maximum facepiece pressure during breathing resistance test (at 85 L/min ± 1 L/min)	Maximum facepiece pressure shall be less than or equal to the manufacturer's specifications, but not more than 5.0 mb (2 in.) H ₂ O gauge above maximum static pressure.
Facepiece pressure during breathing resistance test (at 103 L/min ± 3 L/min)	Pressure shall be between 0 mb (0 in.) H ₂ O gauge and 8.7 mb (3½ in.) H ₂ O gauge above atmospheric or shall meet manufacturer's specifications, whichever are more stringent.
First stage pressure during breathing resistance test (at 103 L/min ± 3 L/min)	First stage pressure (pressure reducer) shall be within manufacturer's specifications.
First stage pressure during breathing resistance test (at 40 L/min ± 1.0 L/min)	First stage pressure (pressure reducer) shall be within manufacturer's specifications.
Remote pressure gauge accuracy at ¾, ½, ¼-rated cylinder pressure	Remote pressure gauge accuracy shall be within ±5 percent of full scale.
End-of-service time indicator (EOSTI): Activation	The EOSTI shall activate within manufacturer's specifications. Where the SCBA includes a second EOSTI, the activation pressure of the second EOSTI shall meet manufacturer's specifications.
Bypass flow rate	Where bypass valves are provided on SCBA, the flow rate through the bypass system shall be within manufacturer's specifications.

▲ Table 7.5.6(a) Lung Breathing Waveforms for 103 L/min Volume Work Rate

Step Number	Time (seconds)	Inspire/Expire	Volume (L) ± 0.1 L	Volume Change (L) ± 5%
0	0.00	—	-1.700	-0.012
1	0.02	Inspire	-1.688	0.012
2	0.04	Inspire	-1.662	0.025
3	0.06	Inspire	-1.626	0.036
4	0.08	Inspire	-1.581	0.045
5	0.10	Inspire	-1.529	0.052
6	0.12	Inspire	-1.471	0.058
7	0.14	Inspire	-1.409	0.062
8	0.16	Inspire	-1.345	0.064
9	0.18	Inspire	-1.277	0.068
10	0.20	Inspire	-1.207	0.070
11	0.22	Inspire	-1.134	0.073
12	0.24	Inspire	-1.059	0.075
13	0.26	Inspire	-0.984	0.076
14	0.28	Inspire	-0.906	0.077
15	0.30	Inspire	-0.828	0.079
16	0.32	Inspire	-0.748	0.080
17	0.34	Inspire	-0.667	0.081
18	0.36	Inspire	-0.586	0.081
19	0.38	Inspire	-0.504	0.082
20	0.40	Inspire	-0.421	0.083
21	0.42	Inspire	-0.337	0.084
22	0.44	Inspire	-0.254	0.084
23	0.46	Inspire	-0.169	0.085
24	0.48	Inspire	-0.085	0.085
25	0.50	Inspire	0	0.085
26	0.52	Inspire	0.085	0.085
27	0.54	Inspire	0.169	0.085
28	0.56	Inspire	0.254	0.085
29	0.58	Inspire	0.337	0.084
30	0.60	Inspire	0.421	0.084
31	0.62	Inspire	0.504	0.083
32	0.64	Inspire	0.586	0.082
33	0.66	Inspire	0.667	0.081
34	0.68	Inspire	0.748	0.081
35	0.70	Inspire	0.828	0.080
36	0.72	Inspire	0.906	0.079
37	0.74	Inspire	0.984	0.077
38	0.76	Inspire	1.059	0.076
39	0.78	Inspire	1.134	0.075
40	0.80	Inspire	1.207	0.073
41	0.82	Inspire	1.277	0.070
42	0.84	Inspire	1.345	0.068
43	0.86	Inspire	1.409	0.064
44	0.88	Inspire	1.471	0.062
45	0.90	Inspire	1.529	0.058
46	0.92	Inspire	1.581	0.052
47	0.94	Inspire	1.626	0.045
48	0.96	Inspire	1.662	0.036
49	0.98	Inspire	1.688	0.025
50	1.00	—	1.700	0.012
51	1.02	Expire	1.688	-0.012
52	1.04	Expire	1.662	-0.025
53	1.06	Expire	1.626	-0.036
54	1.08	Expire	1.581	-0.045
55	1.10	Expire	1.529	-0.052
56	1.12	Expire	1.471	-0.058

(continues)

△ Table 7.5.6(a) *Continued*

Step Number	Time (seconds)	Inspire/Expire	Volume (L) ± 0.1 L	Volume Change (L) ± 5%
57	1.14	Expire	1.409	-0.062
58	1.16	Expire	1.345	-0.064
59	1.18	Expire	1.277	-0.068
60	1.20	Expire	1.207	-0.070
61	1.22	Expire	1.134	-0.073
62	1.24	Expire	1.059	-0.075
63	1.26	Expire	0.984	-0.076
64	1.28	Expire	0.906	-0.077
65	1.30	Expire	0.828	-0.079
66	1.32	Expire	0.748	-0.080
67	1.34	Expire	0.667	-0.081
68	1.36	Expire	0.586	-0.081
69	1.38	Expire	0.504	-0.082
70	1.40	Expire	0.421	-0.083
71	1.42	Expire	0.337	-0.084
72	1.44	Expire	0.254	-0.084
73	1.46	Expire	0.169	-0.085
74	1.48	Expire	0.085	-0.085
75	1.50	Expire	0	-0.085
76	1.52	Expire	-0.085	-0.085
77	1.54	Expire	-0.169	-0.085
78	1.56	Expire	-0.254	-0.085
79	1.58	Expire	-0.337	-0.084
80	1.60	Expire	-0.421	-0.084
81	1.62	Expire	-0.504	-0.083
82	1.64	Expire	-0.586	-0.082
83	1.66	Expire	-0.667	-0.081
84	1.68	Expire	-0.748	-0.081
85	1.70	Expire	-0.828	-0.080
86	1.72	Expire	-0.906	-0.079
87	1.74	Expire	-0.984	-0.077
88	1.76	Expire	-1.059	-0.076
89	1.78	Expire	-1.134	-0.075
90	1.80	Expire	-1.207	-0.073
91	1.82	Expire	-1.277	-0.070
92	1.84	Expire	-1.345	-0.068
93	1.86	Expire	-1.409	-0.064
94	1.88	Expire	-1.471	-0.062
95	1.90	Expire	-1.529	-0.058
96	1.92	Expire	-1.581	-0.052
97	1.94	Expire	-1.626	-0.045
98	1.96	Expire	-1.662	-0.036
99	1.98	Expire	-1.688	-0.025

