NFPA 72®

National Fire Alarm and Signaling Code®

2025 Edition

NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

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NFPA 72®

National Fire Alarm and Signaling Code®

2025 Edition

This edition of *NFPA 72, National Fire Alarm and Signaling Code*, was prepared by the Technical Committees on Emergency Communication Systems, Fundamentals of Fire Alarm and Signaling Systems, Single- and Multiple-Station Alarms and Household Signaling Systems, Initiating Devices for Fire Alarm and Signaling Systems, Notification Appliances for Fire Alarm and Signaling Systems, Protected Premises Fire Alarm and Signaling Systems, Public Emergency Reporting Systems, Supervising Station Fire Alarm and Signaling Systems, and Testing and Maintenance of Fire Alarm and Signaling Systems, released by the Correlating Committee on Signaling Systems for the Protection of Life and Property and acted on by the NFPA membership during the 2024 NFPA Technical Meeting held June 20, 2024. It was issued by the Standards Council on August 29, 2024, with an effective date of September 18, 2024, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See "Codes & Standards" at www.nfpa.org for more information.

This edition of *NFPA 72* was approved as an American National Standard on September 18, 2024.

Origin and Development of *NFPA 72*

The development of NFPA's signaling standards dates back to 1898 with the appointment of the Committee on Thermo-Electric Fire Alarms. The 1905 edition of NBFU 71A, *Rules and Requirements of the National Board of Fire Underwriters for the Construction, Installation, and Use of Signaling Systems Used for the Transmission of Signals Affecting the Fire Hazard as Recommended by the National Fire Protection Association*, and related documents dating back to 1903 were among the first of numerous signaling standards published in conjunction with the National Fire Protection Association. The descendants of these earlier standards were consolidated into the *National Fire Alarm Code, NFPA 72*.

The first edition of the *National Fire Alarm Code*, published in 1993, was a consolidation of the 1989 edition of NFPA 71, *Standard for the Installation, Maintenance, and Use of Signaling Systems for Central Station Service*; the 1990 edition of NFPA 72, *Standard for the Installation, Maintenance, and Use of Protective Signaling Systems*; the 1990 edition of NFPA 72E, *Standard on Automatic Fire Detectors*; the 1989 edition of NFPA 72G, *Guide for the Installation, Maintenance, and Use of Notification Appliances for Protective Signaling Systems*; the 1988 edition of NFPA 72H, *Guide for Testing Procedures for Local, Auxiliary, Remote Station, and Proprietary Protective Signaling Systems*; and the 1989 edition of NFPA 74, *Standard for the Installation, Maintenance, and Use of Household Fire Warning Equipment*. Many of the requirements of these standards were identical or very similar. The recommendations that were taken from the guides (NFPA 72G and NFPA 72H) were changed to mandatory requirements.

The 1996 edition of *NFPA 72* incorporated many changes of a technical nature. These changes related to the Americans with Disabilities Act, software testing, fire modeling, and communications.

The 1999 edition represented a major change in code content and organization. The chapters were arranged to facilitate user friendliness and provide a logical structure. A new chapter on public fire reporting was added, and many technical revisions were made. Annex B (formerly Appendix B) was streamlined to facilitate ease of use, many unenforceable terms were removed, and Chapter 3 was reorganized to facilitate a more logical approach.

The 2002 edition reflected an extensive editorial revision of the Code to comply with the latest edition of the *Manual of Style for NFPA Technical Committee Documents*. These revisions included the addition of three administrative chapters at the beginning of the Code: Administration, Referenced Publications, and Definitions. Eight technical chapters followed the administrative chapters in the same sequence as in the 1999 edition. Other editorial revisions included the breakout of paragraphs with multiple requirements into individually numbered paragraphs for each requirement, the minimization of use of exceptions, the use of consistent headings for sections and section subdivisions, and reorganization to limit paragraph numbering to six digits.

The 2002 edition contained a number of technical revisions throughout the Code, including the following:

(1) A major revision of the power supply requirements
(2) A new requirement addressing impairments to fire alarm systems
(3) Additional requirements concerning the review and approval of performance-based detection system designs
(4) Revision of the rules for system survivability from attack by fire
(5) The introduction of rules for an alternate approach for audible signaling
(6) The addition of requirements to address performance-based designs for visible signaling
(7) The relocation of testing and maintenance requirements for single- and multiple-station alarms and household fire alarm systems to the testing and maintenance chapter
(8) Revisions to re-establish the prescriptive rules for household fire-warning equipment from the 1996 edition of the Code

The 2007 edition contained several technical revisions including many to accommodate new technology and to take advantage of new research. Changes were made to better address the integration of mass notification systems and other systems with fire alarm systems. Revisions were also made in several areas of the Code for clarity and to enhance its usability.

Some of the more significant revisions in the 2007 edition addressed protection of fire alarm control units (FACUs), personnel qualifications, heat detector response time, smoke detector spacing, smoke detection in ducts, detectors that use multiple sensing inputs, video image smoke and flame detection, synchronization of visible notification appliances, exit marking audible notification appliances, tactile notification appliances, different types of protected premises fire alarm systems, and in-building enhancement systems for fire fighter radio communications. The 2007 edition also included significant changes to the requirements for smoke alarms in residential applications, revisions to require the interconnection of smoke alarms for existing occupancies, revisions to require additional smoke alarms for larger dwelling units, and revisions to allow voice messages to be included as a part of the smoke alarm notification signal.

Revisions in the 2007 edition to enhance and clarify the Code included those that address suppression system inputs to the fire alarm system, emergency/voice alarm communications systems, fire alarm system interface with elevator systems, and the means to indicate central station service. In addition, a complete revision of the record of completion form along with examples of filled-out forms were provided.

The 2007 edition also included the addition of two new annexes — one to provide guidance for the design of mass notification systems and one to replace previous annex material for the design of fire service interfaces with a separate industry standard.

The 2010 edition of the Code presented a major change in the scope and organization of the document. This was reflected in the new title, *National Fire Alarm and Signaling Code*. The broader scope of the Code included emergency communications systems (ECSs) in addition to the traditional scope of fire alarm systems. A new chapter on ECSs was added to provide requirements for a variety of systems used for communication of information in various emergency situations. The ECS chapter included new systems such as in-building mass notification systems, wide area mass notification systems, distributed recipient mass notifications systems, two-way radio communications enhancement systems, and area of refuge ECSs. The ECS chapter also included two systems formerly in the chapter on protected premises fire alarm systems: (in-building fire) emergency voice/alarm communications systems and two-way in-building wired (telephone) emergency services communication systems.

Two other new chapters were added in the 2010 edition. A new chapter on circuits and pathways included requirements and information formerly located in the chapters on fundamentals of fire alarm systems and the chapter on protected premises fire alarm systems. This new chapter provided circuit and pathway performance (class) designations and pathway survivability level designations as well as general wiring requirements presented in a format that allowed use by any type of system covered in the Code. The new chapter on emergency control functions and interfaces included requirements and information formerly contained in the chapter of protected premises fire alarm systems. In this chapter, the term *fire safety function* generally was replaced with the term *emergency control function* to reflect the potentially broader application beyond just fire alarm systems. This new chapter also included new provisions for first-responder-use elevators and elevators for occupant-controlled evacuation.

The 2010 edition was reorganized substantially to accommodate the new chapters in a logical order with reserved chapter numbers included to minimize the potential for further renumbering in the future. The overall organization included administrative chapters, support chapters, and system chapters as well as numerous annexes for usability.

Significant revisions were also made throughout the 2010 edition to reflect the broader application of the Code to ECSs. These included revisions in the chapter on fundamentals to address power supply requirements, signal priorities, signal distinction and documentation requirements; revisions to the protected premises chapter to better accommodate non-fire-alarm systems in combination systems; revisions to the supervising station chapter and public emergency reporting system chapter to allow their use for ECSs; and revisions to the testing and maintenance chapter to incorporate requirements for the inspection, testing, and maintenance of mass notification systems and two-way radio communications enhancement systems.

In addition to the content of the new chapters, the 2010 edition included significant technical changes. These included new requirements for signaling to the deaf and hard of hearing, new requirements and guidance for the design, installation, and testing of voice communications systems to ensure voice intelligibility, and extensive revision of requirements for the installation of smoke detectors in both level and sloped joist and beam ceiling applications.

Revisions to the supervising station chapter in the 2010 edition included the retirement of four legacy transmission technologies no longer being installed: active multiplex transmission systems, McCulloh systems, directly connected noncoded systems, and private microwave systems. The subsection on other transmission technologies was relocated to become the default subsection for supervising stations communications methods.

Modifications in the 2010 edition to the chapter on single- and multiple-station alarms and household fire alarms systems included new provisions to address the interconnection of smoke alarms using wireless technology, new provisions for signaling to those with hearing loss, and new requirements and guidance for the placement of smoke alarms and smoke detectors.

The 2010 edition included two new guidance annexes, Annex C on system performance and design and Annex D on speech intelligibility.

The 2013 edition of the Code was built on the organizational changes made in the 2010 edition. A new Chapter 7, Documentation, was added to improve the usability of the document and provided a central location for all the documentation requirements of the Code. In some cases, the documentation provisions were contained directly in the new chapter. In other cases, references were provided to the locations of documentation requirements contained in other chapters. As an example, the new chapter contained the minimum documentation requirements that applied to any system covered by the Code, while additional document requirements that might apply from other parts of the Code or from other governing laws, codes, or standards were listed with an appropriate reference. The record of completion and record of inspection, testing, and maintenance forms were included at the end of the chapter and were completely revised to be easier to use with a basic form for straightforward systems and supplemental forms for more complex systems.

Chapter 10, Fundamentals, was reorganized for the 2013 edition to provide a more user-friendly flow of requirements. In addition, requirements for circuit monitoring found in the previous edition of Chapter 10 were relocated to Chapter 12, Circuits and Pathways, a more logical location.

Extensive usability changes also were made in the inspection and testing tables of Chapter 14, Inspection, Testing, and Maintenance. The visual inspection table was updated, adding new inspection methods for each component along with the inspection frequency. The test methods and test frequency tables were combined into a single table so that the test method appeared along with the test frequency for each component. The component listings in both tables were reorganized and coordinated so that components and equipment were easier to find.

The 2013 edition of the Code also included many technical updates. Among those updates were changes in Chapter 10 requiring supervising station operators and fire alarm system service providers to report certain conditions of system impairment to the authority having jurisdiction. Requirements for inspection, testing, and service personnel qualifications were updated to better reflect the level of qualification needed for each type of activity.

Changes were also made in Chapter 18, Notification Appliances, requiring documentation of the locations that require audible notification appliances as well as documentation of the audibility levels that must be produced. Area of coverage requirements were added for visible notification appliances. Changes were made in Chapter 21, Emergency Control Function Interfaces, to address requirements for elevator recall when sprinklers are installed in elevator pits. The requirements for occupant evacuation elevators were completely revised to coordinate with changes made in ASME A17.1/B44, *Safety Code for Elevators and Escalators*. Changes were made in Chapter 24, Emergency Communications Systems (ECSs), to address the use of microphones and of textual and graphical visible notification appliances for primary or supplemental notification, and to update the requirements for emergency command centers. Changes were made in Chapter 26, Supervising Station Alarm Systems, to address alarm signal verification, alarm signal content, and restoration of signals. Those changes were made in part to help emergency responders better manage issues related to unwanted alarms. In addition, new definitions for unwanted alarms were added to more precisely identify the sources of such alarms. Changes were also made to update the communications methods addressed in Chapter 26. Among them were changes to the supervision interval requirements for communications paths and changes to the types of transmission means that can be used for the second channel of a digital alarm communicator transmitter (DACT). Changes were made in Chapter 29, Single- and Multiple-Station Alarms and Household Signaling Systems, to address the connection of sprinkler waterflow switches to multiple-station alarms and to add new requirements addressing the smoke alarm resistance to common nuisance sources.

The 2016 edition made many changes relative to documentation. Chapter 7 revised and added items to the minimum documentation, documentation for new ECSs, and software documentation requirements; and addressed review of electronic documentation media formats. Requirements for documentation of qualifications for the system designer and personnel who program systems were more clearly addressed while providing for the allowance for system design trainees. New criteria were added for plans examiners and inspectors.

Perhaps the most significant changes to the Code pertained to wiring. The 2016 edition added Class N, which addressed Ethernet infrastructures for alarm and signaling systems, and provided pathway performance and installation criteria. Class A and Class X pathway separation requirements were revised to address emergency control function interface devices controlled by the fire alarm system on those circuits. Level 2 and Level 3 pathway survivability requirements were revised, which provided flexibility of use and addressed other fire-resistive methods.

The 2016 edition of the Code added language relative to recalled equipment observed during inspection and testing and clarified the intent of periodic visual inspections relative to building or other changes that could affect the performance of the system. With the exception of reference and requirements pertaining to survivability, requirements for the design, installation, testing, and maintenance of in-building emergency radio communications enhancement systems were relocated to NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*.

Chapter 17 revised the requirements for total coverage and expanded its annex language to address general consideration for elevator shafts and enclosed stairways. The requirements for placement of smoke detectors used for door release were also revised to provide additional flexibility in locating detectors.

Chapter 24 was restructured, providing greater user friendliness while expanding the section on risk analysis. Emphasis was placed on the importance of effective message development. Annex G, Guidelines for Emergency Communication Strategies for Buildings and Campuses, which is based on the National Institute of Standards and Technology and Fire Protection Research Foundation research, was added to the 2016 edition.

Language was changed in Chapter 26 to require multiple communication paths used for performance-based technologies or two transmission means for a DACT to be arranged to avoid a single point of failure.

Chapter 29 added requirements pertaining to remote resetting and silencing of a FACU from other than the protected premises for a minimum of 4 minutes from the initial activation of the fire alarm signal. Smart phones and Internet access to almost any device made remote access to residential equipment possible. The ability to establish remote access to a fire alarm system was addressed. Also, a new requirement established that all equipment necessary to transmit an alarm signal must be provided with a minimum of 24 hours of secondary power capacity where a communication or transmission means other than DACT is used.

The 2019 edition reflected a number of changes. The requirements for fire service access elevators and occupant evacuation elevators (OEE) were completely revised to coordinate with changes made in ASME A17.1/CSA B44. The requirements for occupant evacuation operation (OEO) were revised extensively. Annex text, including a new figure, was added for clarification (elevator system interface with the building fire alarm system based on Section 2.27.11 of ASME A17.1 and Section 21.6 of *NFPA 72*). In addition to the requirements for area of refuge (area of rescue assistance), Chapter 24 was revised to include requirements for stairway communications systems, elevator landing communications systems, and occupant evacuation elevator lobby communications systems. A review was accomplished and revisions made to ensure alignment of *NFPA 72* with the *Manual of Style for NFPA Technical Committee Documents*. For many years, when codes required visual (or visible) notification in addition to audible notification, strobe lights meeting the requirements of Chapter 18 were used. With the availability of newer LED products that can be used for fire alarms, the terms *strobe*, *light*, and *visible* were essentially changed to *visual notification appliance*. The terms *speaker* and *high power speaker array (HPSA)* were changed to *loudspeaker* and *high power loudspeaker array (HPLA)* for consistency.

Perhaps the most significant change to the Code pertained to carbon monoxide. In August 2015, the Standards Council voted to relocate material from NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, to various chapters of *NFPA 72*. These requirements were incorporated into Chapter 17 for carbon monoxide detectors; Chapter 14 for installation, testing, and maintenance; Chapter 29 for carbon monoxide alarms; and a new Annex H, Carbon Monoxide. Chapter 29 was greatly expanded, and a significant amount of annex text was added for explanation. NFPA 720 was withdrawn as the requirements were moved to *NFPA 72*.

Chapter 14 was greatly modified to incorporate valve-regulated lead-acid (VRLA) batteries. Inspection and testing requirements were revised in Table 14.3.1 and Table 14.4.3.2. Annex language was also expanded to address use and testing of such batteries. Several new terms were introduced and defined in Chapter 3.

The 2022 edition provided a new Chapter 11, Cybersecurity, and a new Annex J, Guidelines for Cybersecurity. These provided criteria and guidance for protection of fire alarm and signaling systems from cyberattacks.

A new Annex I, Color-Coded Tagging Program, introduced a green, yellow, and red color-coded tagging program that provided "at a glance" details of the apparent condition of the fire alarm and signaling system. Tagging is a common visual system in place in many states and jurisdictions.

Another area of focus pertained to pathway survivability, defined as "the ability of any conductor, optical fiber, radio carrier, or other means for transmitting system information to remain operational during fire conditions." For many applications, pathway survivability is required to ensure that the conducting means between Point A (e.g., FACU) and Point B (i.e., the notification area) is not compromised by a fire somewhere along that path such that notification is impaired. The Code defined four levels of survivability and established which level is required for a given application. One level might require

interconnecting conductors, cables, or other physical pathways to be protected by metal raceways or metal armored cables, while another level might require a 2-hour fire-rated circuit integrity (CI) or fire-resistive cable, fire-rated cable system [electrical circuit protective system(s)], fire-rated enclosure or protected area, or other performance alternative. The 2022 edition of the Code provided a fifth option that reduces the 2-hour rated application criteria to 1-hour rated application criteria; Chapter 24 provided specific requirements that must be followed to enable use of the 1-hour application.

A major addition to the 2022 edition of the Code pertained to remote access to fire alarm and signaling systems for operations that could include resetting, silencing, or operation of emergency control functions. Remote access is permitted to be enabled remotely to perform diagnostics and update software.

Numerous changes to several areas within the Code affected detector technology and methods. Photoelectric and ionization detectors will likely be relegated to history and replaced with newer technology single- or multiple-criteria detectors. These detectors will lead to a paradigm shift in vocabulary and operation and will provide greater resistance to false triggers.

