NFPA®

1670

Standard on Operations and Training for Technical Search and Rescue Incidents

2017

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NFPA® 1670

Standard on

Operations and Training for Technical Search and Rescue Incidents

2017 Edition

This edition of NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, was prepared by the Technical Committee on Technical Search and Rescue. It was issued by the Standards Council on November 11, 2016, with an effective date of December 1, 2016, and supersedes all previous editions.

This edition of NFPA 1670 was approved as an American National Standard on December 1, 2016.

Origin and Development of NFPA 1670

The responsibility for NFPA 1470, *Standard on Search and Rescue Training for Structural Collapse Incidents*, 1994 edition, was transferred to the Technical Committee on Technical Rescue, which prepared a proposed new standard, NFPA 1670, *Standard on Operations and Training for Technical Rescue Incidents*. That document incorporated the scope of NFPA 1470, expanding it to include identifying and establishing levels of functional capability for safety and effectively conducting operations at technical rescue incidents.

The 2004 edition of NFPA 1670 represented a complete revision and incorporated reorganization of the chapters to comply with the new *Manual of Style for NFPA Technical Committee Documents*. The title of the document was changed to *Standard on Operations and Training for Technical Search and Rescue Incidents* as a result of a petition by the Technical Committee to the Standards Council to include "search" as part of the scope of the Committee. The search element was also added to each of the disciplines within the document

The committee acknowledged the valuable contributions of George Howard to the origin and development of this document. Mr. Howard was working as a police officer for the New York and New Jersey Port Authority when he perished in the line of duty on September 11, 2001, at the World Trade Center at the age of 44. He was a 16-year veteran of the department and a founding member of its elite emergency services division and was awarded the New York Police Department's Medal of Valor for rescuing children trapped in the World Trade Center during the 1993 bombing. Mr. Howard was a charter member of the NFPA Technical Rescue Technical Committee, on which he represented the Nassau County (NY) Fire Academy. His enlightened influence and hard work will always be a part of this document.

In the third edition of NFPA 1670, the Vehicle and Machinery Search and Rescue component was split into two separate chapters, and new chapters on Cave Search and Rescue, Mine and Tunnel Search and Rescue, and Helicopter Search and Rescue were added, resulting in renumbering of chapters within the document. Annex G was updated with material on the Search Assessment Marking System, and Annex H was revised with guidelines for initial response planning. Annex I was deleted, and the remaining annexes were renumbered.

For the 2014 edition, the committee added new chapters on Tower Rescue and Animal Technical Rescue. Chapter 16, Tower Rescue, was incorporated into the standard to address the significant hazards posed to technical rescuers associated with the removal of ill or injured persons from manmade tower structures. The adoption of the PETS Act in October 2006 authorized FEMA to provide rescue, care, shelter, and essential needs for individuals with household pets and service animals—and for the household pets and animals themselves—following a major disaster or emergency. That prompted the committee to incorporate a new Chapter 17, Animal Technical Rescue, and a new Annex K, Animal Technical Rescue, to address the significant hazards posed to technical rescuers associated with the rescue of injured or entrapped animals. Other notable changes to the 2014 edition included the reorganization of Chapter 3, Definitions; changes to confined space rescue team size requirements in Chapter 7, Confined Space Search and Rescue; new requirements

specific to floods in Chapter 9, Water Search and Rescue; and new requirements specific to elevators in Chapter 12, Machinery Search and Rescue.

The NFPA Technical Committee on Technical Search and Rescue recognized the contributions of our colleague, long-time staff liaison, and friend, Frank Florence (1943–2010). Frank passed away on July 27, 2010, after a relatively brief illness. He served with the Salt Lake City Fire Department for 31 years before retiring as Fire Chief. After retiring from SLCFD, Frank joined the NFPA in September of 1998 and served as the staff liaison for the Technical Search and Rescue Committee for twelve years. Frank was a strong advocate for the work of our committee and of the SAR community in general. His memory and contributions will continue to influence NFPA 1670, and the committee is forever grateful for his support and assistance.

For the 2017 edition, NFPA 1670 underwent a significant restructuring. Significant work was done to correlate the material found in both NFPA 1670 and NFPA 1006 through a joint task group. Correlation establishes a consensus for Awareness, Operations, and Technician for emergency responder levels between the documents, utilizing the same definitions in NFPA 1670 and NFPA 1006 and aligning chapters where possible. Chapters have been created for Floodwater and Watercraft to further reflect various water-type rescue challenges.

The NFPA Technical Committee on Technical Search and Rescue would like to recognize the contributions of our colleague and friend, Steve Hudson (1950-2013). Steve's insight and expertise were invaluable in the development of rope rescue system aspects throughout the standard, and his contributions will continue to be ever present. Steve's contributions and comradery will be missed.

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

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

Committee Scope: This Committee shall have primary responsibility for documents on technical search and rescue techniques, operations, and procedures to develop efficient, proper, and safe utilization of personnel and equipment.