▲ Table 7.5.6(b) Lung Breathing Waveforms for 40 L/min Volume Work Rate

Step Number	Time (seconds)	Inspire/Expire	Volume (L) ± 0.1 L	Volume Change (L) ± 5%
0	0.000	—	-0.833	0.001
1	0.025	Inspire	-0.831	0.002
2	0.050	Inspire	-0.825	0.005
3	0.075	Inspire	-0.816	0.009
4	0.100	Inspire	-0.803	0.013
5	0.125	Inspire	-0.787	0.016
6	0.150	Inspire	-0.768	0.019
7	0.175	Inspire	-0.745	0.022
8	0.200	Inspire	-0.720	0.025
9	0.225	Inspire	-0.692	0.028
10	0.250	Inspire	-0.661	0.031
11	0.275	Inspire	-0.628	0.033
12	0.300	Inspire	-0.592	0.035
13	0.325	Inspire	-0.555	0.038
14	0.350	Inspire	-0.515	0.039
15	0.375	Inspire	-0.474	0.041
16	0.400	Inspire	-0.431	0.043
17	0.425	Inspire	-0.387	0.044
18	0.450	Inspire	-0.341	0.046
19	0.475	Inspire	-0.295	0.047
20	0.500	Inspire	-0.247	0.048
21	0.525	Inspire	-0.198	0.049
22	0.550	Inspire	-0.149	0.049
23	0.575	Inspire	-0.100	0.050
24	0.600	Inspire	-0.050	0.050
25	0.625	Inspire	0	0.050
26	0.650	Inspire	0.051	0.050
27	0.675	Inspire	0.100	0.050
28	0.700	Inspire	0.150	0.050
29	0.725	Inspire	0.199	0.049
30	0.750	Inspire	0.248	0.048
31	0.775	Inspire	0.295	0.048
32	0.800	Inspire	0.342	0.047
33	0.825	Inspire	0.388	0.046
34	0.850	Inspire	0.432	0.044
35	0.875	Inspire	0.475	0.043
36	0.900	Inspire	0.516	0.041
37	0.925	Inspire	0.555	0.039
38	0.950	Inspire	0.592	0.037
39	0.975	Inspire	0.628	0.035
40	1.000	Inspire	0.661	0.033
41	1.025	Inspire	0.691	0.031
42	1.050	Inspire	0.719	0.028
43	1.075	Inspire	0.744	0.025
44	1.100	Inspire	0.767	0.022
45	1.125	Inspire	0.786	0.019
46	1.150	Inspire	0.802	0.016
47	1.175	Inspire	0.814	0.013
48	1.200	Inspire	0.823	0.009
49	1.225	Inspire	0.829	0.005
50	1.250	—	0.833	0.004
51	1.275	Expire	0.831	-0.002
52	1.300	Expire	0.825	-0.005
53	1.325	Expire	0.816	-0.009
54	1.350	Expire	0.803	-0.013
55	1.375	Expire	0.787	-0.016
56	1.400	Expire	0.768	-0.019

(continues)

△ Table 7.5.6(b) *Continued*

Step Number	Time (seconds)	Inspire/Expire	Volume (L) ± 0.1 L	Volume Change (L) ± 5%
57	1.425	Expire	0.745	-0.022
58	1.450	Expire	0.720	-0.025
59	1.475	Expire	0.692	-0.028
60	1.500	Expire	0.661	-0.031
61	1.525	Expire	0.628	-0.033
62	1.550	Expire	0.592	-0.035
63	1.575	Expire	0.555	-0.038
64	1.600	Expire	0.515	-0.039
65	1.625	Expire	0.474	-0.041
66	1.650	Expire	0.431	-0.043
67	1.675	Expire	0.387	-0.044
68	1.700	Expire	0.341	-0.046
69	1.725	Expire	0.295	-0.047
70	1.750	Expire	0.247	-0.048
71	1.775	Expire	0.198	-0.049
72	1.800	Expire	0.149	-0.049
73	1.825	Expire	0.100	-0.050
74	1.850	Expire	0.050	-0.050
75	1.875	Expire	0.000	-0.050
76	1.900	Expire	-0.051	-0.050
77	1.925	Expire	-0.100	-0.050
78	1.950	Expire	-0.150	-0.050
79	1.975	Expire	-0.199	-0.049
80	2.000	Expire	-0.248	-0.048
81	2.025	Expire	-0.295	-0.048
82	2.050	Expire	-0.342	-0.047
83	2.075	Expire	-0.388	-0.046
84	2.100	Expire	-0.432	-0.044
85	2.125	Expire	-0.475	-0.043
86	2.150	Expire	-0.516	-0.041
87	2.175	Expire	-0.555	-0.039
88	2.200	Expire	-0.592	-0.037
89	2.225	Expire	-0.628	-0.035
90	2.250	Expire	-0.661	-0.033
91	2.275	Expire	-0.691	-0.031
92	2.300	Expire	-0.719	-0.028
93	2.325	Expire	-0.744	-0.025
94	2.350	Expire	-0.767	-0.022
95	2.375	Expire	-0.786	-0.019
96	2.400	Expire	-0.802	-0.016
97	2.425	Expire	-0.814	-0.013
98	2.450	Expire	-0.823	-0.009
99	2.475	Expire	-0.829	-0.005

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1.1 Emergency operations where respiratory protection is needed from IDLH atmospheres includes, but is not limited to, confined spaces, hazardous materials releases, chemical, biological, radiological, nuclear (CBRN) incidents, fire fighting, tactical or technical operations, medical treatment, technical rescue, any operations where the atmosphere is not stable or improving and could become IDLH, and any operations where it is difficult or not possible to accurately monitor the atmosphere.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase “authority having jurisdiction,” or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.3.3 Combination SCBA/SAR. Combination SCBA/SAR consist of the following:

- (1) An SCBA certified as compliant with NFPA 1981 or NFPA 1986
- (2) A connection for the attachment of an air line that provides a continuous supply of breathing air that is independent of the SCBA breathing air supply

The definition does not include SAR that are used in conjunction with escape self-contained breathing apparatus (ESCBA) where ESCBA provide less than a minimum rated service life of 30 minutes. For the purposes of this standard, combination SCBA/SAR are encompassed by the terms *self-contained breathing apparatus* and *SCBA*.

A.3.3.9 Organization. Examples of such organizations include, but are not limited to, fire departments, police and other law enforcement agencies, rescue squads, EMS providers,

military and defense agencies, and hazardous materials response teams.