The 2025 edition expands the requirements in Chapter 11 and incorporates the information previously contained in Annex J, which has been deleted. The revised language and annex material clarify requirements for the protection of fire alarm and signaling systems from cyber attacks.

Chapter 17 addresses the emerging technology of acoustic leak detectors and thermal image fire detectors. Acoustic leak detectors work by detecting the sound produced by a pressurized gas release. Thermal image fire detectors are different from non-imaging radiant energy detectors that were previously included in the Code.

The spacing of smoke detectors has been clarified to be unchanged on ceilings up to 40 ft (12.2 m) in height, after which performance-based design spacing must be used.

A new notification mode, restricted audible mode operation (RAMO), recognizes the need for notification options in areas where loud sounds might be detrimental to typical occupants of the notification zones, such as facilities that service people with autism spectrum disorder, neurodiverse individuals, or other occupants with sensitivity to sound, light, or other stimuli. The new mode permits a RAMO notification zone to apply private mode audible levels.

Detailed instructions for the calculations of voltage drop in DC-power-sourced notification appliance circuits and circuit loss in AC-power-sourced notification appliance circuits have been provided to standardize the calculation procedure in Chapter 18.

Chapter 26 contains significant changes related to auxiliary service providers (ASPs) and communications technologies. The new section on ASPs ensures that fire protection signals that pass from the protected premises through the ASPs servers are processed in a reliable and supervised manner and do not bypass the supervising station. Changes to the communications technologies requirements begin to address the new technical advancements and a variety of methods of transmitting and processing important fire alarm system signals to supervising stations while providing continued recognition of legacy transmitting methods still in use. The revisions are intended to address changes that reflect both existing and performance-based technologies considered reasonably reliable and acceptable for the important task of transmitting fire alarm signals to supervising stations and ultimately for notification of and action by emergency response agencies.

Chapter 29 now directs the user to NFPA 715, *Standard for the Installation of Fuel Gases Detection and Warning Equipment*, for fuel gas detection. The requirements for notification of persons with hearing loss, the elderly, school age children, and impaired persons have been simplified to provide 520 Hz notification appliances or tactile notification appliances. Smoke alarm spacing relative to cooking appliances has been substantially changed to consider smoke alarms listed for resistance to nuisance sources.

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Committee Scope: This Committee shall have primary responsibility for documents on the installation, performance, maintenance, testing, and use of signaling components and signaling systems for the protection of life, property and mission continuity.

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Scott D. Carlson, Fire Defense Equipment Company, Inc., MI [IM]

Louis Chavez, UL LLC, IL [RT]

Franklin Chenoweth, Fireline Corporation, MD [M]
Rep. Fire Suppression Systems Association

Jack P. Coffelt, ServiceTrade/Asurio, NC [M]
Rep. National Fire Sprinkler Association

Scott D. Corrin, C T Services, CA [SE]

Rick Heffernan, SDi, NJ [M]
Rep. National Electrical Manufacturers Association

Herbert B. Hurst, Jr., Savannah River Nuclear Solutions, LLC, SC [U]

Bill Isemann, Guardian Fire Protection Services LLC, MD [IM]
Rep. National Association of Fire Equipment Distributors

E. J. Kleintop, Johnson Controls, PA [M]

Peter A. Larrimer, US Department of Veterans Affairs, PA [U]

Joshua P. McDonald, American Fire Sprinkler Association (AFSA), TX [IM]

Grady Medcalf, Comcast, FL [IM]
Rep. Electronic Security Association

Daniel Morrin, Jr., NECCO Security Company Inc., PA [M]
Rep. Automatic Fire Alarm Association, Inc.

James Murphy, Vector Security Inc., PA [IM]
Rep. The Monitoring Association

Katherine A. Pothier, Fisher Engineering, Inc., GA [SE]

Christopher Rawson, International Brotherhood of Electrical Workers (IBEW), IL [L]
Rep. International Brotherhood of Electrical Workers

Joe Scibetta, BuildingReports, GA [M]

Michael J. Slattery, AFA Protective Systems, Inc., MA [IM]

Timothy M. Soverino, Nantucket, MA [U]
Rep. International Municipal Signal Association

Charles K. Stormer, US General Services Administration, IL [U]
Rep. US General Services Administration

Brad Stroud, Texas Instruments, Inc., TX [U]

Alternates

Paul Akins, Davis Ulmer Fire Protection, NY [IM]
(Alt. to Bill Isemann)

Scott Bailey, Koorsen Fire & Security, IN [M]
(Alt. to Franklin Chenoweth)

Shane Courbier, Gentex Corporation, MI [M]
(Alt. to Rick Heffernan)

John August Denhardt, American Fire Sprinkler Association (AFSA), TX [IM]
(Alt. to Joshua P. McDonald)

Matthew Jackson, AFA Protective Systems Inc., NJ [IM]
(Alt. to Michael J. Slattery)

Neal Kelly, Fire Defense Equipment Company, Inc., MI [IM]
(Alt. to Scott D. Carlson)

Brian Patrick Kirtley, Comcast Xfinity Home, TX [IM]
(Alt. to Grady Medcalf)

Ariana Kistner, City of Rockwall Fire Department, TX [E]
(Voting Alt.)

Peter Leszczak, US Department of Veterans Affairs, CT [U]
(Alt. to Peter A. Larrimer)

Tammy Mayo, Telgian, AZ [M]
(Alt. to Daniel Morrin, Jr.)

Troy O'Neal, Siemens, TX [M]
(Alt. to Anthony Bloodworth)

Vincent Powers, National Fire Sprinkler Association (NFSA), MD [M]
(Alt. to Jack P. Coffelt)

Steven Criag Schwartz, Consolidated Fire Protection, CA [IM]
(Alt. to John CC Biggs)

Michael D. Sides, Global Asset Protection Services, LLC, FL [I]
(Alt. to Charles E. Brockett)

Je Weon Sung, US General Services Administration, WA [U]
(Alt. to Charles K. Stormer)

Patrick Bakaj, NFPA Staff Liaison

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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 and requirements for the inspection, testing, and maintenance of fire alarm and signaling systems and associated components, for both new and existing systems. This Committee shall not have responsibility for inspection, testing, and maintenance of single- and multiple-station alarms and household signaling systems.

Technical Committee on Supervising Station Fire Alarm and Signaling Systems

Daniel J. O'Connor, *Chair*
JENSEN HUGHES, IL [SE]

Raymond E. Bigelow, Medway, MA [U]
Rep. International Municipal Signal Association

Art Black, Carmel Fire Protection, CA [E]

Richard M. Bryant, Fox Valley Fire & Safety Company, IL [IM]

Christopher Creamer, UL LLC, IL [RT]

Robert Deardorff, FM Approvals, MA [I]

Pamela DeMeo, North Collier Fire, FL [E]

Jason Dupuis, Cintas Fire Protection F19, CA [M]
Rep. Automatic Fire Alarm Association, Inc.

Donald Fess, Harvard University, MA [U]

Leonard Hanna, Aes Corporation, MA [M]

Richard G. Kluge, Ericsson, NJ [U]
Rep. Alliance for Telecommunications Industry Solutions

Scott M. May, Bosch Security Systems, NY [M]
Rep. National Electrical Manufacturers Association

Matthew J. Mertens, North Shore Fire Department, WI [E]

Anthony Mucci, Johnson Controls, FL [IM]
Rep. The Monitoring Association

Scott Newman, Walgreens, IL [U]

Warren E. Olsen, Fire Safety Consultants, Inc., IL [E]
Rep. Illinois Fire Inspectors Association

Richard Jay Roberts, Honeywell Fire Safety, IL [M]

Michael G. Slossar, Amazon/Ring, NJ [U]
Rep. Electronic Security Association

Sean P. Titus, Fike Corporation, MO [M]
Rep. Fire Suppression Systems Association

Leo J. Watts, Signal Communications Corporation, MA [M]

Joshua David Wingfield, Keltron Corporation, MA [M]

Iman Yavari, LRI Engineering Inc, Fire Protection and Building Code Engineers, Canada [SE]

Alternates

Shane M. Clary, Bay Alarm Company, CA [M]
(Alt. to Jason Dupuis)

Martin J. Farraher, Siemens Industry, Inc., IL [M]
(Alt. to Sean P. Titus)

Laurie Licavoli, Pattonville Fire District, MO [E]
(Alt. to Pamela DeMeo)

Charles Mason, JENSEN HUGHES, RI [SE]
(Alt. to Daniel J. O'Connor)

Thomas J. Parrish, Telgian Corporation, MI [U]
(Voting Alt.)

Steven P. Sargent, Keltron Corporation, MA [M]
(Alt. to Joshua David Wingfield)

Randy H. Schubert, Ericsson, NJ [U]
(Alt. to Richard G. Kluge)

Michael Sherman, AES Corporation, MA [M]
(Alt. to Leonard Hanna)

Kile Unterzuber, Protective Resources, Inc., NC [IM]
(Voting Alt.)

Deane E. Walker, Grayslake Fire Protection District, IL [E]
(Alt. to Warren E. Olsen)

Patrick Bakaj, NFPA Staff Liaison

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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 the installation and operation of equipment for the transmission and receipt of signals from a protected premises to a supervising station, including the supervising station facilities.

Technical Committee on Public Emergency Reporting Systems

Leo F. Martin, Jr., *Chair*
Martin Electrical Code Consultants, MA [SE]

Robert E. Lapham, *Secretary*
Signal Communications Corporation, MA [M]

Leo J. Watts, *Secretary (Alternate)*
Signal Communications Corporation, MA [M]
(Alt. to Robert E. Lapham)

Douglas M. Aiken, Lakes Region Mutual Fire Aid, NH [E]
Anthony W. Cole, Wal-Mart Stores, Inc., CA [U]
Michael Scott Custer, Fort Detrick Fire Department, MD [E]
Daniel R. Dinwiddie, L W Bills Company, MA [M]
Romeo G. Dupuis, Manchester VA Hospital, NH [U]
Donald Gottfried, New York City Department of Buildings, NY [E]
Samuel Iannucci, Chubb Group of Insurance Companies, PA [I]
Brian Patrick Kirtley, Comcast Xfinity Home, TX [IM]
Rep. Electronic Security Association
Jeffrey G. Knight, City of Newton Fire Department, MA [U]
Rep. International Municipal Signal Association
Gregory D. Lapin, Digital Design Laboratories, IL [SE]
Max McLeod, Siemens Industry, Inc., AL [M]
Robert E. Myers, MC Dean, VA [IM]
Isa Y. Saah, GHD, VA [SE]
Ryan Sandler, ADT Commercial LLC/Red Hawk Fire Security, CA [M]
Rep. Automatic Fire Alarm Association, Inc.
Deborah L. Shaner, Shaner Life Safety, CO [SE]
Stephen Smith, Advanced Signal Corporation, MA [IM]
Thomas R. Waldron, Coffman Engineers, CA [SE]
Christopher Willms, Sea Girt Fire Company #1, NJ [E]

Alternates

Hans Kristensen, Woodstock Fire/Rescue Department, IL [U]
(Alt. to Jeffrey G. Knight)
Rodger Reiswig, Johnson Controls, VA [IM]
(Alt. to Brian Patrick Kirtley)
Ellen Salib, Siemens, NJ [M]
(Alt. to Max McLeod)
David Michael Szymanski, Ahern Fire Protection, WI [M]
(Alt. to Ryan Sandler)

Patrick Bakaj, NFPA Staff Liaison

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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 the proper configuration, performance, installation, and operation of public emergency alarm reporting systems and auxiliary alarm systems. The Committee scope shall include systems that use a communication infrastructure that is publicly owned, operated, and controlled. Reporting of alarms by voice over the public switched telephone network utilizing the Universal Emergency Number 9-1-1, or any other telephone number that can be dialed, is outside the scope of this committee.

Technical Committee on Protected Premises Fire Alarm and Signaling Systems

Jack Poole, *Chair*
Poole Fire Protection, Inc., KS [SE]

Leonard Belliveau, Jr., *Secretary*
Protection Engineers, LLC, MA [SE]

Christopher Mark Barrieau, Johnson Controls, MA [M]
Donald C. Birchler, FP&C Consultants KC, LLC, MO [SE]
Robert Bourke, Wayne Alarm Systems, MA [IM]
Rep. The Monitoring Association
Merton W. Bunker, Jr., Merton Bunker & Associates, LLC, VA [SE]
Eric Camiel, JENSEN HUGHES, MA [SE]
Robert Cole, Intertek Testing Services, GA [RT]
Rep. Intertek Testing Services
David Correia, Honeywell International, CT [M]
Rep. National Electrical Manufacturers Association
Laura E. Doyle, US General Services Administration, DC [U]
Steven T. Dunham, Midwest Alarm Services, IA [IM]
Paul M. Dwyer, FM Approvals, MA [I]
Peter M. Goldring, Goldring Protection, NJ [IM]
Scott D. Harris, AFA Protective Systems, Inc., NY [IM]
William K. Hopple, Hopple & Company, CA [IM]
Daniel J. Horon, CADgraphics, Incorporated, FL [M]
Brian Jarvis, US Department of Defense, AE [U]
Paul T. Kahle, Code Consultants, Inc., MO [SE]
Jeffrey M. Klein, Potter Electric Signal Company, MO [M]
Peter Leszczak, US Department of Veterans Affairs, CT [U]
Scott T. Martorano, The Viking Corporation, MI [M]
Rep. National Fire Sprinkler Association
Jebediah J. Novak, Cedar Rapids Electrical JATC, IA [L]
Rep. International Brotherhood of Electrical Workers
Todd Marc Pearson, SLS Consulting, LLC, MA [SE]
Christopher Russell, Security Solutions NW, WA [IM]
Rep. Electronic Security Association
Allan P. Sanedrin, UL LLC, IL [RT]
Frank Savino, United Fire Protection Corporation, NJ [M]
Rep. Fire Suppression Systems Association
Donald Struck, Siemens Fire Safety, NJ [M]
Jeffery G. Van Keuren, Edwards/Carrier, FL [M]
Rep. Automatic Fire Alarm Association, Inc.
Sagiv Weiss-Ishai, San Francisco Fire Department, CA [E]
Carl F. Willms, Fire Safety Consultants, Inc., NJ [SE]

Alternates

Vincent Baroncini, Siemens, Inc., NJ [M]
(Alt. to Donald Struck)
Martin Chiarizio, Johnson Controls, MA [M]
(Alt. to Christopher Mark Barrieau)
Brett W. Christianson, FP&C Consultants KC, LLC, MO [SE]
(Alt. to Donald C. Birchler)
Joseph Dafin, US General Services Administration, MD [U]
(Alt. to Laura E. Doyle)
Joshua W. Elvove, Self, CO [SE]
(Alt. to Carl F. Willms)
Jacob P. Hemke, Code Consultants, Inc., MO [SE]
(Alt. to Paul T. Kahle)
Theodore Ivers, UL LLC, NY [RT]
(Alt. to Allan P. Sanedrin)
Walter J. Kessler, Jr., FM Approvals, MA [I]
(Alt. to Paul M. Dwyer)
Tim Knisely, Automatic Fire Alarm Association, Inc. (AFAA), PA [M]
(Alt. to Jeffery G. Van Keuren)
Mark LaBua, AFA Protective Systems Inc., NY [IM]
(Alt. to Scott D. Harris)
Peter A. Larrimer, US Department of Veterans Affairs, PA [U]
(Alt. to Peter Leszczak)
Andre Lickefett, Minimax GmbH, Germany [M]
(Alt. to Scott T. Martorano)
Michael McIsaac, Potter Electric Signal Company, MN [M]
(Alt. to Jeffrey M. Klein)
Christian Pierson, US Department of State, MD [U]
(Alt. to Brian Jarvis)
Lou Richard, Comcast, PA [IM]
(Alt. to Christopher Russell)
Larry D. Rietz, JENSEN HUGHES, CO [SE]
(Alt. to Eric Camiel)
Sean P. Titus, Fike Corporation, MO [M]
(Alt. to Frank Savino)
Michael Jered Yanofsky, Honeywell, CT [M]
(Alt. to David Correia)

Patrick Bakaj, NFPA Staff Liaison

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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 the installation and operation of protected premises fire alarm and signaling systems, including their interconnection with initiating devices, notification appliances, and other related building control equipment, within the protected premises.

