NFPA®

76

Standard for the Fire Protection of Telecommunications Facilities

2020

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NFPA® 76

Standard for the

Fire Protection of Telecommunications Facilities

2020 Edition

This edition of NFPA 76, *Standard for the Fire Protection of Telecommunications Facilities,* was prepared by the Technical Committee on Telecommunications. It was issued by the Standards Council on November 4, 2019, with an effective date of November 24, 2019, and supersedes all previous editions.

This edition of NFPA 76 was approved as an American National Standard on November 24, 2019.

Origin and Development of NFPA 76

In April 1996, the NFPA Standards Council approved a new committee project to develop documents on fire protection for telecommunications networks. The Technical Committee on Telecommunications focused on network reliability of public telecommunications. The committee was responsive to fire protection challenges identified by the Network Reliability Council, which was sponsored by the Federal Communications Commission (FCC).

The first edition of NFPA 76, *Recommended Practice for the Fire Protection of Telecommunications Facilities*, published in 2002, was created to be used as a performance-based document in the format established by NFPA for performance documents.

The document was changed from a recommended practice to a standard for the 2005 edition. Requirements for large and small telecommunications facilities were combined into one chapter. A chapter was added for redundant-based or replacement-based approaches.

For the 2009 edition, the standard was edited to improve the language and clarify the technical committee's intent. Sections were revised to reflect changes to the signal-processing equipment areas. In addition, the requirements for early warning fire detection and very early warning fire detection were updated.

The 2012 edition featured a new section on aisle containment systems for telecommunications equipment and how these systems must be assessed for their interaction with fire protection features. Revisions were made to make the requirements of the standard easier to enforce. A number of definitions were extracted from *NFPA 70, National Electrical Code*, to define terms used in the body of the standard that were not defined in previous editions.

The 2016 edition included language that clarified and emphasized the intent of the standard as it applies to existing and altered facilities retroactively. A new chapter on small unoccupied structures, which were had been excluded from the scope of this standard, was added. The new chapter provided the minimum requirements to be applied to such structures.

The 2020 edition of the standard includes clarification of battery terminology. Flooded lead-acid and flooded NiCd batteries are now called *vented lead-acid* and *vented NiCd* batteries. The term *lithium* was changed to *lithium-ion* throughout the document to specify a type of lithium battery. Spill control requirements for sodium nickel batteries was deleted; these batteries do not need spill control because of the battery chemistry. The term *smoke detectors* was changed to *spot-type smoke detectors* to refer to a type of smoke detector that is discussed in the requirements and does not apply to other types of smoke detectors.

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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 fire protection for telecommunication networks.

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Standard for the

Fire Protection of Telecommunications Facilities

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

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. 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 and extracted publications can be found in Chapter 2 and Annex G.

Chapter 1 Administration

1.1* Scope. This standard provides requirements for fire protection of telecommunications facilities, including landline, cable, wireless, and satellite telecommunication services such as telephone/voice, voice over internet protocol (VoIP), internet, data, and video transmission that are rendered to the public.

1.1.1 Telecommunications facilities include signal-processing equipment areas, cable entrance facility areas, power areas, main distribution frame areas, standby engine areas, technical support areas, administrative areas, and building services and support areas occupied by a telecommunications service provider.

1.2* Purpose. The provisions of this standard shall provide a minimum level of fire protection in telecommunications facilities, provide a minimum level of life safety for the occupants, and protect the telecommunications equipment and service continuity.

1.3* Application. The provisions of this standard shall provide a reasonable level of protection from loss of life, property, and service continuity from fire.

1.3.1 The requirements of Chapter 4 shall determine the fire protection program for each facility.

1.3.1.1 Provisions for small structures that are normally unoccupied and that house telecommunications equipment, including on-grade, walk-in cabinets; on-grade huts; cell huts; and controlled environmental vaults (CEVs), are provided in Chapter 11.

1.3.2* For purposes of application of NFPA *101* and *NFPA 5000*, telecommunications facilities shall be classified as special-purpose industrial occupancies.