A.3.3.14 Self-Contained Breathing Apparatus (SCBA). For the purposes of this standard, the terms *self-contained breathing apparatus* and *SCBA* indicate only open-circuit SCBA. Where the term *SCBA* is used without any qualifier in this standard, it indicates only SCBA and combination SCBA/SAR. Combination SCBA/SAR are encompassed by the terms *self-contained breathing apparatus* and *SCBA*.

A.3.3.16 Supplied Air Respirator (SAR). For the purposes of this standard, combination SCBA/SAR are encompassed by the terms *self-contained breathing apparatus* and *SCBA*.

N A.4.2.2 In the event of an emergency services personnel death, or if they become unconscious or suffer a heart attack within 24 hours of using compressed breathing air, chain of custody procedures should be instituted, the respirator selected, the valve closed, and the respirator tagged and submitted to an accredited testing laboratory for analysis. (See Figure A.4.2.2.)

A.4.3.5.3.2(7) A responsible member of the organization should estimate the frequency of SCBA cylinder use. It is not necessary to record or maintain records on the frequency of each SCBA cylinder use. For the purposes of determining the needed frequency of technical inspections of the SCBA cylinder, an estimate of cylinder use is acceptable.

It is also recommended that a responsible member of the organization determine the severity of the environment that the SCBA cylinders are usually exposed to. Where a more severe environment (with regards to hazards such as chemical exposure or physical damage) exists, the organization should contact the SCBA manufacturer for cylinder technical inspection frequency advice.

Where the SCBA manufacturer does not have any technical inspection frequency instructions for SCBA cylinders used with their model, the following guidelines are recommended:

- (1) A routine technical inspection of SCBA cylinders should be performed every 2 or 2½ years when the cylinders are in normal service and are filled or used 5 times a week or less.
- (2) A routine technical inspection of SCBA cylinders should be performed every year (annually) when the SCBA cylinders are in hazardous service, or when they are estimated to be used or filled more than 5 times a week.

The frequency guidelines are not meant to prevent a nonroutine or specially required technical inspection. Where the user has determined that a cylinder condition exists that warrants a technical inspection (see 7.1.2.4), an immediate technical inspection of the cylinder is required.

A.4.3.6 The SCBA manufacturer should be contacted prior to any after-purchase modifications of any sort to an SCBA. Unapproved modifications could affect the NIOSH certification or certification to NFPA 1981 or NFPA 1986 and void the certifications.

A.4.5.1 The purposes of record keeping are to document what the organization has done, to create a record that can be used for compliance with laws or standards, and to provide information for analysis, evaluation, quality control, and planning. The organization should create and maintain a system of record keeping that achieves these purposes.

RESTRICTED ACCESS BAGS FOR GEAR/EQUIPMENT

PURPOSE

To provide the mechanism for the chain of custody, sealed access, and prevention from contamination of evidence, which may assist in determining the cause of malfunction, failure, accident, or injury/casualty.

SCOPE

This applies to all fire department personnel, equipment, and personal protective equipment (PPE).

CONTENT

The intent of these guidelines is to isolate equipment/PPE which, for the purpose of investigation, must be sequestered in as close to the same condition as at the time of the event. Information gathered from this process will assist the investigating officer(s) or agency(s) in cause determination.

PROCEDURE

Any equipment/PPE (non-vehicular) that fails to operate in its designed and prescribed fashion, whether in training or on an emergency incident, shall be sequestered. Employees shall immediately notify either the shift safety officer or a battalion officer to secure the item. The item(s) shall be maintained, as close as possible, in the same condition in which it malfunctioned or failed in order to preserve any evidence for investigation purposes.

When securing SCBA units the air will be turned off, the system bled down, and the “PASS” device turned off. Additionally, when sequestering an SCBA unit, the following shall be noted on the receipt: remaining air in tank; position of air cylinder valve (open/closed/½ open); PASS device status; and was the emergency bypass on or off. If the malfunction was due to free-flowing air, sequester the user's mask also.

All equipment sequestered will be placed into the Restricted Access Bag, zippered shut, and sealed with a “zip” tie around the zipper tabs. To prevent cross contamination, separate items should be placed in separate bags. The sequestering officer will issue a receipt with a detailed inventory (to include all identifying inventory numbers) to the supervisor responsible for the equipment/PPE. Use the enclosed sharpie and ID any opening of the bag and noteseal number on the chain of evidence form.

Once an item has been sequestered, the Shift Safety Officer will take control of the bag. Any time the restricted access bag changes hands, a new receipt, as outlined above, will be issued. The battalion chief of safety will maintain all original receipts at Fire Administration. Entry into the bag will be limited to only those parties authorized by the Battalion Chief of Safety, the Shift Safety Officer, or the Battalion Chief of Resource Management. An inventory of the Restricted Access Bag will be conducted any time the seal is broken and recorded on the inventory form. Any discrepancies in inventory will be immediately reported to the Battalion Chief of Safety. Once the equipment/PPE has reached its final destination and is removed from the Restricted Access Bag, the bag will be properly cleaned, decontaminated, and returned to its original assigned unit.

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FIGURE A.4.2.2 Restricted Access Bags for Gear/Equipment. (Source: Virginia Beach Fire Department)

**VIRGINIA BEACH FIRE DEPARTMENT
RESTRICTED ACCESS BAG RECEIPT**

Date: _____ Time: _____ Incident #: _____

Location item/equipment received: _____

Item/equipment sequestered: _____

City ID#: _____

SCBA information: remaining air in tank; _____ psi. PASS ON/OFF _____

Position of air cylinder valve (open/closed/1/2 open); _____

Emergency bypass on or off _____

Item/equipment assigned to:

Reason for sequestering:
(Be as specific as possible) _____

Item/equipment received from: _____

Date: _____ Time: _____

Item/equipment delivered to: _____

Date: _____ Time: _____

Seal #: _____ Date: _____ Time sealed: _____

Comments: _____

Original: Battalion Chief of Safety Canary: Sequestering Officer Pink: Member Releasing Inventory

FIGURE A.4.2.2 *Continued*

Record keeping should be comprehensive and structured to meet the requirements of this standard and needs of the organization. Record keeping should create, process, maintain, and store information with a minimum of effort, time, and cost. Record keeping should provide sufficient data and findings to allow the organization to analyze and to evaluate the selection, care, and maintenance performed under this standard.

All records, reports, and documents should be accurate and clear. If the reader detects inaccuracy, then the veracity of the writer, as well as the value of the record, could be suspect. Details, without the inclusion of unnecessary information, are necessary. Duplication of information in other forms or reports should be avoided.