Technical Committee on Notification Appliances for Fire Alarm and Signaling Systems

Andrew W. Poole, *Chair*
Poole Fire Protection, Inc., KS [SE]

Robert F. Accosta, Jr., Arup, NY [SE]
Cory Blair, Genesis Building Systems, OH [IM]
Jan Braam, Carrier, FL [M]
Rep. Carrier/UTC
Matthew Buehrer, Buehrer Alarm Systems Consulting LLC, AZ [IM]
Rep. Electronic Security Association
Terry W. Davis, Lubbock Fire Marshals Office, TX [E]
Tyler Drage, Front Range Fire Rescue, CO [E]
David Dressler, Minnesota Statewide Limited Energy JATC, MN [L]
Rep. International Brotherhood of Electrical Workers
Michael L. Edwards, US Architect of the Capitol, DC [U]
Reese Freeman, James Lane Fire Protection, TX [IM]
Rep. National Association of Fire Equipment Distributors
Paul Jennison, Forsyth County Georgia, GA [U]
Doug Kline, Nowak Supply Fire Systems, IN [M]
Rep. Fire Suppression Systems Association
Timothy J. Lawyer, JENSEN HUGHES, CA [SE]
Steven P. Lewis, RFI Enterprises, CA [IM]
David Madole, University of Texas at Austin, TX [U]
Bob D. Morgan, Fort Worth Fire Department, TX [E]
Christopher Moye, Guardian Security Systems, WA [M]
Rep. Automatic Fire Alarm Association, Inc.
David Newhouse, Gentex Corporation, MI [M]
Rep. National Electrical Manufacturers Association
Isaac I. Papier, Papier Consulting Group LLC, IL [SE]
Maurice M. Pilette, Mechanical Designs Ltd., MA [SE]
Robert P. Schifiliti, R. P. Schifiliti Associates, Inc., MA [SE]
Michael T. Schmitt, Illinois Fire Inspectors Association (IFIA), IL [E]
Paul R. Strelecki, Siemens Building Technologies, Inc., NJ [M]
John R. Swanson, National Fire Sprinkler Association (NFSA), MN [M]
John William Wilkus, US Army Corps of Engineers, KS [U]

Alternates

Chase A. Browning, Medford Fire Department, OR [M]
(Alt. to John R. Swanson)
Maxwell French, Code Red Consultants, MA [SE]
(Alt. to Maurice M. Pilette)
Raymond A. Grill, Ray Grill Consulting PLLC, VA [SE]
(Alt. to Robert F. Accosta, Jr.)
Mark C. Hamilton, Siemens, Inc., NJ [M]
(Alt. to Paul R. Strelecki)
Mark Murrell, Hiller Companies, AZ [IM]
(Alt. to Reese Freeman)
Leon Newsome, Eaton Corporation, FL [M]
(Alt. to David Newhouse)
Warren E. Olsen, Fire Safety Consultants, Inc., IL [E]
(Alt. to Michael T. Schmitt)
Scott E. Panowitz, BFPE International, MD [M]
(Alt. to Doug Kline)
Jack Poole, Poole Fire Protection, Inc., KS [SE]
(Alt. to Andrew W. Poole)
Brian Robertson, Comcast, FL [IM]
(Alt. to Matthew Buehrer)
Morris L. Stoops, Carrier, KS [M]
(Alt. to Jan Braam)
Sheryl A. Tricocci, Johnson Controls, GA [M]
(Alt. to Christopher Moye)

Patrick Bakaj, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on the installation and operation of notification appliances for fire alarm and signaling systems.

Technical Committee on Initiating Devices for Fire Alarm and Signaling Systems

Laurence J. Dallaire, *Chair*
Amazon Web Services, VA [U]

Justin D. Merrick, *Secretary*
S&S Sprinkler Company, LLC, AL [IM]

Alhassan Kamel Taha Ahmed, WSP Middle East, Saudi Arabia [SE]
Wayne J. Aho, Jr., Siemens, Industry Inc., NJ [M]
Shar Beddow, Greater Naples Fire Dept/LCFMA, FL [E]
Mark S. Boone, AEGIS Insurance Services Limited, NJ [U]
Rep. Edison Electric Institute
Michael James Brennan, RSCC Wire and Cable LLC, IL [M]
Rep. National Electrical Manufacturers Association
John M. Cholin, J. M. Cholin Consultants Inc., NJ [SE]
John August Denhardt, American Fire Sprinkler Association (AFSA), TX [IM]
Scott A. Frazer, Performance Design Technologies, TN [SE]
James W. Gaut, Marriott Vacations Worldwide, FL [U]
Jim Goggin, Protectowire Company, Inc., MA [M]
Todd Gustafson, Mircom Group Of Companies, IL [M]
Rep. Automatic Fire Alarm Association, Inc.
Marty Heller, Shambaugh and Son, IN [M]
Rep. National Fire Sprinkler Association
Noel Hernberger, Electrical JATC for Soouthern Nevada, NV [L]
Rep. International Brotherhood of Electrical Workers
Mark Hopkins, TERPconsulting, MD [SE]
Alex Keller, Fire Protection Specialists, WI [IM]
Rep. National Association of Fire Equipment Distributors
Fahad Khan, Summit Fire Consulting, TX [SE]
Kelly M. Kidwell, Smithsonian Institution, MD [U]
Scott R. Lang, Honeywell International, IL [M]
Matthew Lausch, JENSEN HUGHES, VA [SE]
Larry W. Mann, Central Station, Inc., AL [IM]
Rep. Electronic Security Association
Chris Marrion, Marrion Fire & Risk Consulting PE, LLC, NY [SE]
Samuel M. Miller, BP America Inc., TX [U]
James W. Mottorn, II, Bosch Security Systems, NY [M]
Abhay Nadgir, Carrier/Kidde-Fenwal, Inc., MA [M]
Rep. Fire Suppression Systems Association
David M. Nelson, Volunteer Technology Systems, TN [IM]
Rep. National Independent Fire Alarm Distributors Assn.
Lynn Nielson, City of Henderson, NV [E]
Samuel Rokowski, Maddox Electric Company, Inc., FL [IM]
Mohammed A. Saeefan, Saudi Aramco, Saudi Arabia [U]
Raja Sajad Hussain, SHE Fire Safety Consultancy, United Arab Emirates [SE]
Kenneth R. Schneider, UA - ITF, MO [L]
Rep. United Assn. of Journeymen & Apprentices of the Plumbing & Pipe Fitting Industry
Michael D. Sides, Global Asset Protection Services, LLC, FL [I]
Mark Swerdin, Zurich Services Corporation, NY [I]
Nicole Thomson, State of Alaska, FL [E]
David Waite, FM Approvals, MA [I]
Jason E. Webb, Potter Electric Signal Company, MO [M]

Alternates

Scott Bailey, Koorsen Fire & Security, IN [M]
(Alt. to Abhay Nadgir)
Charles Berra, Sprinkler Fitters LU 268 JAC, MO [L]
(Alt. to Kenneth R. Schneider)
Cecil Bilbo, Jr., Academy of Fire Sprinkler Technology, Inc., IL [M]
(Alt. to Marty Heller)
Charles E. Brockett, AXA XL Risk Consultancy/ Global Asset Protection Services, LLC, TX [I]
(Alt. to Michael D. Sides)
Wilson W. Cheung, Potter Electric Signal Company, MO [M]
(Alt. to Jason E. Webb)
Tommy L. Farr, JATC of Southern Nevada, NV [L]
(Alt. to Noel Hernberger)
Kevin Ryan Hall, American Fire Sprinkler Association (AFSA), MD [IM]
(Voting Alt.)
Robert Kasiski, FM Global, RI [I]
(Alt. to David Waite)
Henry J. Kozlowski, Zurich Services Corporation, RI [I]
(Alt. to Mark Swerdin)
Chad Austin Maddox, Maddox Electric Company, Inc., FL [IM]
(Alt. to Samuel Rokowski)
Grady Medcalf, Comcast, FL [IM]
(Alt. to Larry W. Mann)
David E. Mills, UL LLC, IL [RT]
(Voting Alt.)
Travis Nelson, Jensen Hughes Associates, Inc., TX [SE]
(Alt. to Matthew Lausch)
Mark F. Platfoot, Performance Design Technologies, TN [SE]
(Alt. to Scott A. Frazer)
Craig Schraad, Keller Fire & Safety, KS [IM]
(Alt. to Alex Keller)
Michael Stone, Johnson Controls, NH [M]
(Alt. to Michael James Brennan)
Brian E. Swanick, Siemens Industry, Inc., NJ [M]
(Alt. to Wayne J. Aho, Jr.)

Patrick Bakaj, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on the installation and operation of initiating devices for fire alarm and signaling systems.

Technical Committee on Single- and Multiple-Station Alarms and Household Signaling Systems

Cory Ogle, *Chair*
Code Consultants, Inc., MO [SE]

David E. Christian, *Secretary*
Gentex Corporation, MI [M]
Rep. Automatic Fire Alarm Association, Inc.

Richard Jay Roberts, *Nonvoting Secretary*
Honeywell Fire Safety, IL [M]
Rep. Automatic Fire Alarm Association, Inc.
(Alt. to David E. Christian)

George Bish, Amazon/Ring Protect Inc., NC [M]
Thomas G. Cleary, National Institute of Standards & Technology (NIST), MD [RT]
Timothy K. Dedear, City of Farmers Branch Fire Department, TX [E]
Wendy B. Gifford, Consultant, IL [SE]
Daniel T. Gottuk, Gottuk Engineering, MD [SE]
Greg L. Hansen, Vivint Inc., UT [M]
Matthew Jakusz, ADT LLC, FL [M]
Jeffery P. McBride, EBL Engineers, LLC, MD [SE]
Thomas H. Miller, Hansen Engineering Services, IL [SE]
David E. Mills, UL LLC, IL [RT]
Paul Murphy, Borough Of Atlantic Highlands, NJ [E]
Jeffrey L. Okun, Nuko Security, Inc., LA [IM]
Stephen M. Olenick, Combustion Science & Engineering, Inc., MD [SE]
Larry Ratzlaff, Carrier/Kidde Safety, IL [M]
Eric Sacco, Siemens Building Technologies Division, NJ [M]
Rep. National Electrical Manufacturers Association
Robert A. Schmidt, Marriott International, Inc., MD [U]
Richard M. Simpson, Vector Security Inc., PA [IM]
Rep. The Monitoring Association
Walter W. Wray, Miami-Dade Fire Rescue HQ, FL [E]

Alternates

Brian Cohen, Marriott, MD [U]
(Alt. to Robert A. Schmidt)
Rick Heffernan, SDi, NJ [M]
(Alt. to Eric Sacco)
Nasir Hussain, Combustion Science & Engineering, Inc., MD [SE]
(Alt. to Stephen M. Olenick)
Paul T. Kahle, Code Consultants, Inc., MO [SE]
(Alt. to Cory Ogle)
Tyler W. McCurdy, Amazon/Ring Protect, Inc., UT [M]
(Alt. to George Bish)
Keith Mirra, Vector Security Inc., MD [IM]
(Alt. to Richard M. Simpson)
Kim R. Mniszewski, FX Engineering, Inc., IL [SE]
(Alt. to Thomas H. Miller)
Ken Mott, Carrier/UTC/Kidde Safety, CO [M]
(Alt. to Larry Ratzlaff)
Timothy A. Rader, ADT Security Services, Inc., FL [M]
(Alt. to Matthew Jakusz)
Steven Wardle, Vivint Inc., UT [M]
(Alt. to Greg L. Hansen)

Nonvoting

Arthur S. Lee, US Consumer Product Safety Commission, MD [C]
Rep. US Consumer Product Safety Commission (CPSC)
Maurice M. Pilette, Mechanical Designs Ltd., MA [SE]
Rep. TC on Residential Sprinkler Systems

Patrick Bakaj, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on the performance, installation, operation, inspection, testing, maintenance, and use of single- and multiple-station alarms and household signaling systems.

Technical Committee on Fundamentals of Fire Alarm and Signaling Systems

David O. Lowrey, *Chair*
City of Boulder Fire Rescue, CO [E]
Rep. Fire Marshal's Association of Colorado

Kimberly A. Gruner, *Secretary*
Fike Corporation, MO [M]
Rep. Fire Suppression Systems Association

Ed Vaillancourt, *Nonvoting Secretary*
E & M International, Inc., NM [M]
Rep. Fire Suppression Systems Association
(Alt. to Kimberly A. Gruner)

Zainul Abedeen, WSP Middle East, United Arab Emirates [SE]

Laura Bennett-Hourigan, Walt Disney World Parks & Resorts, FL [U]

Andrew G. Berezowski, Honeywell Inc., CT [M]
Rep. National Electrical Manufacturers Association

Brian Boeglin, Comcast Xfinity Home, CA [IM]
Rep. Electronic Security Association

Robert A. Bonifas, Alarm Detection Systems, Inc., IL [IM]
Rep. The Monitoring Association

Shane M. Clary, Bay Alarm Company, CA [IM]

Manuelita E. David, JENSEN HUGHES, CA [SE]

Daniel G. Decker, Safety Systems, Inc., MI [IM]

William Denney, Hochiki America Corporation, CA [M]

James DiTaranto, Commercial Electrical Systems, FL [IM]

Myron Lee Draper, US Department of Veterans Affairs, MD [U]

Tommy L. Farr, JATC of Southern Nevada, NV [L]
Rep. International Brotherhood of Electrical Workers

David W. Frable, US General Services Administration, IL [U]

Kevin M. Green, Pyro-Comm Systems, Inc., CA [IM]

Paul Hail, Saudi Aramco, AK [U]

Jeffrey S. Hancock, Valero, TX [U]

John Houlihan, Fire Command Systems, Inc., MA [M]
Rep. Automatic Fire Alarm Association, Inc.

Husam Adnan Innabi, AAENGCO/FSEC, MI [SE]

Scott Jacobs, ISC Electronic Systems, Inc., CA [IM]

Bill Johns, P.E., Los Angeles City Fire Department, CA [E]

Jon Kapis, Coffman Engineers, CA [SE]

Walter J. Kessler, Jr., FM Approvals, MA [I]

Fred Leber, AML Encore Corporation, Canada [SE]

Richard A. Malady, Fire Fighter Sales & Service Company, PA [IM]
Rep. National Association of Fire Equipment Distributors

Michael Marchi, Miami-Dade Fire Rescue Department, FL [E]

Charlie McDaniel, AXA XL Risk Consultants/Global Asset Protection Services, LLC, WV [I]
Rep. Global Asset Protection Services, LLC

Nicholas Moriarty, Code Unlimited, NV [SE]

James M. Mundy, Jr., Asset Protection Associates, Ltd., NY [SE]

Thomas F. Norton, Norel Service Company, Inc., MA [IM]
Rep. US Naval Historical Center

James R. Richardson, Lisle Woodridge Fire District, IL [E]

John R. Schertel, Jr., Bosch Security Systems, LLC, MI [M]

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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 common system fundamentals for fire alarm and signaling systems, requirements for approvals, power supplies, equipment performance, system documentation, and compatibility.

Technical Committee on Emergency Communication Systems

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Patrick Bakaj, NFPA Staff Liaison

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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 the risk analysis, design, application, installation, and performance of emergency communications systems and their components. Public emergency services communications systems covered by NFPA 1221 are outside the scope of this committee except where they interface with in-building bi-directional amplifiers and where trouble and supervisory signals are intended to be monitored by the building fire alarm system.

Contents

NFPA 72

National Fire Alarm and Signaling Code®

2025 Edition

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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 J.

Chapter 1 Administration

1.1 Scope.

1.1.1 *NFPA 72* covers the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire and carbon monoxide detection and warning equipment, and emergency communications systems (ECS), and their components.

1.1.2 The provisions of this chapter apply throughout the Code unless otherwise noted.

1.1.3 For the purposes of carbon monoxide detection, this standard is primarily concerned with life safety, not property protection.

1.2* Purpose.

1.2.1 The purpose of this Code shall be to define the means of signal initiation, transmission, notification, and annunciation; the levels of performance; and the reliability of the various types of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire and carbon monoxide detection and warning equipment, emergency communications systems, and their components.

1.2.2 This Code defines the features associated with these systems and also provides information necessary to modify or upgrade an existing system to meet the requirements of a particular system classification.

1.2.3 This Code establishes minimum required levels of performance, extent of redundancy, and quality of installation but does not establish the only methods by which these requirements are to be achieved.

1.2.4* This Code shall not be interpreted to require a level of protection that is greater than that which would otherwise be required by the applicable building or fire code.

1.3 Application.

1.3.1 Alarm systems shall be classified as follows:

(1) Fire alarm systems
  (a) Household fire alarm systems
  (b) Protected premises (local) fire alarm systems
(2) Carbon monoxide detection equipment and systems
  (a) Single and multiple station carbon monoxide alarms
  (b) Carbon monoxide detectors and their related systems and components
(3) Supervising station alarm systems
  (a) Central station (service) alarm systems
  (b) Remote supervising station alarm systems
  (c) Proprietary supervising station alarm systems
(4) Public emergency alarm reporting systems

1.3.2 Emergency communications systems shall be classified as follows:

(1) One-way emergency communications systems
  (a) Distributed recipient mass notification systems
  (b) In-building fire emergency voice/alarm communications systems
  (c) In-building mass notification systems
  (d) Wide-area mass notification systems
(2) Two-way emergency communications systems
  (a) In-building emergency communications systems

1.3.3 Any reference or implied reference to a particular type of hardware shall be for the purpose of clarity and shall not be interpreted as an endorsement.

1.3.4 The intent and meaning of the terms used in this Code shall be, unless otherwise defined herein, the same as those of *NFPA 70*.

1.3.5 The requirements of Chapters 7, 10, 12, 14, 17, 18, 21, 23, 24, 26, and 27 shall apply unless otherwise noted in the specific chapter. Chapter 29 is designed to stand alone unless it specifically references an earlier chapter.

1.4 Retroactivity.

1.4.1 Unless otherwise required elsewhere in this Code, the provisions of this document shall not apply to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of the document.

1.4.2 In those cases where it is determined by the authority having jurisdiction that the existing situation involves a distinct hazard to life or property, retroactive application of the provisions of this document shall be permitted.

1.5 Equivalency.

1.5.1 Nothing in this Code shall prevent the use of systems, methods, devices, or appliances of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this Code.

1.5.2 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.3 The systems, methods, devices, or appliances that are found equivalent shall be approved.

1.6 Units and Formulas.

1.6.1 The units of measure in this Code shall be presented in US Customary Units (inch-pound units).

1.6.2 Where presented, the International System of Units (SI) shall follow the inch-pound units in parentheses.

1.6.3 Where both systems of units are presented, either system shall be acceptable for satisfying the requirements in this Code.

1.6.4 Where both systems of units are presented, users of this Code shall comply with both of the following:

(1) Shall utilize only one set of units consistently
(2) Shall not alternate between units

Δ **1.6.5*** The values presented for measurements in this Code shall be expressed with a degree of precision appropriate for practical application and enforcement.