N **1.3.3** This standard shall apply to free-standing telecommunications facilities, as well as joint-use facilities where separated by a fire-resistance-rated partition in accordance with 6.1.4.2.

1.4 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time this standard was issued.

1.4.1 Unless otherwise specified, the provisions of this standard shall not apply to telecommunications facilities that existed or were approved for construction or installation prior to the effective date of this standard.

1.4.1.1 Building alterations or new equipment installations in existing facilities shall provide a reasonable level of fire protection for the changed purposes of the facility.

1.4.1.2 Fire protection systems in excess of the features required in this standard shall be permitted to be left in service, removed, or abandoned in place.

1.4.1.3 Fire protection systems abandoned in place shall be clearly identified as no longer being in service.

1.4.2 The provisions of Chapters 9 and 10 shall apply to new and existing telecommunications facilities.

1.4.3 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.4.4 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction and only where it is clearly evident that a reasonable degree of safety is provided.

1.5* Design Options.

1.5.1 Fire protection for the individual hazard areas identified in the standard shall be based on the performance-based approach of Chapter 5, the prescriptive-based approach of Chapter 6, or the redundant- or replacement-based approach of Chapter 7.

1.5.2* Any of the three approaches shall be used selectively by hazard area or in any combination.

1.5.3 Protection of continuity from fire for telecommunications facilities using redundant or replacement-based approaches shall comply with Chapter 7.

1.5.4 Chapters 1, 4, 9, and 10 shall apply to all telecommunications facilities within the scope of this standard except those covered by Chapter 11, regardless of the design approach taken.

1.6 Equivalency. Nothing in this standard is intended to prevent the use of calculation methods, test methods, systems, methods, or devices of superior quality, strength, fire resistance, effectiveness, durability, and safety as alternatives to those required 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 1, *Fire Code,* 2018 edition.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2018 edition.

NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems,* 2018 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2019 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems,* 2019 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,* 2020 edition.

NFPA 30, *Flammable and Combustible Liquids Code,* 2018 edition.

NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines,* 2018 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work,* 2019 edition.

NFPA 54/ANSI Z223.1, *National Fuel Gas Code,* 2018 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2020 edition.

NFPA 70®, National Electrical Code®, 2020 edition.

NFPA 72®, National Fire Alarm and Signaling Code®, 2019 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives,* 2019 edition.

NFPA 80A, *Recommended Practice for Protection of Buildings from Exterior Fire Exposures,* 2017 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2018 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,* 2017 edition.

NFPA *101®, Life Safety Code®,* 2018 edition.

NFPA 220, *Standard on Types of Building Construction,* 2018 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2019 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies,* 2017 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies,* 2017 edition.

NFPA 262, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces,* 2019 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response,* 2017 edition.

NFPA 750, *Standard on Water Mist Fire Protection Systems,* 2019 edition.

NFPA 780, *Standard for the Installation of Lightning Protection Systems,* 2020 edition.

NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems,* 2018 edition.

NFPA 5000®, Building Construction and Safety Code®, 2018 edition.

2.3 Other Publications.

2.3.1 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials,* 2018.

ASTM E814, *Standard Test Method for Fire Tests of Penetration Firestop Systems,* 2013a, reapproved 2017.

ASTM E1537, *Standard Test Method for Fire Testing of Upholstered Furniture,* 2016.

ASTM E1966, *Standard Test Method for Fire Resistive Joint Systems,* 2015.

2.3.2 ATIS Publications. Alliance for Telecommunications Industry Solutions, 1200 G Street NW, Suite 500, Washington, DC 20005.

ATIS 0600307, *Fire Resistance Criteria — Ignitability Requirements for Equipment Assemblies, Ancillary Non-Metallic Apparatus, and Fire Spread Requirements for Wire and Cable,* 2014.

ATIS 0600319, *Equipment Assemblies — Fire Propagation Risk Assessment Criteria,* 2014.

2.3.3 CSA Publications. CSA Group, 178 Rexdale Boulevard, Toronto, ON M9W 1R3, Canada.

C22.2 No. 0.3, *Test Methods for Electrical Wires and Cables,* 2009, revised 2014.