A.4.5.2(7) Items to be considered should include the part the record, report, or document plays in the record-keeping system and whether it will be used for checking compliance, tracking, measuring effectiveness, spotting trends, or planning.

A.4.5.3 Some records and reports can be created and stored electronically although other items that are completed by users, such as forms, notices, stickers, and tags, are only practical and effective if tangible.

▲ A.4.7.5 No specific requalification procedures are outlined in 49 CFR for composite cylinders. Therefore, the Department of Transportation (DOT) developed certifications known as *special permits* (previously known as exemptions). DOT-authorized composite cylinders have a maximum service life indicated in the special permits. Most special permits specify that composite cylinders have a maximum life of 15 years, although some 30-year special permits are available. The composite cylinder is prohibited from being refilled after the maximum life specified in the special permit. All U.S. retest facilities performing requalifications on composite cylinders are required by the DOT to have a current copy of the cylinder's special permit available, and to follow its instructions and conditions. The DOT, which is the regulatory authority in the United States, specifies the cylinder requalification frequency of every 3 years for fiberglass or Kevlar composite cylinders and every 5 years for all-metal cylinders and carbon fiber composite cylinders. The organization/cylinder owner and retest facility are required by the DOT to know how often to have the requalification performed. (See also Annex C.)

A.5.1.5(17) SCBA maintenance and repair record keeping should include labeling and tracking SCBA major component assemblies by a unique identification method. Such identification can help to identify and document problems that are specific to a particular component assembly as well as simplify efforts to take corrective action and implement upgrades.

A.5.1.5(18) SCBA that are certified by NIOSH include a rated service time based on laboratory tests required by NIOSH. The SCBA is tested using a specified breathing machine with a breathing rate of 40 L/min. NIOSH uses this 40 L/min rate because it represents a moderate work rate that an average user can sustain for a period of time. To attain a rated service time of 30 minutes during this 40 L/min test, the typical SCBA cylinder has to contain 1200 L or more of compressed breathable air. A 45 ft³ cylinder has a capacity of 1273.5 L, based on 28.3 L/ft³. Because actual work performed by emergency services personnel often results in a ventilation rate that exceeds 40 L/min, these personnel frequently do not attain the rated service time of 30 minutes. During extreme exertion, for example, actual service time can be reduced by 50 percent or more.

To ensure proper utilization of equipment in actual situations, after training and instruction, it is recommended that users gain confidence by actually using the SCBA in a series of tasks representing or approximating the physical demands likely to be encountered.

In addition to the degree of user exertion, other factors that can affect the service time of the SCBA include the following:

- (1) Physical condition of the user (*see also ANSI/AIHA/ASSE Z88.6, Respiratory Protection — Respirator Use — Physical Qualifications for Personnel*)
- (2) Emotional conditions, such as fear or excitement, which can increase the user's breathing rate
- (3) Degree of training or experience the user has had with such equipment
- (4) Whether or not the cylinder is fully charged at the beginning of use
- (5) Facepiece fit
- (6) Use in a pressurized tunnel or caisson [At 2 atmospheres of gauge pressure (29.4 psi), the duration is one-half the duration obtained at one atmosphere of gauge pressure (14.7 psi); at 3 atmospheres of gauge pressure (44.1 psi), the duration is one-third the duration obtained at 1 atmosphere of pressure.]
- (7) Condition of the SCBA
- (8) The SCBA effective dead air space. [Dead air space is a volume proportional to the carbon dioxide (CO₂) concentration in the inhaled breathing gas.]

During normal breathing without a facepiece, CO₂, which is produced by the body's metabolism, is released to the environment with each breath. The facepiece of an SCBA reduces this environment to a small space around the face. On exhalation, a portion of the carbon dioxide-rich exhaled breath is trapped in this space. On inhalation, fresh air from the SCBA cylinder mixes with this carbon dioxide-rich air and then enters the lungs. The concentration of carbon dioxide is dependent on facepiece configuration, flow characteristics, and ventilation rate.

The full effect of increased dead air space has not been demonstrated. However, the scientific work done in this area shows that an increase of CO₂ in the inhalation air leads to increased ventilation and, consequently, shorter service time for a given air supply. Means to reduce CO₂ in the inhalation air by using, for example, a well-fitting nose cup have been demonstrated to give longer service time. Each manufacturer should be contacted for specific data.

A.5.1.8(2) *Quantitative facepiece fit testing* measures the amount (quantity) of leakage around the facepiece-to-face seal. This is normally done, using specifically designed equipment, by measuring the concentration of a detector (challenge) gas or aerosol in the area surrounding a user who is wearing a facepiece and comparing this with the concentration of the challenge gas or aerosol inside the facepiece. Comparing these two concentrations results in a *protection factor* expressed as the following relationship:

$$\text{Protection factor} = 1 \div (\text{concentration in facepiece} / \text{concentration outside facepiece})$$

A high protection factor indicates that a very small amount of the challenge gas or aerosol has passed to inside the facepiece, thus the facepiece provides a high degree of protection to the user being tested.

An alternative facepiece fit test method is the *qualitative fit test*. Qualitative fit testing is based on whether the wearer of a facepiece can detect the presence of the challenge gas or aerosol by sensing the odor of it. This is a highly subjective test where a particular wearer determines whether the quality of air in the facepiece is acceptable. Results of qualitative fit testing are not precise and can vary based on the wearer's senses and the concentration of the challenge gas or aerosol.

A.6.1.4.1 Exposure to chlorine bleach will damage straps and harnesses and cause holes, fraying, fiber fibrillation, and breakage of the strap or harness.

A.6.1.6 Cleaning materials or water in the connection between the cylinder valve and the SCBA inlet connector are forced into the regulator and other pneumatic assemblies and can adversely affect the SCBA's performance over time.

A.6.3.7 SCBA cylinder pressure relief devices, such as frangible discs, are designed to safely relieve the contents of a cylinder when the cylinder internal pressure exceeds $\frac{5}{3}$ of the rated service pressure. One way a cylinder can become overpressurized is when a cylinder is exposed to high heat or fire. The frangible disc pressure relief device is designed to protect a fully charged cylinder. If the cylinder is only partially charged, the cylinder structure can catastrophically fail before the cylinder's internal pressure reaches the pressure at which the pressure relief device functions. The conclusion is that SCBA cylinders in storage should be fully charged rather than partially charged.