1.6.6 Where extracted text contains values expressed in only one system of units, the values in the extracted text shall be retained without conversion to preserve the values established by the responsible technical committee in the source document.

1.7 Code Adoption Requirements. This Code shall be administered and enforced by the authority having jurisdiction designated by the governing authority. *(See Annex E for sample wording for enabling legislation.)*

Chapter 2 Referenced Publications

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

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

NFPA 10, *Standard for Portable Fire Extinguishers,* 2022 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2025 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,* 2023 edition.

NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines,* 2024 edition.

NFPA 70®, National Electrical Code®, 2023 edition.

NFPA 75, *Standard for the Fire Protection of Information Technology Equipment,* 2024 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2024 edition.

NFPA *101®, Life Safety Code®,* 2024 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems,* 2025 edition.

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems,* 2025 edition.

NFPA 170, *Standard for Fire Safety and Emergency Symbols,* 2024 edition.

NFPA 601, *Standard for Security Services in Fire Loss Prevention,* 2020 edition.

NFPA 715, *Standard for the Installation of Fuel Gases Detection and Warning Equipment,* 2023 edition.

NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems,* 2023 edition.

NFPA 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiner,* 2014 edition.

NFPA 1225, *Standard for Emergency Services Communications,* 2022 edition.

NFPA 1660, *Standard for Emergency, Continuity, and Crisis Management: Preparedness, Response, and Recovery,* 2024 edition.

2.3 Other Publications.

Δ **2.3.1 ASA Publications.** Acoustical Society of America, 1305 Walt Whitman Road, Suite 110, Melville, NY 11747-4300.

ANSI/ASA S1.4, *Electroacoustics — Sound Level Meters — Part 1: Specifications,* 2014.

ANSI/ASA S3.41, *Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI),* 2015.

2.3.2 ASCE Publications. American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191.

ASCE/SEI 7, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures,* 2022.

2.3.3 ASME Publications. American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990.

ASME A17.1/CSA B44, *Safety Code for Elevators and Escalators,* 2019.

2.3.4 ICC Publications. International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001.

ICC/ANSI A117.1, *Accessible and Usable Buildings and Facilities,* 2017.

2.3.5 IEEE Publications. IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ 08854-4141.

IEEE 450, *Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications,* 2020.

IEEE 1106, *Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications,* 2015.

ANSI/IEEE C2, *National Electrical Safety Code,* 2023.

N **2.3.6 ISA Publications.** International Society of Automation, 3252 S. Miami Boulevard, #102, Durham, NC 27703.

ANSI/ISA/IEC 62443-3-3, *Security for Industrial Automation and Control Systems, Part 3-3: System Security Requirements and Security Levels,* 2013.

ANSI/ISA/IEC 62443-4-2, *Security for Industrial Automation and Control Systems, Part 4-2: Technical Security Requirements for IACS Components*, 2018.

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

ISO 7731, *Ergonomics — Danger signals for public and work areas — Auditory danger signals*, 2003 (reconfirmed 2015).

ISO/IEC 27001, *Information security management systems*, 2022.

N **2.3.8 NIST Publications.** National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899-1070.

"Framework for Improving Critical Infrastructure Cybersecurity," Version 1.1, 2018.

Δ **2.3.9 Ericsson Group Publications.** Ericsson Group, 6300 Legacy Drive, Plano, TX 75024.

GR-506-CORE, *Signaling for Analog Interface,* 2011.

GR-909-CORE, *Generic Criteria for Fiber in the Loop Systems,* 2004.

2.3.10 TIA Publications. Telecommunications Industry Association, 1310 North Courthouse Road, Suite 890, Arlington, VA 22201.

ANSI/TIA 568.3, *Optical Fiber Cabling and Components Standard*, 2022.

Δ **2.3.11 UL Publications.** Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 217, *Smoke Alarms*, 2020, revised 2022.

UL 268, *Smoke Detectors for Fire Alarm Systems*, 2023.

UL 827, *Central-Station Alarm Services*, 2014, revised 2021.

UL 864, *Control Units and Accessories for Fire Alarm Systems*, 2022, revised 2023.

UL 985, *Household Fire Warning System Units*, 2015, revised 2022.

UL 1638, *Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories*, 2023.

UL 1730, *Smoke Detector Monitors and Accessories for Individual Living Units of Multifamily Residences and Hotel/Motel Rooms*, 2006, revised 2022.

UL 1971, *Signaling Devices for the Hearing Impaired*, 2002, revised 2018.

UL 1981, *Central-Station Automation Systems*, 2014, revised 2023.

UL 2017, *General-Purpose Signaling Devices and Systems*, 2008, revised 2018.

UL 2034, *Single and Multiple Station Carbon Monoxide Alarms,* 2017, revised 2022.

UL 2075, *Gas and Vapor Detectors and Sensors,* 2013, revised 2023.

UL 2525, *Two-Way Emergency Communications Systems for Rescue Assistance*, 2020.

UL 2572, *Mass Notification Systems*, 2016, revised 2018.

CAN/UL 2900-2-3, *Software Cybersecurity for Network-Connectable Products, Part 2-3: Particular Requirements for Security and Life Safety Signaling Systems*, 2020.

UL 60950-1, *Information Technology Equipment — Safety — Part 1: General Requirements*, 2007, revised 2019.

UL 62368-1, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements,* 2019, revised 2021.

2.3.12 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2020.

2.4 References for Extracts in Mandatory Sections.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2025 edition.

NFPA 70®, National Electrical Code®, 2023 edition.

NFPA *101®, Life Safety Code®,* 2024 edition.

NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids,* 2020 edition.

NFPA 715, *Standard for the Installation of Fuel Gases Detection and Warning Equipment,* 2023 edition.

NFPA 1225, *Standard for Emergency Services Communications,* 2022 edition.

NFPA 5000®, Building Construction and Safety Code®, 2024 edition.

Chapter 3 Definitions

Δ **3.1 General.**

N **3.1.1** The definitions contained in this chapter shall apply to the terms used in this Code.

N **3.1.2** 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.

N **3.1.3** *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* Code. A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

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

3.2.5* 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.

3.2.6 Shall. Indicates a mandatory requirement.

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

3.3 General Definitions.

3.3.1 Accessible (as applied to equipment). Capable of being reached for operation, renewal, and inspection. [**70,** 2023] (SIG-FUN)

3.3.2 Accessible (as applied to wiring methods). Capable of being removed or exposed without damaging the building structure or finish or not permanently closed in or blocked by the structure, other electrical equipment, other building systems, or finish of the building. [**70,** 2023] (SIG-FUN)

3.3.3 Accessible, Readily (Readily Accessible). Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders, and so forth. [**70,** 2023] (SIG-FUN)

3.3.4 Accessible Spaces (as applied to detection coverage in Chapter 17). Spaces or concealed areas of construction that can be entered via openable panels, doors, hatches, or other readily movable construction elements. (SIG-IDS)

3.3.5 Acknowledge. An action performed by a person to confirm that a message or signal has been received. (SIG-SSS)

3.3.6* Acoustically Distinguishable Space (ADS). An emergency communications system notification zone, or subdivision thereof, that might be an enclosed or otherwise physically defined space, or that might be distinguished from other spaces because of different acoustical, environmental, or use characteristics, such as reverberation time and ambient sound pressure level. (SIG-NAS)

3.3.7 Active Multiplex System. A multiplexing system in which signaling devices such as transponders are employed to transmit status signals of each initiating device or initiating device circuit within a prescribed time interval so that the lack of receipt of such a signal can be interpreted as a trouble signal. (SIG-SSS)

3.3.8 Addressable Device. A fire alarm system component, with an input, output, or combination function, that is discretely identified by a unique address. (SIG-FUN)

3.3.9 Adverse Condition. Any condition occurring in a communications or transmission channel that interferes with the proper transmission or interpretation, or both, of status change signals at the supervising station. *(See also 3.3.277.10, Trouble Signal.)* (SIG-SSS)

3.3.10 Air Sampling–Type Detector. See 3.3.79, Detector.

3.3.11 Alarm. An indication of the existence of a condition that requires immediate response. (SIG-FUN)

3.3.11.1 *Carbon Monoxide Alarm.* A single-or multiple-station alarm responsive to carbon monoxide (CO). (SIG-HOU)

3.3.12 Alarm Box.

3.3.12.1 *Auxiliary Alarm Box.* An alarm box that can only be operated from one or more remote initiating devices or an auxiliary alarm system used to send an alarm to the communications center. (SIG-PRS)

3.3.12.2 *Combination Fire Alarm and Guard's Tour Box.* A manually operated box capable of transmitting a fire alarm signal and a separate guard patrol tour supervisory signal. (SIG-IDS)

3.3.12.3* *Manual Fire Alarm Box.* A manually operated device used to initiate a fire alarm signal. (SIG-IDS)

3.3.12.4 *Master Alarm Box.* A publicly accessible alarm box that can also be operated by one or more remote initiating devices or an auxiliary alarm system used to send an alarm to the communications center. (SIG-PRS)

3.3.12.5 *Publicly Accessible Alarm Box.* An enclosure, accessible to the public, housing a manually operated transmitter used to send an alarm to the communications center. (SIG-PRS)

3.3.13 Alarm Repeater System. A device or system for the purpose of automatically retransmitting alarm information received by the alarm processing equipment. (SIG-PRS)

3.3.14 Alarm Service. The service required following the receipt of an alarm signal. (SIG-SSS)

3.3.15 Alarm Signal. See 3.3.277, Signal.

3.3.16 Alarm System. See 3.3.120, Fire Alarm System; 3.3.307, Supervising Station Alarm Systems; 3.3.234, Public Emergency Alarm Reporting System; 3.3.99.1.2, In-Building Fire Emergency Voice/Alarm Communications System; and 3.3.99.1.3, In-Building Mass Notification System.

3.3.17 Alarm Verification Feature. A feature of automatic fire detection and alarm systems to reduce unwanted alarms wherein smoke detectors report alarm conditions for a minimum period of time, or confirm alarm conditions within a given time period after being reset, in order to be accepted as a valid alarm initiation signal. (SIG-PRO)

3.3.18 Alert Tone. An attention-getting signal to alert occupants of the pending transmission of a voice message. (SIG-PRO)

3.3.19 Analog Initiating Device (Sensor). See 3.3.152, Initiating Device.

3.3.20* Ancillary Functions. Nonemergency activations of the fire alarm or mass notification audible, visual, and textual output circuits. (SIG-ECS)

3.3.21 Annunciator. A unit containing one or more indicator lamps, alphanumeric displays, or other equivalent means in which each indication provides status information about a circuit, condition, or location. (SIG-FUN)

3.3.22 Apartment Building. A building or portion thereof containing three or more dwelling units with independent cooking and bathroom facilities. (SIG-HOU) [**5000**, 2024]

3.3.23 Audible Notification Appliance. See 3.3.194, Notification Appliance.

3.3.24 Authorized Personnel. See 3.3.213, Personnel.

3.3.25 Automatic Extinguishing System Supervisory Device. See 3.3.152, Initiating Device.

3.3.26 Automatic Fire Detector. See 3.3.79, Detector.

3.3.27 Automatic Fire Extinguishing or Suppression System Operation Detector. See 3.3.79, Detector.

3.3.28 Autonomous Control Unit (ACU). See 3.3.71, Control Unit.

3.3.29 Auxiliary Alarm System. See 3.3.234, Public Emergency Alarm Reporting System.

3.3.30 Auxiliary Box. See 3.3.12, Alarm Box.

N **3.3.31* Auxiliary Service Provider (ASP).** An entity or service that receives signals from a protected premises fire alarm system, modifies or manipulates the signals, and directs the signals to the supervising station and is positioned in the network topology such that signals cannot reach the supervising station without the entity or service. (SIG-SSS)

3.3.32* Average Ambient Sound Level. The root mean square, A-weighted, sound pressure level measured over the period of time that any person is present, or a 24-hour period, whichever time period is the lesser. (SIG-NAS)

3.3.33* Backbone. A part of a network that acts as a common infrastructure to which the branch parts are connected. (SIG-PRO)

3.3.34* Battery. Two or more cells connected together electrically. (SIG-TMS)

3.3.34.1 ***Battery Capacity.*** The electrical energy available from a fully charged battery expressed in ampere-hours. (SIG-TMS)

3.3.34.2 ***Battery Charger.*** A device used to restore and maintain the charge of a secondary battery in which electrical energy is converted to chemical energy. (SIG-TMS)

3.3.34.2.1 ***Float Charge.*** A constant-voltage charge applied to a battery to maintain it in a fully charged condition. (SIG-TMS)

3.3.34.2.2 ***Fully Charged.*** A condition synonymous with 100 percent state of charge. *[See also 3.3.34.2.3, State of Charge (SOC).]* (SIG-TMS)

3.3.34.2.3 ***State of Charge (SOC).*** The stored or remaining capacity of a battery at a given time expressed as a percentage of its rated capacity. (SIG-TMS)

3.3.34.2.4 ***Trickle Charge.*** A continuous, low-rate, constant-current charge given to a cell or battery to keep the unit fully charged. *(See also 3.3.34.2.1, Float Charge.)* (SIG-TMS)

3.3.34.3 ***Battery Load Test.*** A controlled discharge of a battery at a specified rate for a given period of time until a final voltage is achieved to determine battery capacity. (SIG-TMS)

3.3.34.4 ***Battery Unit.*** See 3.3.45.3, Unit (Multi-Cell). (SIG-TMS)

3.3.34.5 ***Rechargeable Battery.*** An electrochemical cell capable of being discharged and then recharged. (SIG-TMS)

3.3.35 Beam Construction. See 3.3.44, Ceiling Surfaces.

3.3.36 Building Fire Alarm System. See 3.3.120, Fire Alarm System.

3.3.37 Building System Information Unit (BSIU). A computer-based electronic device that is intended to display building information and execute system control functions, including fire system information display and control. (SIG-PRO)

3.3.38 Carbon Monoxide Detection System. A system or portion of a combination system that consists of a control unit, components, and circuits arranged to monitor and annunciate the status of carbon monoxide alarm initiating devices and to initiate the appropriate response to those signals. (SIG-PRO)

3.3.38.1 ***Combination Carbon Monoxide Detection System.*** A carbon monoxide detection system in which components are used, in whole or in part, in common with a non–carbon monoxide signaling system, and in which components are not used as part of a fire alarm system. (SIG-PRO)

3.3.38.2 ***Household Carbon Monoxide Detection System.*** A system of devices that uses a control unit to produce an alarm signal in the household for the purpose of notifying the occupants of the presence of concentrations of carbon monoxide that could pose a life safety risk. (SIG-HOU)

N **3.3.39 Carbon Monoxide Source.** Equipment or a permanently installed appliance, fireplace, or process used inside a building that produces or emits carbon monoxide gas. (SIG-IDS)

3.3.40 Carrier. High-frequency energy that can be modulated by voice or signaling impulses. (SIG-SSS)

3.3.41 Carrier System. A means of conveying a number of channels over a single path by modulating each channel on a different carrier frequency and demodulating at the receiving point to restore the signals to their original form. (SIG-SSS)

3.3.42* Ceiling. The upper surface of a space, regardless of height. (SIG-IDS)

3.3.42.1 ***Level Ceilings.*** Ceilings that have a slope of less than or equal to 1 in 8. (SIG-IDS)

3.3.42.2 ***Sloping Ceiling.*** A ceiling that has a slope of more than 1 in 8. (SIG-IDS)

3.3.42.3* ***Sloping Peaked-Type Ceiling.*** A ceiling in which the ceiling slopes in two directions from the highest point. (SIG-IDS)

3.3.42.4* ***Sloping Shed-Type Ceiling.*** A ceiling in which the high point is at one side with the slope extending toward the opposite side. (SIG-IDS)

3.3.43 Ceiling Height. The height from the continuous floor of a room to the continuous ceiling of a room or space. (SIG-IDS)

3.3.44 Ceiling Surfaces.

3.3.44.1 ***Beam Construction.*** Ceilings that have solid structural or solid nonstructural members projecting down from the ceiling surface more than 4 in. (100 mm) and spaced more than 36 in. (910 mm), center to center. (SIG-IDS)

3.3.44.2 ***Girder.*** A support for beams or joists that runs at right angles to the beams or joists. (SIG-IDS)

3.3.44.3* ***Smooth Ceiling.*** A ceiling surface uninterrupted by continuous projections, such as solid joists, beams, or ducts, extending more than 4 in. (100 mm) below the ceiling surface. (SIG-IDS)

3.3.44.4 ***Solid Joist Construction.*** Ceilings that have solid structural or solid nonstructural members projecting down from the ceiling surface for a distance of more than 4 in. (100 mm) and spaced at intervals of 36 in. (910 mm) or less, center to center. (SIG-IDS)

3.3.45 Cell (as applied to batteries). The basic electrochemical unit, characterized by an anode and a cathode, used to receive, store, and deliver electrical energy. [**70,** 2023] (SIG-TMS)

3.3.45.1 ***Primary (Dry) Cell.*** A nonrechargeable electrochemical cell requiring periodic replacement, such as a 9-volt alkaline cell. (SIG-FUN)

3.3.45.2 ***Starved Electrolyte Cell.*** A cell in which liquid electrolyte is immobilized, also known as an absorbed glass mat (AGM) cell or a gelled electrolyte cell (gel cell). (SIG-TMS)

3.3.45.2.1 ***Absorbed Glass Mat (AGM) Cell.*** A cell in which the liquid electrolyte is immobilized in fiberglass or polymeric fiber separators. (SIG-TMS)

3.3.45.2.2 ***Gelled Electrolyte Cell (Gel Cell).*** A cell in which the electrolyte is immobilized by addition of a gelling agent. (SIG-TMS)

3.3.45.3 ***Unit (Multi-Cell).*** Multiple cells in a single container, such as a 12-volt unit composed of six 2-volt cells. (SIG-TMS)