Contents

NFPA 1670

Standard on

Operations and Training for Technical Search and Rescue Incidents

2017 Edition

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

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

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

Chapter 1 Administration

1.1 Scope.

1.1.1* This standard shall identify and establish levels of functional capability for conducting operations at technical search and rescue incidents while minimizing threats to rescuers.

1.1.2* The requirements of this standard shall apply to organizations that provide response to technical search and rescue incidents, including those not regulated by governmental mandates.

1.1.3* It is not the intent of this document to be applied to individuals and their associated skills and/or qualifications.

1.2* Purpose.

1.2.1 The purpose of this standard shall be to assist the authority having jurisdiction (AHJ) in assessing a technical search and rescue hazard within the response area, to identify the level of operational capability, and to establish operational criteria.

1.2.2 The functional capabilities of this standard shall be permitted to be achieved in a variety of ways.

1.3 Equivalency. Nothing in this standard shall be intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety in place of those prescribed by this standard, provided technical documentation is submitted to the authority having jurisdiction to demonstrate equivalency and the system, method, or device is approved for the intended purpose.

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 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents,* 2013 edition.

NFPA 1006, *Standard for Technical Rescue Personnel Professional Qualifications,* 2017 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program,* 2013 edition.

NFPA 1561 *Standard on Emergency Services Incident Management System and Command Safety* 2014 edition.

2.3 Other Publications.

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

ANSI/CGA G7.1, *Commodity Specification for Air*, 2011.

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

FEMA National Response Framework, 2nd edition, 2013.

FEMA National Urban Search and Rescue (US&R) Response System, 2006.

U.S. Coast Guard National Search and Rescue Committee, *U.S. National Search and Rescue Plan,* 2007.

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

National Cave Rescue Commission of the National Speleological Society — Cave Orientation Course.

2.4 References for Extracts in Mandatory Sections.

NFPA 1006, *Standard for Technical Rescue Personnel Professional Qualifications,* 2017 edition.

NFPA 1021, *Standard for Fire Officer Professional Qualifications,* 2014 edition.

NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications,* 2015 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety,* 2014 edition.

NFPA 1983, *Standard on Life Safety Rope and Equipment for Emergency Services,* 2017 edition.

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, footno e, 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 Acceptable Entry Conditions. Conditions that must exist in a space to allow entry and to ensure that employees can safely enter into and work within the space.

3.3.2 Alternate Air Source. A secondary air supply source system that involves an alternate second-stage regulator provided by either a separate dedicated second-stage or a multipurpose second-stage regulator coupled with a buoyancy compensator inflator valve.

3.3.3 Anchor Point. A single, structural component used either alone or in combination with other components to create an anchor system capable of sustaining the actual and potential load on the rope rescue system.

3.3.4 Anchor System. One or more anchor points rigged in such a way as to provide a structurally significant connection point for rope rescue system components.

3.3.5 Animal Technical Rescue. Rescuing of an animal requiring technical skills; not to be confused with "animal rescue" which typically refers to abuse or neglect.

3.3.6 Ascending Device. A type of rope grab; auxiliary equipment; a friction or mechanical device utilized to allow ascending a fixed line. [**1983,** 2017]

3.3.7 Ascending (Line). A means of safely traveling up a fixed line with the use of one or more ascent devices.

3.3.8 Assessment Phase (Size-Up). The process of assessing the conditions, the scene, and the subject's condition and ability to assist in his or her own rescue.

3.3.9 Auxiliary Equipment. Equipment items that are load-bearing and designed to be utilized with life safety rope and harness. [**1983,** 2017]

3.3.10* Avalanche. A mass of snow — sometimes containing ice, water, and debris — that slides down a mountainside.

3.3.11* Belay. The method by which a potential fall distance is controlled to minimize damage to equipment and/or injury to a live load.

3.3.12 Bell-Bottom Pier Hole. A type of shaft or footing excavation, the bottom of which is made larger than the cross-section above to form a bell shape.

3.3.13 Benching or Benching System. A method of protecting employees from cave-ins by excavating the side of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

3.3.14 Bend. A knot that joins two ropes or webbing pieces together.

3.3.15* Body Substance Isolation. An infection control strategy that considers all body substances potentially infectious. It utilizes procedures and equipment to protect the responder from commun cable diseases that are known to be transmitted through blood and other body substances.

3.3.16 Buoyancy Compensator (BCD). Device worn by a diver containing a bladder that is inflated or deflated by the diver to manage their buoyancy while immersed in a liquid.

3.3.17* Cave. A natural underground void formed by geologic process. [**1006,** 2017]

3.3.18 Cave-In. The separation of a mass of soil or rock material from the side of an excavation or trench, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

3.3.19 Collapse Safety Zone. An area around a collapsed structure or structures that is outside the potential collapse zone of falling debris.

3.3.20 Compass. A device that uses the earth's magnetic field to indicate relative direction.

3.3.21 Competent Person. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. [**1006,** 2017]

3.3.22* Confined Space. A space that is large enough and so configured that a person can enter and perform assigned work, that has limited or restricted means for entry or exit (e.g.,