A.6.3.7.3 Moisture accelerates the formation of rust, and oxygen could be depleted to dangerous levels over time as oxygen combines with the iron in the steel to form iron oxide.

A.7.1.1.1 For fire departments, a duty period should include, but not be limited to, a single shift in a career department, a substitute person taking over a position for part or all of a shift, personnel assigned to station duty in a department where the station is not staffed on a 24-hour daily basis, and other similar situations.

A.7.1.4.1 Defects that should cause an SCBA cylinder to be removed from service include, but are not limited to, cylinders under the following conditions:

- (1) Not well cared for and maintained
- (2) Dropped, fallen, struck, or crushed
- (3) Stored improperly
- (4) Degraded, deteriorated, or corroded
- (5) In contact with damaging chemicals or an extremely corrosive atmosphere or environment
- (6) Damaged, as evidenced by a dent, gouge, crack, scrape, cut, dig, tear, or abrasion
- (7) Distorted, discolored, or showing the effects of heat exposure including one or more of the following:
 - (a) Charring
 - (b) Blistering
 - (c) Peeling paint or coating
 - (d) Melting
 - (e) Loss of resin or loose fibers on composite cylinders
- (8) Partially or fully repainted or treated to hide suspected damage, or heat or fire damage
- (9) Leaking
- (10) Found depleted when it should have been full with no known reason for it to be in this condition

A.7.2.3.3 Many components in an SCBA, while appearing the same as those commonly available at stores and through catalogue sales, are made of special materials or under specific controls that are necessary to meet the stringent performance requirements of NFPA and NIOSH standards. One of the best examples of this is the manufacturer's use of a particular O-ring material and hardness in conjunction with a certain lubricant. Using a different O-ring or lubricant commonly obtainable from a hardware or plumbing store instead of that supplied by the manufacturer could result in a critical failure of the apparatus under certain conditions, even though the apparatus could appear to perform perfectly well immediately after repair.

A.7.2.3.9 It is recommended that organizations request substantiation from the SCBA manufacturer for any SCBA with no prescribed overhaul period.

A.7.2.4.1 The following is a suggested procedure for handling a breathing air cylinder that has been filled with breathing air that does not meet the requirements specified in 7.3.2 or has been filled with a nonbreathing air gas:

- (1) Determine what gas was put into the cylinder.
- (2) Determine the hazard(s) the gas poses to humans and the environment.
- (3) Where the technician is not or cannot be properly protected or cannot be trained to handle the hazard(s) of the gas, or if the facility is not equipped to properly handle the gas, then the cylinder should be retired to an authorized waste disposal facility that is able to properly discard the gas and cylinder.
- (4) Where the technician is properly protected and trained to handle the identified gas and its hazard(s), and the facility is equipped to properly release and dispose of the gas, then the gas is released to the atmosphere or scrubber, or disposal container, according to local, state/provincial, or federal environmental regulations.
- (5) Purge the cylinder with an inert gas appropriate for the hazard(s) of the incorrect gas to remove any residual gas if the incorrect gas was a hazardous gas.
- (6) Inspect the interior of the cylinder for contamination.
- (7) Where cylinder contamination is found, clean the interior of the cylinder in accordance with the instructions from the SCBA manufacturer.
- (8) Inspect the interior of the cylinder again to verify the cleaning process was successful in removing the contaminant(s).
- (9) Once the empty cylinder passes the visual interior inspection and meets other inspections and performance requirements, the cylinder can be considered for return to service.
- (10) Where the cylinder cannot be properly cleaned, or any condition prevents the cylinder from being returned to service, the cylinder should be retired.

Where the contents of a filled cylinder are unknown, then the gas should not be released and the cylinder should not be purged until the gas is identified by sampling of the cylinder contents before the cylinder is retired and sent to a waste disposal facility in accordance with local, state/provincial, or federal environmental regulations.

A.7.2.4.2 See A.7.1.4.1.

A.7.2.4.3 Many potential highly toxic or lethal agents exist for which the only known remedy is destruction and disposal. The

SCBA manufacturer should affirm a decontamination procedure that achieves both of the following:

- (1) Reduces the toxicity of the agent to a level not harmful to the user
- (2) Does not adversely affect the performance of the SCBA or component

Decontamination procedures are not known for many toxic or lethal agents. Proper disposal of the SCBA or components exposed to such agents is a joint responsibility of the manufacturer and the user organization.

A.7.2.4.6 Some of the rubber (elastomeric) components used in the SCBA have a limited shelf/service life and can degrade below a satisfactory level if used beyond the recommended life. Such aging often appears as cracking or brittleness of the material. SCBA manufacturers often use elastomers such as silicone or ethylene propylene that do not have a limited life, but technicians should be cautious to verify that the usable date has not expired when using materials that do have a limited life.

A.7.3.5 Cylinders should be filled in accordance with the SCBA manufacturers' instructions and NIOSH-approved fill methods for the specific cylinder. Fire departments should also review the requirements in Section 7.15 of NFPA 1500 for additional guidance.

Annex B Instructions for External Examination of SCBA Breathing Air Cylinders

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 Air Cylinder Examination. Instructions for external examination of SCBA cylinders should be obtained from the SCBA manufacturer. If instructions have not been provided or cannot be obtained from the SCBA manufacturer, then the guidelines in B.2 and B.3 can be used.

B.2 Composite SCBA Breathing Air Cylinders. Composite materials often show damage in a variety of ways.

B.2.1 Fiber Damage. Look for signs of the fiber material coming loose or fraying, or for areas where the fiber strands are separating from each other or from the cylinder surface. Look for "frosty" areas; some composite materials when struck with a possibly damaging blow turn a frosty appearance in the area of the damage. Look for signs of cuts, cracks, gouges, and bulges.

B.2.2 Resin Damage. Abnormal resin conditions can also be evidence of damage. Look for signs that the resin part of the composite material is soft, absent or missing, bubbling, or has characteristics described in B.2.4. Look for scrapes or abrasions that have removed the resin coating or expose composite strands.