3.3.45.4* ***Valve-Regulated Lead-Acid (VRLA) Cell.*** A sealed lead-acid cell with a valve that opens to the atmosphere when the internal pressure in the cell exceeds atmospheric pressure by a preselected amount. (SIG-TMS)

3.3.46 Central Station. See 3.3.306.1, Central Supervising Station.

3.3.47 Central Station Alarm System. See 3.3.307.1, Central Station Service Alarm System.

3.3.48 Central Station Service. See 3.3.308, Supervising Station Service.

3.3.49 Central Station Service Alarm System. See 3.3.307, Supervising Station Alarm Systems.

3.3.50 Central Supervising Station. See 3.3.306, Supervising Station.

3.3.51 Certified. See 3.2.5, Listed, for certified equipment.

3.3.52 Channel. A path for voice or signal transmission that uses modulation of light or alternating current within a frequency band. (SIG-SSS)

3.3.52.1 ***Communications Channel.*** A circuit or path connecting a subsidiary station(s) to a supervising station(s) over which signals are carried. (SIG-SSS)

3.3.52.2* ***Radio Channel.*** A band of frequencies of a width sufficient to allow its use for radio communications. (SIG-SSS)

3.3.52.3 ***Transmission Channel.*** A circuit or path connecting transmitters to supervising stations or subsidiary stations on which signals are carried. (SIG-SSS)

3.3.53 Circuit. Either a means of providing power or a connection path between locations *[see 3.3.210, Path (Pathways)]*. (SIG-PRO)

3.3.54 Circuit Interface. See 3.3.157, Interface.

3.3.55 Cloud Chamber Smoke Detection. See 3.3.290, Smoke Detection.

3.3.56* Coded. An audible or visual signal that conveys several discrete bits or units of information. (SIG-NAS)

3.3.57 Combination Detector. See 3.3.79, Detector.

3.3.58 Combination Emergency Communications Systems. See 3.3.100, Emergency Communications Systems — Combination.

3.3.59 Combination Fire Alarm and Guard's Tour Box. See 3.3.12, Alarm Box.

3.3.60 Combination System. See 3.3.120, Fire Alarm System.

3.3.61 Common Talk Mode. See 3.3.318, Talk Mode.

Δ **3.3.62* Communications Center.** A building or portion of a building that is specifically configured for the primary purpose of providing emergency communications services or public safety answering point (PSAP) services to one or more public safety agencies under the authority or authorities having jurisdiction. [**1225,** 2022] (SIG-PRS)

3.3.63 Communications Channel. See 3.3.52, Channel.

3.3.64 Communications Circuit. Any signaling path of an emergency communications system that carries voice, audio, data, or other signals. (SIG-ECS)

3.3.65 Communications Cloud. The area in the communications path that is supported by providers of communications services not governed under the scope of *NFPA 72* in which signals travel between a protected property and a monitoring station. Depending on the type of transmission that is used, signals can travel on a single defined route or through various routes depending on what is available when the signal is initiated. (SIG-SSS)

3.3.66 Communications, Radio (as applied to Chapter 27).

3.3.66.1 ***One-Way Radio Communications.*** A communications channel on which alarm boxes only transmit signals and are incapable of receiving responses. (SIG-PRS)

3.3.66.2 ***Two-Way Radio Communications.*** A communications channel on which alarm boxes and the communications center both transmit and receive signals. (SIG-PRS)

3.3.67* Condition. A situation, environmental state, or equipment state of a fire alarm or signaling system. (SIG-FUN)

3.3.67.1 ***Abnormal (Off-Normal) Condition.*** A situation, environmental state, or equipment state that warrants some type of signal, notification, communication, response, action, or service. (SIG-FUN)

3.3.67.1.1* ***Alarm Condition.*** An abnormal condition that poses an immediate threat to life, property, or mission. (SIG-FUN)

3.3.67.1.2* ***Pre-Alarm Condition.*** An abnormal condition that poses a potential threat to life, property, or mission, and time is available for investigation. (SIG-FUN)

3.3.67.1.3* ***Supervisory Condition.*** An abnormal condition in connection with the supervision of other systems, processes, or equipment. (SIG-FUN)

3.3.67.1.4* ***Trouble Condition.*** An abnormal condition in a system due to a fault. (SIG-FUN)

3.3.67.2 ***Normal Condition.*** Circuits, systems, and components are functioning as designed and no abnormal condition exists. (SIG-FUN)

3.3.68 Constantly Attended. Attended 24 hours a day and 365 days a year. (SIG-PRO)

3.3.69 Contiguous Property. See 3.3.226, Property.

3.3.70 Control Equipment. Equipment listed as either a control unit or control unit accessory. (SIG-FUN)

3.3.71 Control Unit. A system component that monitors inputs and controls outputs through various types of circuits. (SIG-PRO)

3.3.71.1* ***Autonomous Control Unit (ACU).*** The primary control unit for an in-building mass notification system. (SIG-ECS)

3.3.71.2 ***Emergency Communications Control Unit (ECCU).*** A system capable of sending mass notification messages to individual buildings, zones of buildings, individual outdoor loudspeaker arrays, or zones of outdoor loudspeaker arrays; or a building, multiple buildings, outside areas, or a combination of these. (SIG-ECS)

3.3.71.3 ***Fire Alarm Control Unit (FACU).*** See 3.3.117, Fire Alarm Control Unit (FACU).

3.3.71.4 ***Wireless Control Unit.*** A component that transmits/receives and processes wireless signals. (SIG-PRO)

3.3.72 Cybersecurity. The protection of systems from theft or damage of data, or damage to hardware or software, as well as from unauthorized command or control or access to any information of any services the systems provide. (SIG-FUN)

3.3.73 Day-Care Home. A building or portion of a building in which more than 3 but not more than 12 clients receive care, maintenance, and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hours per day. [***101,*** 2024] (SIG-HOU)

3.3.74 Dedicated Function Fire Alarm Control Unit. See 3.3.117, Fire Alarm Control Unit (FACU).

3.3.75 Dedicated Function Fire Alarm System. See 3.3.120, Fire Alarm System.

3.3.76 Deficiency. A condition that interferes with the service or reliability for which the part, system, or equipment was intended. (SIG-TMS)

3.3.77 Delinquency Signal. See 3.3.277, Signal.

3.3.78* Design Professional. An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the jurisdiction in which the project is to be constructed, or other professional with qualifications or credentials acceptable to the jurisdiction in which the project is to be constructed. (SIG-ECS)

3.3.79 Detector. A device suitable for connection to a circuit that has a sensor that responds to a physical stimulus such as gas, heat, light, sound, or smoke. (SIG-IDS)

N **3.3.79.1*** ***Acoustic Leak Detector.*** A device that detects the presence of a gas leak through detection of the sound produced by a pressurized gas release. (SIG-IDS)

3.3.79.2 ***Air-Sampling-Type Detector.*** A detector that draws air and particulate from the protected area into a sampling network that runs to the detector. An aspiration fan in the detector housing draws air from the protected area back to the detector through air sampling ports, piping, or tubing. At the detector, the air is analyzed for fire products. (SIG-IDS)

3.3.79.3* ***Automatic Fire Detector.*** A device designed to detect the presence of a fire signature and to initiate action. (SIG-IDS)

3.3.79.4 ***Automatic Fire Extinguishing or Suppression System Operation Detector.*** A device that automatically detects the operation of a fire extinguishing or suppression system by means appropriate to the system employed. (SIG-IDS)

3.3.79.5 ***Carbon Monoxide Detector.*** A device that contains electrical components, a carbon monoxide sensing means, and connections for electrical power and signaling circuits. (SIG-IDS)

3.3.79.6* ***Combination Detector.*** A device that either responds to more than one of the fire phenomena or employs more than one operating principle to sense one of these phenomena. This device has listings for each sensing method employed. (SIG-IDS)

3.3.79.7 ***Electrical Conductivity Heat Detector.*** A line-type or spot-type sensing element in which resistance varies as a function of temperature. (SIG-IDS)

3.3.79.8 ***Fire–Gas Detector.*** A device that detects gases produced by a fire. (SIG-IDS)

3.3.79.9* ***Fixed-Temperature Detector.*** A device that responds when its operating element becomes heated to a predetermined level. (SIG-IDS)

3.3.79.10* ***Flame Detector.*** A radiant-energy-sensing fire detector that detects the radiant energy emitted by a flame. *(Refer to A.17.8.2.)* (SIG-IDS)

N **3.3.79.11** ***Fuel Gas Detector.*** A device having a sensor that responds to fuel gas that is connected to an alarm control unit. [**715,** 2023] (SIG-IDS)

3.3.79.12 ***Gas Detector.*** A device that detects the presence of a specified gas concentration. (SIG-IDS)

3.3.79.13 ***Heat Detector.*** A fire detector that detects either abnormally high temperature or rate-of-temperature rise, or both. (SIG-IDS)

3.3.79.14* ***Line-Type Detector.*** A device in which detection is continuous along a path. (SIG-IDS)

3.3.79.15* ***Multi-Criteria Detector.*** A device that contains multiple sensors that separately respond to physical stimulus such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. This sensor is capable of generating only one alarm signal from the sensors employed in the design either independently or in combination. The sensor output signal is mathematically evaluated to determine when an alarm signal is warranted. The evaluation can be performed either at the detector or at the control unit. This detector has a single listing that establishes the primary function of the detector. (SIG-IDS)

3.3.79.16* ***Multi-Sensor Detector.*** A device that contains multiple sensors that separately respond to physical stimulus such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. A device capable of generating multiple alarm signals from any one of the sensors employed in the design, independently or in combination. The sensor output signals are mathematically evaluated to determine when an alarm signal is warranted. The evaluation can be performed either at the detector or at the control unit. This device has listings for each sensing method employed. (SIG-IDS)

3.3.79.17 ***Other Fire Detectors.*** Devices that detect a phenomenon other than heat, smoke, flame, or gases produced by a fire. (SIG-IDS)

3.3.79.18 ***Pneumatic Rate-of-Rise Tubing Heat Detector.*** A line-type detector comprising small-diameter tubing, usually copper, that is installed on the ceiling or high on the walls throughout the protected area. The tubing is terminated in a detector unit containing diaphragms and associated contacts set to actuate at a predetermined pressure. The system is sealed except for calibrated vents that compensate for normal changes in temperature. (SIG-IDS)

3.3.79.19 ***Projected-Beam-Type Detector.*** A type of photoelectric light obscuration smoke detector wherein the beam spans the protected area. (SIG-IDS)

3.3.79.20 ***Radiant-Energy-Sensing Fire Detector.*** A device that detects radiant energy, such as ultraviolet, visible, or infrared, that is emitted as a product of combustion reaction and obeys the laws of optics. (SIG-IDS)

3.3.79.21* ***Rate Compensation Detector.*** A device that responds when the temperature of the air surrounding the device reaches a predetermined level, regardless of the rate-of-temperature rise. (SIG-IDS)

3.3.79.22* ***Rate-of-Rise Detector.*** A device that responds when the temperature rises at a rate exceeding a predetermined value. (SIG-IDS)

3.3.79.23 ***Smoke Detector.*** A device that detects visible or invisible particles of combustion. (SIG-IDS)

3.3.79.24* ***Spark/Ember Detector.*** A radiant-energy-sensing fire detector that is designed to detect sparks or embers. (SIG-IDS)

3.3.79.25* ***Spot-Type Detector.*** A device in which the detecting element is concentrated at a particular location. (SIG-IDS)

N **3.3.79.26** ***Thermal Image Fire Detector.*** An initiating device that senses overheated combustible material by imaging in the long-wave infrared wavelengths (i.e., far infrared) using a focal plane array. (SIG-IDS)

3.3.80* Device (Class N). A supervised component of a life safety system that communicates with other components of life safety systems and that collects environmental data or performs specific input or output functions necessary to the operation of the life safety system. (SIG-PRO)

3.3.81 Digital Alarm Communicator Receiver (DACR). A system component that accepts and displays signals from digital alarm communicator transmitters (DACTs) sent over a managed facilities-based voice network. (SIG-SSS)

3.3.82 Digital Alarm Communicator System (DACS). A system in which signals are transmitted from a digital alarm communicator transmitter (DACT) located at the protected premises through a managed facilities-based voice network to a digital alarm communicator receiver (DACR). (SIG-SSS)

3.3.83* Digital Alarm Communicator Transmitter (DACT). A fire alarm system component at the protected premises to which a fire alarm control unit or a group of control units are connected that transmits signals via loop start technology. (SIG-SSS)

3.3.84 Digital Alarm Radio Receiver (DARR). A system component composed of two subcomponents: one that receives and decodes radio signals, the other that annunciates the decoded data. These two subcomponents can be coresident at the central station or separated by means of a data transmission channel. (SIG-SSS)

3.3.85 Digital Alarm Radio System (DARS). A system in which signals are transmitted from a digital alarm radio transmitter (DART) located at a protected premises through a radio channel to a digital alarm radio receiver (DARR). (SIG-SSS)

3.3.86 Digital Alarm Radio Transmitter (DART). A system component that is connected to or an integral part of a digital alarm communicator transmitter (DACT) that is used to provide an alternate radio transmission channel. (SIG-SSS)

3.3.87 Display. The visible representation of output data, other than printed copy. (SIG-NAS)

3.3.88 Distributed Recipient Mass Notification System (DRMNS). See 3.3.99, Emergency Communications System (ECS).

3.3.89 Dormitory. A building or a space in a building in which group sleeping accommodations are provided for more than 16 persons who are not members of the same family in one room, or a series of closely associated rooms, under joint occupancy and single management, with or without meals, but without individual cooking facilities. [***101,*** 2024] (SIG-HOU)

3.3.90* Double Doorway. A single opening that has no intervening wall space or door trim separating the two doors. (SIG-IDS)

3.3.91 Downlink. The radio signal from the base station transmitter to the portable public safety subscriber receiver. (SIG-ECS)

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

3.3.92 Dwelling Unit. One or more rooms arranged for complete, independent housekeeping purposes, with space for eating, living, and sleeping; facilities for cooking; and provisions for sanitation. [**5000,** 2024] (SIG-HOU)

3.3.93 Effective Masked Threshold. The minimum sound level at which the tone signal is audible in ambient noise. (SIG-NAS)

3.3.94 Electrical Conductivity Heat Detector. See 3.3.79, Detector.

3.3.95 Electromechanical Releasing Device. Mechanical devices, including fusible links, electrically monitored for contact closure to initiate a signal to the FACU. (SIG-TMS)

3.3.96* Ember. A particle of solid material that emits radiant energy due either to its temperature or the process of combustion on its surface. *(See also 3.3.296, Spark.)* (SIG-IDS)

3.3.97 Emergency Command Center. See 3.3.101, Emergency Communications System — Emergency Command Center.

3.3.98 Emergency Communications Control Unit (ECCU). See 3.3.71, Control Unit.

3.3.99* Emergency Communications System (ECS). A system for the protection of life by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action. (SIG-ECS)

3.3.99.1 ***One-Way Emergency Communications System.*** Systems intended to broadcast information, in an emergency, to people in one or more specified indoor or outdoor areas. It is intended that emergency messages be conveyed either by audible, visual, or textual means, or any combination thereof. (SIG-ECS)

3.3.99.1.1 ***Distributed Recipient Mass Notification System (DRMNS).*** A system meant to communicate directly to targeted individuals and groups that might not be in a contiguous area. (SIG-ECS)

3.3.99.1.2 ***In-Building Fire Emergency Voice/Alarm Communications System.*** Dedicated manual or automatic equipment for originating and distributing voice instructions, as well as alert and evacuation signals pertaining to a fire emergency, to the occupants of a building. (SIG-ECS)

3.3.99.1.3 ***In-Building Mass Notification System.*** A system used to provide information and instructions to people in a building(s) or other space using intelligible voice communications and including visual signals, text, graphics, tactile, or other communication methods. (SIG-ECS)

3.3.99.1.4 ***Wide-Area Mass Notification System.*** A system installed to provide real-time information to outdoor areas that could have the capability to communicate with other notification systems provided for a campus, military base, municipality, or similar single or multiple contiguous areas. (SIG-ECS)

3.3.99.2 ***Two-Way Emergency Communications System.*** A system in one of two categories: those systems that are anticipated to be used by building occupants [area of refuge two-way emergency communications systems (ECSs), elevator landing two-way ECSs, occupant evacuation elevator lobby two-way ECSs, and stairway communications systems], and those systems that are to be used by firefighters, police, and other emergency services personnel. Two-way ECSs are used to both exchange information and to communicate information such as, but not limited to, instructions, acknowledgement of receipt of messages, condition of local environment, and condition of persons, and to give assurance that help is on the way. (SIG-ECS)

3.3.100 Emergency Communications Systems — Combination. Various emergency communications systems such as fire alarm, mass notification, firefighter communications, area of refuge communications, elevator communications, or others that can be served through a single control system or through an interconnection of several control systems. (SIG-ECS)

3.3.101* Emergency Communications System — Emergency Command Center. The room(s) or area(s) staffed during any emergency event by assigned emergency management staff. The room or area contains system communications and control equipment serving one or more buildings where responsible authorities receive information from premises sources or systems or from (higher level) regional or national sources or systems and then disseminate appropriate information to individuals, a building, multiple buildings, outside campus areas, or a combination of these in accordance with the emergency response plan established for the premises. The room or area contains the controls and indicators from which the emergency communications systems located in the room or area can be manually controlled as required by the emergency response plan and the emergency management coordinator. (SIG-ECS)

3.3.102* Emergency Control Function Interface Device. A listed fire alarm or signaling system component that directly interfaces with the system that operates the emergency control function. (SIG-PRO)