Δ **2.3.4 UL Publications.** Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 44, *Thermoset-Insulated Wires and Cables,* 2017.

ANSI/UL 83, *Thermoplastic-Insulated Wire and Cables,* 2017.

ANSI/UL 444, *Communications Cables,* 2017.

ANSI/UL 568, *Nonmetallic Cable Tray Systems,* 2002.

ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials,* 2018.

ANSI/UL 900, *Standard for Air Filter Units,* 2015.

ANSI/UL 1277, *Electrical Power and Control Tray Cables with Optional Optical-Fiber Members,* 2018.

ANSI/UL 1564, *Standard for Industrial Battery Chargers,* 2015.

ANSI/UL 1651, *Optical Fiber Cable,* 2015.

ANSI/UL 1666, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts,* 2007.

ANSI/UL 1685, *Standard for Vertical Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, 2015.

ANSI/UL 1973 *Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications*, 2018.

ANSI/UL 2024, *Cable Routing Assemblies and Communications Raceways*, 2014, revised 2015.

ANSI/UL 9540, *Outline of Investigation for Energy Storage Systems and Equipment*, 2016.

ANSI/UL 60950-1, *Information Technology Equipment — Safety — Part 1: General Requirements*, 2007.

2.3.5 Other Publications.

California Technical Bulletin 133, *Flammability Test Procedure for Seating Furniture for Use in Public Occupancies*, State of California, Department of Consumer Affairs, 1625 North Market Boulevard, Suite N-119, Sacramento, CA 95834.

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

Telcordia GR-63-CORE, *Network Equipment Building System (NEBS)™ Requirements: Physical Protection*, 2017.

2.4 References for Extracts in Mandatory Sections.

NFPA 1, *Fire Code*, 2018 edition.

NFPA 70®, National Electrical Code®, 2017 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2018 edition.

NFPA *101®, Life Safety Code®*, 2018 edition.

NFPA 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants*, 2015 edition.

NFPA 921, *Guide for Fire and Explosion Investigations*, 2017 edition.

NFPA 5000®, Building Construction and Safety Code®, 2018 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* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.4 Shall. Indicates a mandatory requirement.

3.2.5 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which 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 Abandoned Cables. Installed telecommunications, optical fiber, and electrical power cables that are not terminated at equipment and are not identified for future use.

N **3.3.2 Battery.**

N **3.3.2.1** ***Lithium-Ion Battery.*** A storage battery that consists of lithium-ions imbedded in a carbon graphite or nickel metal oxide substrate. The electrolyte is a carbonate mixture or a gelled polymer. The lithium-ions are the charge carriers of the battery. [**1,** 2018]

N **3.3.2.2** ***Nickel Cadmium (NiCd) Battery.*** An alkaline storage battery in which the positive active material is nickel oxide, the negative contains cadmium, and the electrolyte is potassium hydroxide. [**1,** 2018]

N **3.3.2.3** ***Sodium-Nickel Battery.*** A hermetically sealed storage battery that consists of a sodium negative electrode, a beta-alumina electrolyte, and a positive electrode of either nickel, nickel-chloride, or sodium-chloride. These batteries operate with an internal temperature over 500°F (260°C).

N **3.3.2.4*** ***Valve-Regulated Lead Acid (VRLA).*** A lead-acid battery consisting of sealed cells furnished with a valve that opens to vent the battery whenever the internal pressure of the battery exceeds the ambient pressure by a set amount.

N **3.3.2.5*** ***Vented (Flooded).*** A battery consisting of cells that have electrodes immersed in liquid electrolyte.

3.3.3 Building Automation System. An automated system used to control building functions such as HVAC control, lighting, and smoke management.

3.3.4 Cable Routing Assembly. A single channel or connected multiple channels, as well as associated fittings, forming a structural system that is used to support and route communications wires and cables, optical fiber cables, data cables associated with information technology and communications equipment, Class 2, Class 3, and Type PLTC cables, and power-limited fire alarm cables in plenum, riser, and general purpose applications. [**70:**100]

3.3.5 Cable Telecommunications. One- and two-way communications service provided over a network, generally through optical fiber or coaxial cable.