B.2.3 Chemical Damage. Chemicals can affect resin and composite materials. Some of the effects are not readily apparent and the best way to know what to do is to know if the cylinder has come into contact with any of the following chemical groups:

- (1) Solvents such as paint thinners, kerosene, turpentine, paint solvents, paint cleaners, all paint-like products, Stoddard solvent, epoxy solvents, resin removers, organic solvents

- (2) Vehicle fluids such as materials that contain benzene, glycol (anti-freeze), battery acids, window wash fluids and other alkalis, oils containing solvents, flammable materials, organic volatile materials, gasoline and oil additives, fuels such as gasohol, methanol, gasoline, diesel
- (3) Bases such as materials that contain sodium hydroxide, potassium, and other hydroxides; materials containing strong soap solutions or alkalis
- (4) Acids such as materials that are acids or contain any concentration of acids such as hydrochloric, sulfuric, nitric, phosphoric, acetic acid (vinegar)
- (5) Corrosives such as materials that contain corrosive components or that are corrosive themselves
- (6) Alcohols such as materials that are alcohol or that contain any type of alcohol

If the cylinder has come into contact with an unknown chemical or a chemical not previously listed, contact the SCBA manufacturer for guidance.

B.2.4 Paint Damage. Sometimes, when a painted or coated cylinder has come into contact with one or more of the previously listed chemicals, it is evident by what is happening to the paint. Look for paint that is soft, bubbling, blistering, discolored, lifting off, cracking, or peeling. Knowing what the paint or coating is supposed to look like will be the standard to determine if the cylinder has come into contact with an unknown chemical.

B.3 All-Metal SCBA Breathing Air Cylinders. Metal surfaces are more tolerant to physical and chemical damage than most composite surfaces. Nonetheless, observed metal conditions require that the cylinder be technically inspected.

Look for deep cuts and gouges. Look for dents; dents that are less than 50 mm (2 in.) in diameter are worse than large shallow dents, but no dent over 150 mm (6 in.) in diameter should be acceptable unless it is very shallow. Look for bulges and evidence of heat damage as indicated by charring, coating, or blistering.

Chemical damage to metal surfaces can occur. Look for discolored metal or the paint conditions as noted in B.2.4 if the metal is painted and where the metal looks like the paint has been removed or dissolved. Any discovered condition should be cause to refer the SCBA cylinder to a technical inspection.

Annex C Requalification of SCBA Breathing Air Cylinders

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

C.1 General. Requalification of SCBA cylinders is required for interstate service in the United States, with a frequency depending on the design type of cylinder. The DOT, through the Pipeline and Hazardous Material Safety Administration (PHMSA) agency, issues retester identification numbers (RIN) to retest facilities that can then legally perform cylinder requalifications. Only the DOT has the authority to issue such numbers in the United States.

C.1.1 An applicant is issued an RIN after meeting the agency's requirements and passing an inspection. A third-party independent inspection agency is charged with performing the application inspections and reporting the results to the PHMSA. Once issued, the RIN is good for 5 years provided that the retest facility maintains equipment and personnel at the

degree observed at the time of the original application inspection.

C.1.2 The SCBA cylinder requalification process includes a visual inspection, both internal and external; the hydrostatic test; marking or labeling; and maintenance of proper records of the requalification. Each retest facility has to perform all these functions during a cylinder requalification. Information about the hydrostatic retest is found in 49 CFR 173.34(e).

▲ C.2 Special Permits (Formerly Known as Exemptions). No specific requalification procedures are outlined in 49 CFR for composite cylinders. Therefore, DOT developed certifications known as *special permits* (previously known as exemptions).

C.2.1 All composite cylinders authorized for sale and use in the United States have a DOT special permit number (previously known as an exemption number). This is what is meant by *DOT-authorized*. Information on special permits is found in 49 CFR.

C.2.2 DOT special permitted cylinders are requalified according to specific conditions and frequency written in the special permit. All U.S. retest facilities performing requalifications on composite cylinders are required by DOT to have a current copy of the cylinder's special permit available and have to follow its instructions and conditions. The organization/cylinder owner and retest facility are required by DOT to know how often to have the requalification performed.

C.3 Frequency Regulatory Agency. DOT, which is the regulatory authority in the United States, specifies the cylinder requalification frequency. Any agency, cylinder manufacturer, SCBA unit manufacturer, or industry can recommend a more stringent requalification frequency or can recommend a shorter frequency for just the inspection portion of the requalification. The scuba industry, for instance, performs a voluntary annual visual inspection (internal and external) on all-metal scuba cylinders, in addition to the required requalification.

NIOSH and DOT both recommend a different inspection frequency (not requalification) than that required for all-metal SCBA cylinders manufactured by Luxfer USA prior to July 1988. These cylinders were manufactured using 6351 aluminum alloy, and there is a chance for cracking to develop in the neck region (thread region) or crown of the cylinder. Regardless of whether the inspection recommendation is followed or if the cylinder is requalified as required, if the inspection is not properly and diligently performed, the cylinder could be unsafe to fill. This applies to *any* cylinder requalification. The internal and external inspection, hydro testing, marking, and record keeping has to be properly and diligently performed.

Every organization should verify that the retest facility where their SCBA cylinders are requalified is a duly qualified DOT/PHMSA retest facility, holds a valid RIN, and is diligently performing the requalification. If in doubt, contact the DOT for verification that the retest facility is authorized or find a different DOT/PHMSA retest facility. If the organization suspects that the retest facility has not properly or diligently performed the requalification, the DOT Hazardous Materials Enforcement Branch should be contacted at (202) 366-4700.

DOT-authorized composite cylinders have a maximum service life indicated in the special permit (previously known as an exemption). Most special permits specify that composite cylinders have a maximum life of 15 years. The composite cylinder

is prohibited from being refilled after 15 years from the original hydrostatic test date.

The service life of all-metal cylinders is determined at the time of requalification. If the cylinder passes the requalification, it can be used until the cylinder shows signs of serious external damage (*see 7.1.2.4 and Annex B*) or until its next requalification.

C.4 Requalification Process. A brief description of the requalification process follows. The cylinder is first de-valved and all internal and external surfaces made visible to the retester. The cylinder is internally and externally visually inspected according to required DOT specifications. If it passes, the hydrostatic test is performed next.

To hydro-test the cylinder, it is placed inside of a water jacket or bath (containing water) that is specially sealed. The cylinder is filled with water. The cylinder is pressurized with more water. The cylinder expands a little and displaces water in the water jacket. The amount of water displaced in the water jacket is measured by a precision method. This amount of water displaced represents how much the cylinder expanded under pressure. When the water pressure returns to normal, the amount of expansion that still exists (the water not taken back into the water jacket) is called the *permanent expansion*. This information is recorded and compared to DOT requirements to determine if the two expansions of the cylinder comply with DOT regulations.

If the cylinder passes the internal and external inspection and retest, the retester marks the all-metal cylinder by stamping into the metal or labels the composite cylinder with a label sealed in resin. The information marked or labeled includes the RIN identification and the retest date. A record is then made of the requalification with the information required by the DOT.