3.3.103* Emergency Control Functions. Building, fire, and emergency control elements or systems that are initiated by the fire alarm or signaling system and either increase the level of life safety for occupants or control the spread of the harmful effects of fire or other dangerous products. (SIG-PRO)

3.3.104 Emergency Personnel. See 3.3.213, Personnel.

Δ **3.3.105* Emergency Response Agency (ERA).** Organizations providing law enforcement, emergency medical, fire, rescue, communications, and related support services. [**1225,** 2022] (SIG-SSS)

Δ **3.3.106* Emergency Response Facility (ERF).** A structure or a portion of a structure that houses emergency response agency equipment or personnel for response to events. [**1225,** 2022] (SIG-PRS)

3.3.107 Emergency Response Plan. A documented set of actions to address the planning for, management of, and response to natural, technological, and man-made disasters and other emergencies. (SIG-ECS)

3.3.108* Endpoint (Class N). The end of a pathway where a single addressable device or a control unit is connected. (SIG-PRO)

3.3.109* Evacuation. The withdrawal of occupants from a building. (SIG-PRO)

3.3.110 Evacuation Signal. See 3.3.277, Signal.

3.3.111 Executive Software. See 3.3.293, Software.

3.3.112 Exit Marking Audible Notification Appliance. See 3.3.194, Notification Appliance.

3.3.113 FACP. Fire Alarm Control Panel. See 3.3.117, Fire Alarm Control Unit (FACU).

3.3.114 False Alarm. See 3.3.332, Unwanted Alarm.

3.3.115 Field of View. The virtual cone that extends out from the detector within which the effective sensitivity of the detector is at least 50 percent of its on-axis, listed, or approved sensitivity. (SIG-IDS)

3.3.116 Fire Alarm Control Interface (FACI). See 3.3.157, Interface.

3.3.117* Fire Alarm Control Unit (FACU). A component of the fire alarm system that receives signals from initiating devices or other fire alarm control units and processes these signals to determine part or all of the required fire alarm system output function(s). (SIG-PRO)

3.3.117.1 ***Master Fire Alarm Control Unit.*** A fire alarm control unit that serves the protected premises or portion of the protected premises as a local fire alarm control unit and accepts inputs from other fire alarm control units. (SIG-PRO)

3.3.117.2 ***Protected Premises (Local) Control Unit.*** A fire alarm control unit that serves the protected premises or a portion of the protected premises. (SIG-PRO)

3.3.117.2.1* ***Dedicated Function Fire Alarm Control Unit.*** A protected premises fire alarm control unit that is intended to operate specifically identified emergency control function(s). (SIG-PRO)

3.3.117.2.2 ***Releasing Service Fire Alarm Control Unit.*** A protected premises fire alarm control unit specifically listed for releasing service that is part of a fire suppression system and which provides control outputs to release a fire suppression agent based on either automatic or manual input. (SIG-PRO)

3.3.118 Fire Alarm/Evacuation Signal Tone Generator. A device that produces a fire alarm/evacuation tone upon command. (SIG-PRO)

3.3.119 Fire Alarm Signal. See 3.3.277, Signal.

3.3.120 Fire Alarm System. A system or portion of a combination system that consists of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals. (SIG-FUN)

3.3.120.1* ***Combination System.*** A fire alarm system in which components are used, in whole or in part, in common with a non-fire signaling system. (SIG-PRO)

3.3.120.2 ***Household Fire Alarm System.*** A system of devices that uses a fire alarm control unit to produce an alarm signal in the household for the purpose of notifying the occupants of the presence of a fire so that they will evacuate the premises. (SIG-HOU)

3.3.120.3 ***Municipal Fire Alarm System.*** A public emergency alarm reporting system. (SIG-PRS)

3.3.120.4* ***Protected Premises (Local) Fire Alarm System.*** A fire alarm system located at the protected premises. (SIG-PRO)

3.3.120.4.1 ***Building Fire Alarm System.*** A protected premises fire alarm system that includes any of the features identified in 23.3.5.1 and that serves the general fire alarm needs of a building or buildings and provides notification. (SIG-PRO)

3.3.120.4.2 ***Dedicated Function Fire Alarm System.*** A protected premises fire alarm system installed specifically to perform emergency control function(s) where a building fire alarm system is not required. (SIG-PRO)

3.3.120.4.3 ***Releasing Fire Alarm System.*** A protected premises fire alarm system that is part of a fire suppression system and/or that provides control inputs to a fire suppression system related to the fire suppression system's sequence of operations and outputs for other signaling and notification. (SIG-PRO)

3.3.121* Fire Command Center. The principal attended or unattended room or area where the status of the detection, alarm communications, control systems, and other emergency systems is displayed and from which the system(s) can be manually controlled. (SIG-ECS)

3.3.122 Fire Extinguisher Electronic Monitoring Device. A device connected to a control unit that monitors the fire extinguisher in accordance with the requirements of NFPA 10. (SIG-IDS)

3.3.123 Fire Warden. A building staff member or a tenant trained to perform assigned duties in the event of a fire emergency. (SIG-PRO)

3.3.124 Fire Warning Equipment. Any detector, alarm, device, or material related to single- and multiple-station alarms or household fire alarm systems. (SIG-HOU)

3.3.125 Fire–Gas Detector. See 3.3.79, Detector.

3.3.126 Fixed-Temperature Detector. See 3.3.79, Detector.

3.3.127 Flame. A body or stream of gaseous material involved in the combustion process and emitting radiant energy at specific wavelength bands determined by the combustion chemistry of the fuel. (SIG-IDS)

3.3.128 Flame Detector. See 3.3.79, Detector.

3.3.129 Flame Detector Sensitivity. The distance along the optical axis of the detector at which the detector can detect a fire of specified size and fuel within a given time frame. (SIG-IDS)

3.3.130 Frequency. Minimum and maximum time between events. (SIG-TMS)

3.3.130.1 ***Weekly Frequency.*** Fifty-two times per year, once per calendar week. (SIG-TMS)

3.3.130.2 ***Monthly Frequency.*** Twelve times per year, once per calendar month. (SIG-TMS)

3.3.130.3 ***Quarterly Frequency.*** Four times per year with a minimum of 2 months, maximum of 4 months. (SIG-TMS)

3.3.130.4 ***Semiannual Frequency.*** Twice per year with a minimum of 4 months, maximum of 8 months. (SIG-TMS)

3.3.130.5 ***Annual Frequency.*** Once per year with a minimum of 9 months, maximum 15 months. (SIG-TMS)

N **3.3.131 Fuel-Burning Equipment.** Any device that burns solid, liquid, or gaseous fuel or a combination thereof. (SIG-HOU)

N **3.3.132 Fuel Gas Warning Equipment.** Any detector, alarm, device, or material related to single- and multiple-station alarms or household fuel gas detection systems. [**715,** 2023] (SIG-IDS)

3.3.133 Gateway. A device that is used in the transmission of serial data (digital or analog) from the fire alarm control unit to other building system control units, equipment, or networks and/or from other building system control units to the fire alarm control unit. (SIG-PRO)

3.3.134 Girder. See 3.3.44, Ceiling Surfaces.

3.3.135 Guard's Tour Reporting Station. A device that is manually or automatically initiated to indicate the route being followed and the timing of a guard's tour. (SIG-IDS)

3.3.136 Guard's Tour Supervisory Signal. See 3.3.277, Signal.

3.3.137 Guest Room. An accommodation combining living, sleeping, sanitary, and storage facilities within a compartment. [***101*,** 2024] (SIG-HOU)

3.3.138 Guest Suite. An accommodation with two or more contiguous rooms comprising a compartment, with or without doors between such rooms, that provides living, sleeping, sanitary, and storage facilities. [***101*,** 2024] (SIG-HOU)

3.3.139* Hearing Loss. A full or partial decrease in the ability to detect or comprehend sounds. (SIG-HOU)

3.3.139.1 ***Profound Hearing Loss.*** A hearing threshold of greater than 90 dB. (SIG-HOU)

3.3.140 Heat Alarm. A single- or multiple-station alarm responsive to heat. (SIG-HOU)

3.3.140.1 ***Mechanically Powered, Single-Station Heat Alarm.*** A single-station heat alarm employing a mechanical power source. (SIG-HOU)

3.3.141 Heat Detector. See 3.3.79, Detector.

3.3.142 High Power Loudspeaker Array (HPLA). An array that provides capability for voice and tone communications to large outdoor areas. (SIG-ECS)

3.3.143 High Volume Low Speed (HVLS) Fan. A ceiling fan that is approximately 6 ft (1.8 m) to 24 ft (7.3 m) in diameter with a rotational speed of approximately 30 to 70 revolutions per minute. [**13,** 2025] (SIG-PRO)

3.3.144 Hotel. A building or groups of buildings under the same management in which there are sleeping accommodations for more than 16 persons and primarily used by transients for lodging with or without meals. [***101*,** 2024] (SIG-HOU)

3.3.145 Household Fire Alarm System. See 3.3.120, Fire Alarm System.

3.3.146 Hunt Group. A group of associated telephone lines within which an incoming call is automatically routed to an idle (not busy) telephone line for completion. (SIG-SSS)

3.3.147* Identified (as applied to equipment). Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular *Code* requirement. [**70,** 2023] (SIG-PRS)

3.3.148* Immediately (as used in Chapter 26). Performed without unreasonable delay. (SIG-SSS)

3.3.149* Impairment. An abnormal condition, during either a planned or emergency event, where a system, component, or function is inoperable. (SIG-FUN)

3.3.150* In Writing. A form of correspondence formatted as a letter or document that can be verified upon request. (SIG-FUN)

3.3.151 In-Building Mass Notification System. See 3.3.99, Emergency Communications System (ECS).

3.3.152 Initiating Device. A system component that originates transmission of a signal indicating a change-of-state condition. (SIG-IDS)

3.3.152.1 ***Analog Initiating Device (Sensor).*** An initiating device that transmits a signal indicating varying degrees of condition as contrasted with a conventional initiating device, which can only indicate an on–off condition. (SIG-IDS)

3.3.152.2* ***Automatic Extinguishing System Supervisory Device.*** A device that responds to abnormal conditions that could affect the proper operation of an automatic sprinkler system, other fire-extinguishing system(s) or fire-suppression system(s). (SIG-IDS)

3.3.152.3 ***Nonrestorable Initiating Device.*** A device in which the sensing element is designed to be destroyed in the process of operation. (SIG-IDS)

3.3.152.4 ***Restorable Initiating Device.*** A device in which the sensing element is not ordinarily destroyed in the process of operation, whose restoration can be manual or automatic. (SIG-IDS)

3.3.152.5 ***Supervisory Signal Initiating Device.*** An initiating device in which the change of state signals an off-normal condition that requires action in connection with guard tours or maintenance of related systems. (SIG-IDS)

3.3.153 Initiating Device Circuit. A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated. (SIG-PRO)

3.3.154 Inspection Personnel. See 3.3.213, Personnel.

3.3.155 Intelligibility. The quality or condition of being intelligible. (SIG-NAS)

3.3.156* Intelligible. Capable of being understood; comprehensible; clear. (SIG-NAS)

3.3.157 Interface.

3.3.157.1 ***Circuit Interface.*** A circuit component that interfaces initiating devices or control circuits, or both; notification appliances or circuits, or both; system control outputs; and other signaling line circuits to a signaling line circuit. (SIG-PRO)

3.3.157.1.1 ***Emergency Control Function Interface.*** The interface between the fire alarm system emergency control function interface device and the component controlling the emergency control function. (SIG-PRO)

3.3.157.1.2 ***Signaling Line Circuit Interface.*** A system component that connects a signaling line circuit to any combination of initiating devices, initiating device circuits, notification appliances, notification appliance circuits, system control outputs, and other signaling line circuits. (SIG-PRO)

3.3.157.2* ***Fire Alarm Control Interface.*** An interface that coordinates signals to and from the fire alarm system and other systems. (SIG-ECS)

3.3.158 Ionization Smoke Detection. See 3.3.290, Smoke Detection.

3.3.159 Leg Facility. The portion of a communications channel that connects not more than one protected premises to a primary or secondary trunk facility. The leg facility includes the portion of the signal transmission circuit from its point of connection with a trunk facility to the point where it is terminated within the protected premises at one or more transponders. (SIG-SSS)

3.3.160 Level Ceilings. See 3.3.42, Ceiling.

3.3.161 Life Safety Network. A type of combination system that transmits fire and emergency communications system data to at least one other life safety system. (SIG-PRO)

3.3.162 Line-Type Detector. See 3.3.79, Detector.

3.3.163 Living Area. Any normally occupiable space in a residential occupancy, other than sleeping rooms or rooms that are intended for combination sleeping/living, bathrooms, toilet compartments, kitchens, closets, halls, storage or utility spaces, and similar areas. [***101*****,** 2024] (SIG-HOU)

3.3.164 Loading Capacity. The maximum number of discrete elements of fire alarm systems permitted to be used in a particular configuration. (SIG-SSS)

3.3.165 Local Energy–Type Auxiliary Alarm System. See 3.3.234, Public Emergency Alarm Reporting System.

3.3.166* Local Operating Console (LOC). Equipment used by authorized personnel and emergency responders to activate and operate an in-building mass notification system. (SIG-ECS)

3.3.167 Lodging or Rooming House. A building or portion thereof that does not qualify as a one- or two-family dwelling, that provides sleeping accommodations for a total of 16 or fewer people on a transient or permanent basis, without personal care services, with or without meals, but without separate cooking facilities for individual occupants. [***101*****,** 2024] (SIG-HOU)

3.3.168 Loss of Power. The reduction of available voltage at the load below the point at which equipment can function as designed. (SIG-FUN)

3.3.169 Low-Power Radio Transmitter/Transceiver. Any device that communicates with associated control/receiving equipment or other transceivers by low-power radio signals. (SIG-PRO)

3.3.170 Maintenance. Work, including, but not limited to, repair, replacement, and service, performed to ensure that equipment operates properly. (SIG-TMS)

3.3.171 Malicious Alarm. See 3.3.332.1, Malicious Alarm.

Δ **3.3.172* Managed Facilities-Based Voice Network (MFVN).** A physical facilities-based network capable of transmitting real-time signals with formats unchanged that is managed, operated, and maintained by the regulated communications carrier to ensure service quality and reliability from the subscriber location to the supervising station via the public-switched telephone network (PSTN) or interconnection points with other MFVN peer networks. (SIG-SSS)

3.3.173 Manual Fire Alarm Box. See 3.3.12, Alarm Box.

3.3.174* Manufacturer's Published Instructions. Published installation and operating documentation provided for each product or component. The documentation includes directions and necessary information for the intended installation, maintenance, and operation of the product or component. (SIG-TMS)

3.3.175* Mass Notification Priority Mode. The mode of operation whereby all fire alarm occupant notification is superseded by emergency mass notification action. (SIG-ECS)

3.3.176* Mass Notification System. See 3.3.99.1.3, In-Building Mass Notification System. (SIG-PRO)

3.3.177 Master Box. See 3.3.12, Alarm Box.

3.3.178 Master Control Station (Two-Way Emergency Communications Systems for Rescue Assistance). A system component providing an operator interface to receive and view calls from remote call stations and initiate two-way communications between the master control station operator and persons at the call station location. (SIG-ECS)

3.3.179 Master Fire Alarm Control Unit. See 3.3.117, Fire Alarm Control Unit (FACU).

3.3.180* Minimum Hearing Distance. The closest distance that an occupant's ear can be to an audible appliance. (SIG-NAS)

3.3.181 Multi-Criteria Detector. See 3.3.79, Detector.

3.3.182 Multiple-Station Alarm. A single-station alarm capable of being interconnected to one or more additional alarms so that the actuation of one causes the appropriate alarm signal to operate in all interconnected alarms. (SIG-HOU)

3.3.183 Multiplexing. A signaling method characterized by simultaneous or sequential transmission, or both, and reception of multiple signals on a signaling line circuit, a transmission channel, or a communications channel, including means for positively identifying each signal. (SIG-SSS)

3.3.184 Multi-Sensor Detector. See 3.3.79, Detector.

3.3.185 Municipal Fire Alarm Box (Street Box). A publicly accessible alarm box. *(See 3.3.12, Alarm Box.)*

3.3.186 Municipal Fire Alarm System. See 3.3.120, Fire Alarm System.

3.3.187 Net-Centric Alerting System (NCAS). A net-centric alerting system incorporates web-based management and alert activation application through which all operators and administrators could gain access to the system's capabilities based on the users' permissions and the defined access policy. (SIG-ECS)

3.3.188 Network.

3.3.188.1 ***Wired Network (Public Emergency Alarm Reporting Systems).*** The method of communications used in a public emergency alarm reporting system that consists of two or more points that are connected by physical conductors. (SIG-PRS)

3.3.188.2 ***Wireless Network (Public Emergency Alarm Reporting Systems).*** The method of communications used in a public emergency alarm reporting system that consists of two or more points that are not connected by physical conductors. (SIG-PRS)

3.3.189 Network Architecture. The physical and logical design of a network, and the inherent ability of the design to carry data from one point to another. (SIG-ECS)

N **3.3.190* Network Connectable Equipment.** System components that connect to the internet or external systems through wired or wireless pathways using various protocols.

3.3.191 Noncontiguous Property. See 3.3.226, Property.

3.3.192* Nonrequired. A system component or group of components that is installed at the option of the owner, and is not installed due to a building or fire code requirement. (SIG-FUN)

3.3.193 Nonrestorable Initiating Device. See 3.3.152, Initiating Device.

3.3.194 Notification Appliance. A fire alarm system component such as a bell, horn, loudspeaker, visual notification appliance, or text display that provides audible, tactile, or visual outputs, or any combination thereof. (SIG-NAS)

3.3.194.1 ***Audible Notification Appliance.*** A notification appliance that alerts by the sense of hearing. (SIG-NAS)

3.3.194.1.1 ***Exit Marking Audible Notification Appliance.*** An audible notification appliance that marks building exits and areas of refuge by the sense of hearing for the purpose of evacuation or relocation. (SIG-NAS)

3.3.194.1.2* ***Textual Audible Notification Appliance.*** A notification appliance that conveys a stream of audible information. (SIG-NAS)

3.3.194.2 ***Tactile Notification Appliance.*** A notification appliance that alerts by the sense of touch or vibration. (SIG-NAS)

3.3.194.3 ***Visual Notification Appliance.*** A notification appliance that alerts by the sense of sight. (SIG-NAS)

3.3.194.3.1* ***Textual Visual Notification Appliance.*** A notification appliance that conveys a stream of visual information that displays an alphanumeric or pictorial message. (SIG-NAS)

3.3.195 Notification Appliance Circuit. A circuit or path directly connected to a notification appliance(s). (SIG-PRO)

3.3.196 Notification Zone. See 3.3.346, Zone.

3.3.197 Nuisance Alarm. See 3.3.332.2, Nuisance Alarm.

3.3.198* Observation. A suggested correction, improvement, or enhancement to the fire alarm or signaling system that is not considered to be an impairment or deficiency. (SIG-TMS)

3.3.199* Occupiable. A room or enclosed space designed for human occupancy. (SIG-FUN)

3.3.200 Occupiable Area. An area of a facility occupied by people on a regular basis. (SIG-FUN)

3.3.201* Octave Band. The bandwidth of a filter that comprises a frequency range of a factor of 2. (SIG-NAS)

3.3.201.1 ***One-Third Octave Band.*** The bandwidth of a filter that comprises a frequency range of a factor of $2^{1/3}$. (SIG-NAS)

3.3.202 Off-Hook. To access a communications network in preparation for connecting a telephone. (SIG-SSS)

3.3.203 One-Third Octave Band. See 3.3.201, Octave Band.

3.3.204 One-Way Emergency Communications System. See 3.3.99, Emergency Communications System (ECS).

3.3.205 On-Hook. To disconnect from a managed facilities-based voice network. (SIG-SSS)

3.3.206 Operating Mode.

3.3.206.1 ***Private Operating Mode.*** Audible or visual signaling only to those persons directly concerned with the implementation and direction of emergency action initiation and procedure in the area protected by the fire alarm system. (SIG-NAS)

3.3.206.2 ***Public Operating Mode.*** Audible or visual signaling to occupants or inhabitants of the area protected by the fire alarm system. (SIG-NAS)

3.3.207 Other Fire Detectors. See 3.3.79, Detector.

3.3.208* Ownership. Any property or building or its contents under legal control by the occupant, by contract, or by holding of a title or deed. (SIG-SSS)

3.3.209 Paging System. A system intended to page one or more persons by such means as voice over loudspeaker, coded audible signals or visual signals, or lamp annunciators. (SIG-PRO)

3.3.210 Path (Pathways). Any circuit, conductor, optical fiber, radio carrier, or other means connecting two or more locations. (SIG-PRO)

3.3.211 Pathway Survivability. The ability of any conductor, optical fiber, radio carrier, or other means for transmitting system information to remain operational during fire conditions. (SIG-ECS)

3.3.212 Permanent Visual Record (Recording). An immediately readable, not easily alterable, print, slash, or punch record of all occurrences of status change. (SIG-SSS)

3.3.213 Personnel.

N **3.3.213.1** ***Authorized Personnel.*** The property owner, or designated representative appointed or selected by the property owner, who performs certain duties. (SIG-FUN)

N **3.3.213.2** ***Emergency Personnel.*** Person(s) who have been trained in emergency response. (SIG-FUN)

3.3.213.3 ***Inspection Personnel.*** Individuals who conduct a visual examination of a system or portion thereof to verify that it appears to be in operating condition, in proper loca-

tion, and is free of physical damage or conditions that impair operation. (SIG-TMS)

3.3.213.4 ***Service Personnel.*** Individuals who perform those procedures, adjustments, replacement of components, system programming, and maintenance as described in the manufacturer's service instructions that can affect any aspect of the performance of the system. (SIG-TMS)

3.3.213.5 ***System Designer.*** Individual responsible for the development of fire alarm or signaling system plans and specifications in accordance with this Code. (SIG-FUN)

3.3.213.6 ***System Installer.*** Individual responsible for the proper installation of fire alarm or signaling systems in accordance with plans, specifications, and manufacturer's requirements. (SIG-FUN)

3.3.213.7 ***Testing Personnel.*** Individuals who perform procedures used to determine the status of a system as intended by conducting acceptance, reacceptance, or periodic physical checks on systems. (SIG-TMS)

3.3.214 Photoelectric Light Obscuration Smoke Detection. See 3.3.290, Smoke Detection.

3.3.215 Photoelectric Light-Scattering Smoke Detection. See 3.3.290, Smoke Detection.

3.3.216 Plant. One or more buildings under the same ownership or control on a single property. (SIG-SSS)

3.3.217 Pneumatic Rate-of-Rise Tubing Heat Detector. See 3.3.79, Detector.

3.3.218 Positive Alarm Sequence. An automatic sequence that results in an alarm signal, even when manually delayed for investigation, unless the system is reset. (SIG-PRO)

3.3.219 Power Supply. A source of electrical operating power, including the circuits and terminations connecting it to the dependent system components. (SIG-FUN)

3.3.220 Primary Battery (Dry Cell). A nonrechargeable battery requiring periodic replacement. (SIG-FUN)

3.3.221 Primary Trunk Facility. That part of a transmission channel connecting all leg facilities to a supervising or subsidiary station. (SIG-SSS)

3.3.222 Prime Contractor. The listed central station or listed alarm service local company that is contractually responsible for providing central station services to a subscriber as required by this Code. (SIG-SSS)

3.3.223 Private Operating Mode. See 3.3.206, Operating Mode.

3.3.224 Profound Hearing Loss. See 3.3.139, Hearing Loss.

3.3.225 Projected-Beam-Type Detector. See 3.3.79, Detector.

3.3.226 Property.

3.3.226.1 ***Contiguous Property.*** A single-owner or single-user protected premises on a continuous plot of ground, including any buildings thereon, that is not separated by a public thoroughfare, transportation right-of-way, property owned or used by others, or body of water not under the same ownership. (SIG-SSS)

3.3.226.2 ***Noncontiguous Property.*** An owner- or user-protected premises where two or more protected premises, controlled by the same owner or user, are separated by a public thoroughfare, body of water, transportation right-of-way, or property owned or used by others. (SIG-SSS)

3.3.227 Proprietary Supervising Station. See 3.3.306, Supervising Station.

3.3.228 Proprietary Supervising Station Alarm System. See 3.3.307, Supervising Station Alarm Systems.

3.3.229 Proprietary Supervising Station Service. See 3.3.308, Supervising Station Service.

3.3.230 Protected Premises. The physical location protected by a fire alarm system. (SIG-PRO)

3.3.231 Protected Premises (Local) Control Unit. See 3.3.117, Fire Alarm Control Unit (FACU).

3.3.232 Protected Premises (Local) Fire Alarm System. See 3.3.120, Fire Alarm System.

3.3.233 Public Address System. An electronic amplification system with a mixer, amplifier, and loudspeakers, used to reinforce a given sound and distributing the "sound" to the general public around a building. (SIG-ECS)

3.3.234 Public Emergency Alarm Reporting System. A system of alarm-initiating devices, transmitting and receiving equipment, and communications infrastructure — other than a public telephone network — used to communicate with the communications center to provide any combination of manual or auxiliary alarm service. (SIG-PRS)

3.3.234.1* ***Auxiliary Alarm System.*** A protected premises fire alarm system or other emergency system at the protected premises and the system used to connect the protected premises system to a public emergency alarm reporting system for transmitting an alarm to the communications center. (SIG-PRS)

3.3.234.1.1 ***Local Energy–Type Auxiliary Alarm System.*** An auxiliary system that employs a locally complete arrangement of parts, initiating devices, relays, power supply, and associated components to automatically activate a master box or auxiliary box over circuits that are electrically isolated from the public emergency alarm reporting system circuits. (SIG-PRS)

3.3.234.2 ***Type A Public Emergency Alarm Reporting System.*** A system in which an alarm from an alarm box is received and is retransmitted to an emergency response facility either manually or automatically. (SIG-PRS)

3.3.234.3 ***Type B Public Emergency Alarm Reporting System.*** A system in which an alarm from an alarm box is automatically transmitted to an emergency response facility and, if used, is transmitted to supplementary alerting devices. (SIG-PRS)

3.3.235 Public Operating Mode. See 3.3.206, Operating Mode.

3.3.236 Public Safety Agency. A fire, emergency medical services, or law enforcement agency. (SIG-ECS)

3.3.237 Public Safety Radio Enhancement System. A system installed to assure the effective operation of radio communication systems used by fire, emergency medical services, or law enforcement agencies. (SIG-ECS)

3.3.238 Public Safety Radio System. A radio communication system used by fire, emergency medical services, or law enforcement agencies. (SIG-ECS)

3.3.239 Public Switched Telephone Network. See 3.3.314, Switched Telephone Network.

3.3.240 Publicly Accessible Alarm Box. See 3.3.12, Alarm Box.

3.3.241* Qualified. A competent and capable person or company that has met the requirements and training for a given field acceptable to the authority having jurisdiction. (SIG-TMS)

3.3.242 Radiant-Energy-Sensing Fire Detector. See 3.3.79, Detector.

3.3.243 Radio Alarm Repeater Station Receiver (RARSR). A system component that receives radio signals and resides at a repeater station that is located at a remote receiving location. (SIG-SSS)

3.3.244 Radio Alarm Supervising Station Receiver (RASSR). A system component that receives data and annunciates that data at the supervising station. (SIG-SSS)

3.3.245 Radio Alarm System (RAS). A system in which signals are transmitted from a radio alarm transmitter (RAT) located at a protected premises through a radio channel to two or more radio alarm repeater station receivers (RARSR) and that are annunciated by a radio alarm supervising station receiver (RASSR) located at the supervising station. (SIG-SSS)

3.3.246 Radio Alarm Transmitter (RAT). A system component at the protected premises to which initiating devices or groups of devices are connected that transmits signals indicating a status change of the initiating devices. (SIG-SSS)

3.3.247 Radio Channel. See 3.3.52, Channel.

3.3.248 Radio Communications. See 3.3.66, Communications, Radio.

Δ **3.3.249 Radio Frequency.** A measurement representing the oscillation rate of the electromagnetic radiation spectrum or electromagnetic radio waves. [**1225,** 2022] (SIG-PRS)

3.3.250 Rate Compensation Detector. See 3.3.79, Detector.

3.3.251 Rate-of-Rise Detector. See 3.3.79, Detector.

3.3.252 Record Drawings. Drawings (as-built) that document the location of all devices, appliances, wiring sequences, wiring methods, and connections of the components of the system as installed. (SIG-FUN)

3.3.253 Record of Completion. A document that acknowledges the features of installation, operation (performance), service, and equipment with representation by the property owner, system installer, system supplier, service organization, and the authority having jurisdiction. (SIG-FUN)

3.3.254 Releasing Fire Alarm System. See 3.3.120, Fire Alarm System.

3.3.255 Releasing Service Fire Alarm Control Unit. See 3.3.117, Fire Alarm Control Unit (FACU).

3.3.256 Relocation. The directed movement of occupants from one area to another area within the same building. (SIG-PRO)

3.3.257* Remote Access. Communications between a remote device and a component of a fire alarm or signaling system. (SIG-PRO)

3.3.258 Remote Call Station (Two-Way Emergency Communications Systems for Rescue Assistance). A system component providing a call button used to alert a master control station operator of a person requiring assistance, capabilities providing hands-free two-way communications between the person and operator, and visual indication of both call activation and active two-way communications. (SIG-ECS)

3.3.259 Remote Supervising Station. See 3.3.306, Supervising Station.

3.3.260 Remote Supervising Station Alarm System. See 3.3.307, Supervising Station Alarm Systems.

3.3.261 Remote Supervising Station Service. See 3.3.308, Supervising Station Service.

3.3.262 Repeater Station. The location of the equipment needed to relay signals between supervising stations, subsidiary stations, and protected premises. (SIG-SSS)

3.3.263 Reset. A control function that attempts to return a system or device to its normal, nonalarm state. (SIG-FUN)

3.3.264 Residential Board and Care Occupancy. An occupancy used for lodging and boarding of four or more residents, not related by blood or marriage to the owners or operators, for the purpose of providing personal care services. [***101,*** 2024] (SIG-HOU)

3.3.265 Residential Occupancy. An occupancy that provides sleeping accommodations for purposes other than health care or detention and correctional. [***101,*** 2024] (SIG-HOU)

3.3.266* Response. Actions performed upon the receipt of a signal. (SIG-FUN)

3.3.266.1* *Alarm Response.* The response to the receipt of an alarm signal. (SIG-FUN)

3.3.266.2* *Pre-Alarm Response.* The response to the receipt of a pre-alarm signal. (SIG-FUN)

3.3.266.3* *Supervisory Response.* The response to the receipt of a supervisory signal. (SIG-FUN)

3.3.266.4* *Trouble Response.* The response to the receipt of a trouble signal. (SIG-FUN)

3.3.267 Response Time Index (RTI). A numerical value that represents the thermal response sensitivity of the sensing element in a heat detector, sprinkler, or other heat-sensing fire detection device to the fire environment in terms of gas temperature and velocity versus time. (*See B.3.3.3.7.*) (SIG-IDS)

3.3.268 Restorable Initiating Device. See 3.3.152, Initiating Device.

3.3.269 Risk Analysis. A process to characterize the likelihood, vulnerability, and magnitude of incidents associated with natural, technological, and manmade hazards and other emergencies that addresses scenarios of concern, their probability, and their potential consequences. (SIG-ECS)

3.3.270 Runner. A person other than the required number of operators on duty at central, supervising, or runner stations (or otherwise in contact with these stations) available for prompt

dispatching, when necessary, to the protected premises. (SIG-SSS)

3.3.271 Runner Service. The service provided by a runner at the protected premises, including restoration, resetting, and silencing of all equipment transmitting fire alarm or supervisory or trouble signals to an off-premises location. (SIG-SSS)

3.3.272 Secondary Trunk Facility. That part of a transmission channel connecting two or more, but fewer than all, leg facilities to a primary trunk facility. (SIG-SSS)

3.3.273 Selective Talk Mode. See 3.3.318, Talk Mode.

3.3.274 Service Personnel. See 3.3.213, Personnel.

3.3.275 Shapes of Ceilings. The shapes of ceilings can be classified as sloping or smooth. (SIG-IDS)

3.3.276* Shop Drawings. Documents that provide information pertaining to the system necessary for installation of a fire alarm and/or signaling system. (SIG-FUN)

3.3.277* Signal. An indication of a condition communicated by electrical, visible, visual, audible, wireless, or other means. (SIG-FUN)

3.3.277.1* ***Alarm Signal.*** A signal that results from the manual or automatic detection of an alarm condition. (SIG-FUN)

3.3.277.2 ***Carbon Monoxide Alarm Signal.*** A signal indicating a concentration of carbon monoxide at or above the alarm threshold that could pose a risk to the life safety of the occupants and that requires immediate action. (SIG-FUN)

3.3.277.3 ***Delinquency Signal.*** A signal indicating a supervisory condition and the need for action in connection with the supervision of guards or system attendants. (SIG-PRO)

3.3.277.4 ***Evacuation Signal.*** A distinctive alarm signal intended to be recognized by the occupants as requiring evacuation of the building. (SIG-PRO)

3.3.277.5* ***Fire Alarm Signal.*** A signal that results from the manual or automatic detection of a fire alarm condition. (SIG-FUN)

3.3.277.6* ***Guard's Tour Supervisory Signal.*** A signal generated when a guard on patrol has actuated a guard's tour reporting station. (SIG-PRO)

3.3.277.7* ***Pre-Alarm Signal.*** A signal that results from the detection of a pre-alarm condition. (SIG-FUN)

3.3.277.8 ***Restoration Signal.*** A signal that results from the return to normal condition of an initiating device, system element, or system. (SIG-FUN)

3.3.277.9* ***Supervisory Signal.*** A signal that results from the detection of a supervisory condition. (SIG-FUN)

3.3.277.10* ***Trouble Signal.*** A signal that results from the detection of a trouble condition. (SIG-FUN)

3.3.278 Signal Transmission Sequence. A DACT that obtains dial tone, dials the number(s) of the DACR, obtains verification that the DACR is ready to receive signals, transmits the signals, and receives acknowledgment that the DACR has accepted that signal before disconnecting (going on-hook). (SIG-SSS)

3.3.279 Signaling Line Circuit. A circuit path between any combination of addressable appliances or devices, circuit interfaces, control units, or transmitters over which multiple system input signals or output signals or both are carried. (SIG-PRO)

3.3.280 Signaling Line Circuit Interface. See 3.3.157, Interface.

3.3.281 Signaling System. A system consisting of one or more of the following: carbon monoxide detection equipment and system, supervising station alarm system, public emergency alarm reporting system, or emergency communications system. (SIG-PRO)

3.3.282 Signaling Zone. See 3.3.346, Zone.

3.3.283 Single-Station Alarm. A detector comprising an assembly that incorporates a sensor, control components, and an alarm notification appliance in one unit operated from a power source either located in the unit or obtained at the point of installation. (SIG-HOU)

3.3.284 Site-Specific Software. See 3.3.293, Software.

3.3.285* Sleeping Area. The area of a dwelling unit where the bedrooms or sleeping rooms are located. (SIG-HOU)