The retester is required to stamp out cylinder DOT markings with Xs or with the word "Condemned" if the cylinder does not pass the requalification process. Cylinders that are fully wrapped with composite materials that do not pass requalification are labeled condemned. The cylinder should be rendered unable to hold pressure with the permission of the cylinder owner. It is recommended that all organizations permit the retest facility to render condemned cylinders unable to hold pressure by drilling through the cylinder or destroying valve threads. A record is made of condemned cylinders, according to DOT requirements.

Annex D Informational References

D.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

D.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 19B, *Standard on Respiratory Protective Equipment for Firefighters*, 1971 edition.

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

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

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire Fighters*, 1981 edition.

NFPA 1986, *Standard on Respiratory Protection Equipment for Tactical and Technical Operations*, 2017 edition.

D.1.2 Other Publications.

D.1.2.1 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI/AIHA/ASSE Z88.6, *Respiratory Protection — Respirator Use — Physical Qualifications for Personnel*, 2006.

D.1.2.2 U.S. Government Publications. U.S. Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

Title 29, Code of Federal Regulations, Part 1910.156, 7 August 2012.

Title 49, Code of Federal Regulations, Parts 100–199, 1999.

D.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

Δ D.2.1 CGA Publications. Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151-1788.

CGA C-6.2, *Standard for the Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders*, 2013.

D.2.2 DOT Special Permits. Associate Administrator for Department of Transportation, Washington, DC 20590, Attention: DHM-31.

D.2.3 PSI-PCI Publications. Professional Scuba Inspectors, Inc., 1183 University Drive, Suite 105-226, Burlington, NC 27216.

William L. High, *Inspecting Cylinders*.

SCBA Cylinder Technician Inspection, Training, and Certification.

D.3 References for Extracts in Informational Sections. (Reserved)

Index

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Sequence of Events for the Standards Development Process

Once the current edition is published, a Standard is opened for Public Input.

Step 1 – Input Stage

- Input accepted from the public or other committees for consideration to develop the First Draft
- Technical Committee holds First Draft Meeting to revise Standard (23 weeks); Technical Committee(s) with Correlating Committee (10 weeks)
- Technical Committee ballots on First Draft (12 weeks); Technical Committee(s) with Correlating Committee (11 weeks)
- Correlating Committee First Draft Meeting (9 weeks)
- Correlating Committee ballots on First Draft (5 weeks)
- First Draft Report posted on the document information page

Step 2 – Comment Stage

- Public Comments accepted on First Draft (10 weeks) following posting of First Draft Report
- If Standard does not receive Public Comments and the Technical Committee chooses not to hold a Second Draft meeting, the Standard becomes a Consent Standard and is sent directly to the Standards Council for issuance (see Step 4) or
- Technical Committee holds Second Draft Meeting (21 weeks); Technical Committee(s) with Correlating Committee (7 weeks)
- Technical Committee ballots on Second Draft (11 weeks); Technical Committee(s) with Correlating Committee (10 weeks)
- Correlating Committee Second Draft Meeting (9 weeks)
- Correlating Committee ballots on Second Draft (8 weeks)
- Second Draft Report posted on the document information page

Step 3 – NFPA Technical Meeting

- Notice of Intent to Make a Motion (NITMAM) accepted (5 weeks) following the posting of Second Draft Report
- NITMAMs are reviewed and valid motions are certified by the Motions Committee for presentation at the NFPA Technical Meeting
- NFPA membership meets each June at the NFPA Technical Meeting to act on Standards with “Certified Amending Motions” (certified NITMAMs)
- Committee(s) vote on any successful amendments to the Technical Committee Reports made by the NFPA membership at the NFPA Technical Meeting

Step 4 – Council Appeals and Issuance of Standard

- Notification of intent to file an appeal to the Standards Council on Technical Meeting action must be filed within 20 days of the NFPA Technical Meeting
- Standards Council decides, based on all evidence, whether to issue the standard or to take other action

Notes:

1. Time periods are approximate; refer to published schedules for actual dates.
2. Annual revision cycle documents with certified amending motions take approximately 101 weeks to complete.
3. Fall revision cycle documents receiving certified amending motions take approximately 141 weeks to complete.

Committee Membership Classifications^{1,2,3,4}

The following classifications apply to Committee members and represent their principal interest in the activity of the Committee.

1. M *Manufacturer*: A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.
2. U *User*: A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.
3. IM *Installer/Maintainer*: A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.
4. L *Labor*: A labor representative or employee concerned with safety in the workplace.
5. RT *Applied Research/Testing Laboratory*: A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.
6. E *Enforcing Authority*: A representative of an agency or an organization that promulgates and/or enforces standards.
7. I *Insurance*: A representative of an insurance company, broker, agent, bureau, or inspection agency.
8. C *Consumer*: A person who is or represents the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in (2).
9. SE *Special Expert*: A person not representing (1) through (8) and who has special expertise in the scope of the standard or portion thereof.

NOTE 1: “Standard” connotes code, standard, recommended practice, or guide.

NOTE 2: A representative includes an employee.

NOTE 3: While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of member or unique interests need representation in order to foster the best possible Committee deliberations on any project. In this connection, the Standards Council may make such appointments as it deems appropriate in the public interest, such as the classification of “Utilities” in the National Electrical Code Committee.

NOTE 4: Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.

Submitting Public Input / Public Comment Through the Online Submission System

Soon after the current edition is published, a Standard is open for Public Input.

Before accessing the Online Submission System, you must first sign in at www.nfpa.org. *Note: You will be asked to sign-in or create a free online account with NFPA before using this system:*

- a. Click on Sign In at the upper right side of the page.
- b. Under the Codes and Standards heading, click on the “List of NFPA Codes & Standards,” and then select your document from the list or use one of the search features.

OR

- a. Go directly to your specific document information page by typing the convenient shortcut link of www.nfpa.org/document# (Example: NFPA 921 would be www.nfpa.org/921). Sign in at the upper right side of the page.

To begin your Public Input, select the link “The next edition of this standard is now open for Public Input” located on the About tab, Current & Prior Editions tab, and the Next Edition tab. Alternatively, the Next Edition tab includes a link to Submit Public Input online.

At this point, the NFPA Standards Development Site will open showing details for the document you have selected. This “Document Home” page site includes an explanatory introduction, information on the current document phase and closing date, a left-hand navigation panel that includes useful links, a document Table of Contents, and icons at the top you can click for Help when using the site. The Help icons and navigation panel will be visible except when you are actually in the process of creating a Public Input.

Once the First Draft Report becomes available there is a Public Comment period during which anyone may submit a Public Comment on the First Draft. Any objections or further related changes to the content of the First Draft must be submitted at the Comment stage.

To submit a Public Comment you may access the online submission system utilizing the same steps as previously explained for the submission of Public Input.

For further information on submitting public input and public comments, go to: <http://www.nfpa.org/publicinput>.

Other Resources Available on the Document Information Pages

About tab: View general document and subject-related information.

Current & Prior Editions tab: Research current and previous edition information on a Standard.

Next Edition tab: Follow the committee’s progress in the processing of a Standard in its next revision cycle.

Technical Committee tab: View current committee member rosters or apply to a committee.

Technical Questions tab: For members and Public Sector Officials/AHJs to submit questions about codes and standards to NFPA staff. Our Technical Questions Service provides a convenient way to receive timely and consistent technical assistance when you need to know more about NFPA codes and standards relevant to your work. Responses are provided by NFPA staff on an informal basis.

Products & Training tab: List of NFPA’s publications and training available for purchase.

Information on the NFPA Standards Development Process

I. Applicable Regulations. The primary rules governing the processing of NFPA standards (codes, standards, recommended practices, and guides) are the NFPA *Regulations Governing the Development of NFPA Standards (Regs)*. Other applicable rules include NFPA *Bylaws*, NFPA *Technical Meeting Convention Rules*, NFPA *Guide for the Conduct of Participants in the NFPA Standards Development Process*, and the NFPA *Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council*. Most of these rules and regulations are contained in the *NFPA Standards Directory*. For copies of the *Directory*, contact Codes and Standards Administration at NFPA Headquarters; all these documents are also available on the NFPA website at “www.nfpa.org.”

The following is general information on the NFPA process. All participants, however, should refer to the actual rules and regulations for a full understanding of this process and for the criteria that govern participation.

II. Technical Committee Report. The Technical Committee Report is defined as “the Report of the responsible Committee(s), in accordance with the Regulations, in preparation of a new or revised NFPA Standard.” The Technical Committee Report is in two parts and consists of the First Draft Report and the Second Draft Report. (See *Regs* at Section 1.4.)

III. Step 1: First Draft Report. The First Draft Report is defined as “Part one of the Technical Committee Report, which documents the Input Stage.” The First Draft Report consists of the First Draft, Public Input, Committee Input, Committee and Correlating Committee Statements, Correlating Notes, and Ballot Statements. (See *Regs* at 4.2.5.2 and Section 4.3.) Any objection to an action in the First Draft Report must be raised through the filing of an appropriate Comment for consideration in the Second Draft Report or the objection will be considered resolved. [See *Regs* at 4.3.1(b).]

IV. Step 2: Second Draft Report. The Second Draft Report is defined as “Part two of the Technical Committee Report, which documents the Comment Stage.” The Second Draft Report consists of the Second Draft, Public Comments with corresponding Committee Actions and Committee Statements, Correlating Notes and their respective Committee Statements, Committee Comments, Correlating Revisions, and Ballot Statements. (See *Regs* at 4.2.5.2 and Section 4.4.) The First Draft Report and the Second Draft Report together constitute the Technical Committee Report. Any outstanding objection following the Second Draft Report must be raised through an appropriate Amending Motion at the NFPA Technical Meeting or the objection will be considered resolved. [See *Regs* at 4.4.1(b).]

V. Step 3a: Action at NFPA Technical Meeting. Following the publication of the Second Draft Report, there is a period during which those wishing to make proper Amending Motions on the Technical Committee Reports must signal their intention by submitting a Notice of Intent to Make a Motion (NITMAM). (See *Regs* at 4.5.2.) Standards that receive notice of proper Amending Motions (Certified Amending Motions) will be presented for action at the annual June NFPA Technical Meeting. At the meeting, the NFPA membership can consider and act on these Certified Amending Motions as well as Follow-up Amending Motions, that is, motions that become necessary as a result of a previous successful Amending Motion. (See 4.5.3.2 through 4.5.3.6 and Table 1, Columns 1-3 of *Regs* for a summary of the available Amending Motions and who may make them.) Any outstanding objection following action at an NFPA Technical Meeting (and any further Technical Committee consideration following successful Amending Motions, see *Regs* at 4.5.3.7 through 4.6.5.3) must be raised through an appeal to the Standards Council or it will be considered to be resolved.

VI. Step 3b: Documents Forwarded Directly to the Council. Where no NITMAM is received and certified in accordance with the Technical Meeting Convention Rules, the standard is forwarded directly to the Standards Council for action on issuance. Objections are deemed to be resolved for these documents. (See *Regs* at 4.5.2.5.)

VII. Step 4a: Council Appeals. Anyone can appeal to the Standards Council concerning procedural or substantive matters related to the development, content, or issuance of any document of the NFPA or on matters within the purview of the authority of the Council, as established by the Bylaws and as determined by the Board of Directors. Such appeals must be in written form and filed with the Secretary of the Standards Council (see *Regs* at Section 1.6). Time constraints for filing an appeal must be in accordance with 1.6.2 of the *Regs*. Objections are deemed to be resolved if not pursued at this level.

VIII. Step 4b: Document Issuance. The Standards Council is the issuer of all documents (see Article 8 of *Bylaws*). The Council acts on the issuance of a document presented for action at an NFPA Technical Meeting within 75 days from the date of the recommendation from the NFPA Technical Meeting, unless this period is extended by the Council (see *Regs* at 4.7.2). For documents forwarded directly to the Standards Council, the Council acts on the issuance of the document at its next scheduled meeting, or at such other meeting as the Council may determine (see *Regs* at 4.5.2.5 and 4.7.4).

IX. Petitions to the Board of Directors. The Standards Council has been delegated the responsibility for the administration of the codes and standards development process and the issuance of documents. However, where extraordinary circumstances requiring the intervention of the Board of Directors exist, the Board of Directors may take any action necessary to fulfill its obligations to preserve the integrity of the codes and standards development process and to protect the interests of the NFPA. The rules for petitioning the Board of Directors can be found in the *Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council* and in Section 1.7 of the *Regs*.

X. For More Information. The program for the NFPA Technical Meeting (as well as the NFPA website as information becomes available) should be consulted for the date on which each report scheduled for consideration at the meeting will be presented. To view the First Draft Report and Second Draft Report as well as information on NFPA rules and for up-to-date information on schedules and deadlines for processing NFPA documents, check the NFPA website (www.nfpa.org/docinfo) or contact NFPA Codes & Standards Administration at (617) 984-7246.



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