3.3.286 Sloping Ceiling. See 3.3.42, Ceiling.

3.3.287 Sloping Peaked-Type Ceiling. See 3.3.42, Ceiling.

3.3.288 Sloping Shed-Type Ceiling. See 3.3.42, Ceiling.

3.3.289 Smoke Alarm. A single or multiple-station alarm responsive to smoke. (SIG-HOU)

3.3.290 Smoke Detection.

3.3.290.1 ***Cloud Chamber Smoke Detection.*** The principle of using an air sample drawn from the protected area into a high-humidity chamber combined with a lowering of chamber pressure to create an environment in which the resultant moisture in the air condenses on any smoke particles present, forming a cloud. The cloud density is measured by a photoelectric principle. The density signal is processed and used to convey an alarm condition when it meets preset criteria. (SIG-IDS)

3.3.290.2* ***Ionization Smoke Detection.*** The principle of using a small amount of radioactive material to ionize the air between two differentially charged electrodes to sense the presence of smoke particles. The presence of smoke particles decreases the conductance of the air by reducing ion mobility, which will produce an alarm condition when it meets preset criteria. (SIG-IDS)

3.3.290.3* ***Photoelectric Light Obscuration Smoke Detection.*** The principle of using a light source and a photosensitive sensor onto which the principal portion of the source emissions is focused. When smoke particles enter the light path, some of the light is scattered and some is absorbed, thereby reducing the light reaching the receiving sensor. The light reduction signal is processed and used to convey an alarm condition when it meets preset criteria. (SIG-IDS)

3.3.290.4* ***Photoelectric Light-Scattering Smoke Detection.*** The principle of using a light source and a photosensitive sensor arranged so that the rays from the light source do not normally fall onto the photosensitive sensor. When smoke particles enter the light path, some of the light is scattered by reflection and refraction onto the sensor. The light signal

is processed and used to convey an alarm condition when it meets preset criteria. (SIG-IDS)

3.3.290.5* ***Video Image Smoke Detection (VISD).*** The principle of using automatic analysis of real-time video images to detect the presence of smoke. (SIG-IDS)

3.3.291 Smoke Detector. See 3.3.79, Detector.

3.3.292 Smooth Ceiling. See 3.3.44, Ceiling Surfaces.

3.3.293 Software. Programs, instruments, procedures, data, and the like that are executed by a central processing unit of a product and that influences the functional performance of that product. For the purpose of this Code, software is one of three types: executive software, site-specific software, and cybersecurity-related only software. (SIG-TMS)

Δ **3.3.293.1*** ***Executive Software.*** Control and supervisory program that manages the execution of all other programs and directly or indirectly causes the required functions of the product to be performed. (SIG-TMS)

Δ **3.3.293.2*** ***Site-Specific Software.*** Program that is separate from, but controlled by, the executive software that allows inputs, outputs, and system configuration to be selectively defined to meet the needs of a specific installation. (SIG-TMS)

N **3.3.293.3** ***Cybersecurity Software.*** Software that is included in a system element and arranged such that its inclusion or exclusion in no way affects the executive or site-specific software execution and whose purpose is to reduce the vulnerability of the system and/or equipment to cybersecurity attacks. (SIG-FUN)

3.3.294 Solid Joist Construction. See 3.3.44, Ceiling Surfaces.

3.3.295 Spacing. A horizontally measured dimension used as a criterion in determining the allowable coverage of devices. (SIG-FUN)

3.3.296* Spark. A moving particle of solid material that emits radiant energy due to either its temperature or the process of combustion on its surface. [**654,** 2020] (SIG-IDS)

3.3.297 Spark/Ember Detector. See 3.3.79, Detector.

3.3.298 Spark/Ember Detector Sensitivity. The number of watts (or the fraction of a watt) of radiant power from a point source radiator, applied as a unit step signal at the wavelength of maximum detector sensitivity, necessary to produce an alarm signal from the detector within the specified response time. (SIG-IDS)

3.3.299 Spot-Type Detector. See 3.3.79, Detector.

3.3.300 Stakeholder. Any individual, group, or organization that might affect, be affected by, or perceive itself to be affected by the risk. (SIG-ECS)

3.3.301 Stored-Energy Emergency Power Supply Systems (SEPSS). Equipment that receives electrical energy and then provides a means to store that energy in some form for later use in order to supply electrical energy when needed. (SIG-FUN)

3.3.302 Stratification. The phenomenon where the upward movement of smoke and gases ceases due to the loss of buoyancy. (SIG-IDS)

3.3.303 Subscriber. The recipient of a contractual supervising station signal service(s). In case of multiple, noncontiguous properties having single ownership, the term refers to each protected premises or its local management. (SIG-SSS)

3.3.304 Subsidiary Station. A subsidiary station is a normally unattended location that is remote from the supervising station and is linked by a communications channel(s) to the supervising station. Interconnection of signals on one or more transmission channels from protected premises with a communications channel(s) to the supervising station is performed at this location. (SIG-SSS)

3.3.305 Supervised Notification Appliance Control Circuit. An output circuit that is monitored for integrity and used exclusively to activate control equipment for notification appliance circuits. (SIG-FUN)

3.3.306 Supervising Station. A facility that receives signals from alarm systems and at which personnel are in attendance at all times to respond to these signals. (SIG-SSS)

3.3.306.1 ***Central Supervising Station.*** A supervising station that is listed for central station service and that also commonly provides less stringent supervising station services such as remote supervising services. (SIG-SSS)

3.3.306.2 ***Proprietary Supervising Station.*** A supervising station under the same ownership as the protected premises fire alarm system(s) that it supervises (monitors) and to which alarm, supervisory, or trouble signals are received and where personnel are in attendance at all times to supervise operation and investigate signals. (SIG-SSS)

3.3.306.3 ***Remote Supervising Station.*** A supervising station to which alarm, supervisory, or trouble signals or any combination of those signals emanating from protected premises fire alarm systems are received and where personnel are in attendance at all times to respond. (SIG-SSS)

3.3.307 Supervising Station Alarm Systems.

3.3.307.1 ***Central Station Service Alarm System.*** A system or group of systems in which the operations of circuits and devices are transmitted automatically to, recorded in, maintained by, and supervised from a listed central station that has competent and experienced servers and operators who, upon receipt of a signal, take such action as required by this Code. Such service is to be controlled and operated by a person, firm, or corporation whose business is the furnishing, maintaining, or monitoring of supervised alarm systems. (SIG-SSS)

3.3.307.2 ***Proprietary Supervising Station Alarm System.*** An installation of an alarm system that serves contiguous and noncontiguous properties, under one ownership, from a proprietary supervising station located at the protected premises, or at one of multiple noncontiguous protected premises, at which trained, competent personnel are in constant attendance. This includes the protected premises fire alarm system(s); proprietary supervising station; power supplies; signal-initiating devices; initiating device circuits; signal notification appliances; equipment for the automatic, permanent visual recording of signals; and equipment for initiating the operation of emergency building control services. (SIG-SSS)

3.3.307.3 ***Remote Supervising Station Alarm System.*** A protected premises fire alarm system (exclusive of any connected

to a public emergency reporting system) in which alarm, supervisory, or trouble signals are transmitted automatically to, recorded in, and supervised from a remote supervising station that has competent and experienced servers and operators who, upon receipt of a signal, take such action as required by this Code. (SIG-SSS)

3.3.308 Supervising Station Service.

3.3.308.1 ***Central Station Service.*** The use of a system or a group of systems including the protected premises fire alarm system(s) in which the operations of circuits and devices are signaled to, recorded in, and supervised from a listed central station that has competent and experienced operators who, upon receipt of a signal, take such action as required by this Code. Related activities at the protected premises, such as equipment installation, inspection, testing, maintenance, and runner service, are the responsibility of the central station or a listed alarm service local company. Central station service is controlled and operated by a person, firm, or corporation whose business is the furnishing of such contracted services or whose properties are the protected premises. (SIG-SSS)

3.3.308.2 ***Proprietary Supervising Station Service.*** The use of a system or a group of systems including the protected premises fire alarm system(s) in which the operations of circuits and devices are signaled to, recorded in, and supervised from a supervising station under the same ownership as the protected premises that has competent and experienced operators who, upon receipt of a signal, take such action as required by this Code. Related activities at the protected premises, such as equipment installation, inspection, testing, maintenance, and runner service, are the responsibility of the owner. Proprietary supervising station service is controlled and operated by the entity whose properties are the protected premises. (SIG-SSS)

3.3.308.3 ***Remote Supervising Station Service.*** The use of a system including the protected premises fire alarm system(s) in which the operations of circuits and devices are signaled to, recorded in, and supervised from a supervising station that has competent and experienced operators who, upon receipt of a signal, take such action as required by this Code. Related activities at the protected premises, such as equipment installation, inspection, testing, and maintenance, are the responsibility of the owner. (SIG-SSS)

3.3.309 Supervisory Service. The service required to monitor performance of guard tours and the operative condition of fixed suppression systems or other systems for the protection of life and property. (SIG-PRO)

3.3.310 Supervisory Signal. See 3.3.277, Signal.

3.3.311 Supervisory Signal Initiating Device. See 3.3.152, Initiating Device.

3.3.312 Supplementary. As used in this Code, *supplementary* refers to equipment or operations not required by this Code and designated as such by the authority having jurisdiction. (SIG-FUN)

3.3.313 Surge Protective Device (SPD). A protective device for limiting transient voltages by diverting or limiting surge current. (SIG-PRS)

3.3.314 Switched Telephone Network.

Δ **3.3.314.1** ***Loop Start Telephone Circuit.*** A loop start telephone circuit is an analog telephone circuit that supports loop start signaling as specified in either GR-506-CORE, *Signaling for Analog Interface,* or GR-909-CORE, *Generic Criteria for Fiber in the Loop Systems.* (SIG-SSS)

3.3.314.2 ***Public Switched Telephone Network.*** An assembly of communications equipment and telephone service providers that utilize managed facilities-based voice networks (MFVN) to provide the general public with the ability to establish communications channels via discrete dialing codes. (SIG-SSS)

3.3.315 System Operator. An individual trained to operate and/or initiate a mass notification system. (SIG-ECS)

3.3.316 System Unit. The active subassemblies at the supervising station used for signal receiving, processing, display, or recording of status change signals; a failure of one of these subassemblies causes the loss of a number of alarm signals by that unit. (SIG-SSS)

3.3.317 Tactile Notification Appliance. See 3.3.194, Notification Appliance.

3.3.318 Talk Mode. A means of communications within a building normally dedicated to emergency functions. Commonly referred to as firefighters' phones, but can also be used for communications with firefighters and/or fire wardens, including occupants, during an emergency, such as between a fire command center and a designated location, such as a stair, stairwell, or location of emergency equipment. (SIG-ECS)

3.3.318.1 ***Common Talk Mode.*** The ability to conference multiple telephones in a single conversation. This is similar to what was referred to as a party line. (SIG-ECS)

3.3.318.2 ***Selective Talk Mode.*** The ability for personnel at the fire command center to receive indication of incoming calls and choose which call to answer. This includes the ability to transfer between incoming calls and conference multiple phone locations. Selective calling can include the ability to initiate calls to emergency phone locations. (SIG-ECS)

3.3.319 Testing Personnel. See 3.3.213, Personnel.

3.3.320 Textual Audible Notification Appliance. See 3.3.194, Notification Appliance.

3.3.321 Textual Visual Notification Appliance. See 3.3.194, Notification Appliance.

3.3.322 Transmission Channel. See 3.3.52, Channel.

3.3.323 Transmitter. A system component that provides an interface between signaling line circuits, initiating device circuits, or control units and the transmission channel. (SIG-SSS)

3.3.324 Transponder. A multiplex alarm transmission system functional assembly located at the protected premises. (SIG-SSS)

3.3.325 Trouble Signal. See 3.3.277, Signal.

3.3.326 Two-Way Emergency Communications System. See 3.3.99, Emergency Communications System (ECS).

3.3.327 Type A Public Emergency Alarm Reporting System. See 3.3.234, Public Emergency Alarm Reporting System.

3.3.328 Type B Public Emergency Alarm Reporting System. See 3.3.234, Public Emergency Alarm Reporting System.

N **3.3.329* Unconditioned Area.** An enclosed area, room, or space without climate or HVAC controls. (SIG-IDS)

3.3.330 Unintentional Alarm. See 3.3.332.3, Unintentional Alarm.

3.3.331 Unknown Alarm. See 3.3.332.4, Unknown Alarm.

3.3.332* Unwanted Alarm. Any alarm that occurs that is not the result of a potentially hazardous condition. (SIG-FUN)

3.3.332.1 ***Malicious Alarm.*** An unwanted activation of an alarm initiating device caused by a person acting with malice. (SIG-FUN)

3.3.332.2* ***Nuisance Alarm.*** An unwanted activation of a signaling system or an alarm initiating device in response to a stimulus or condition that is not the result of a potentially hazardous condition. (SIG-FUN)

3.3.332.3 ***Unintentional Alarm.*** An unwanted activation of an alarm initiating device caused by a person acting without malice. (SIG-FUN)

3.3.332.4 ***Unknown Alarm.*** An unwanted activation of an alarm initiating device or system output function where the cause has not been identified. (SIG-FUN)

3.3.333 Uplink. The radio signal from the portable public safety subscriber transmitter to the base station receiver. (SIG-ECS)

3.3.334* Video Image Flame Detection (VIFD). The principle of using automatic analysis of real-time video images to detect the presence of flame. (SIG-IDS)

3.3.335 Video Image Smoke Detection (VISD). See 3.3.290, Smoke Detection.

3.3.336 Visual Notification Appliance. See 3.3.194, Notification Appliance.

3.3.337 Voice Message Priority. A scheme for prioritizing mass notification messages. (SIG-ECS)

N **3.3.338 Waterflow Alarm Device.** An attachment to the sprinkler system that detects a predetermined water flow and is connected to a fire alarm system to initiate an alarm condition or is used to mechanically or electrically initiate a fire pump or local audible or visual alarm. [**13,** 2025] (SIG-IDS)

3.3.339 WATS (Wide Area Telephone Service). Telephone company service allowing reduced costs for certain telephone call arrangements. In-WATS or 800-number service calls can be placed from anywhere in the continental United States to the called party at no cost to the calling party. Out-WATS is a service whereby, for a flat-rate charge, dependent on the total duration of all such calls, a subscriber can make an unlimited number of calls within a prescribed area from a particular telephone terminal without the registration of individual call charges. (SIG-SSS)

3.3.340 Wide-Area Mass Notification System. See 3.3.99, Emergency Communications System (ECS).

3.3.341 Wide-Area Signaling. Signaling intended to provide alerting or information to exterior open spaces, such as campuses, neighborhood streets, a city, a town, or a community. (SIG-NAS)

3.3.342 Wireless Control Unit. See 3.3.71, Control Unit.

3.3.343* Wireless Mesh Network (WMN) (as used in Chapter 26). A decentralized communications network made up of radio nodes organized in a mesh topology that does not rely on a pre-existing infrastructure. (SIG-SSS)

3.3.344 Wireless Protection System. A system or a part of a system that can transmit and receive signals without the aid of interconnection wiring. It can consist of either a wireless control unit or a wireless repeater. (SIG-PRO)

3.3.345 Wireless Repeater. A component used to relay signals among wireless devices, appliances, and control units. (SIG-PRO)

3.3.346 Zone. A defined area within the protected premises. A zone can define an area from which a signal can be received, an area to which a signal can be sent, or an area in which a form of control can be executed. (SIG-FUN)

3.3.346.1 ***Notification Zone.*** A discrete area of a building, or defined area outside a building, in which people are intended to receive common notification. (SIG-PRO)

3.3.346.2* ***Signaling Zone.*** An area consisting of one or more notification zones where identical signals are activated simultaneously. (SIG-ECS)

Chapter 4 Reserved

Chapter 5 Reserved

Chapter 6 Reserved

Chapter 7 Documentation

7.1 Application.

7.1.1 The documentation of the design, acceptance, and completion of new systems required under this Code shall comply with the minimum requirements of this chapter.

7.1.2 The documentation of the alteration, maintenance, and testing of existing systems shall comply with the minimum requirements of this chapter.

7.1.3* Where required by governing laws, codes, or standards, or other parts of this Code, the requirements of this chapter, or portions thereof, shall apply.

7.1.4 Unless noted in Chapter 29 or required by other governing laws, codes, or standards, the documentation requirements of this chapter shall not apply to Chapter 29.

7.1.5 This chapter outlines documentation requirements but does not prohibit additional documentation from being provided.

7.1.6 The requirements of Chapters 10, 11, 12, 14, 17, 18, 21, 23, 24, 26, and 27 shall apply unless otherwise noted in this chapter.

7.2* Minimum Required Documentation.

7.2.1* Where documentation is required by the authority having jurisdiction, the following list shall represent the minimum documentation required for new systems and additions or alterations to existing systems:

(1)* Written narrative providing intent and system description
(2) Riser diagram
(3) Floor plan layout showing locations of all devices, control equipment, and supervising station and shared communications equipment with each sheet showing the following:
  (a) Point of compass (north arrow)
  (b) A graphic representation of the scale used
  (c) Room use identification
  (d) Building features that will affect the placement of initiating devices and notification appliances
(4) Sequence of operation in either an input/output matrix or narrative form
(5) Equipment technical data sheets
(6) Manufacturers' published instructions, including operation and maintenance instructions
(7) Battery capacity and safety margin calculations (where batteries are provided)
(8) Voltage drop calculations for notification appliance circuits
(9) Mounting height elevation for wall-mounted devices and appliances
(10) Where occupant notification is required, minimum sound pressure levels that must be produced by the audible notification appliances in applicable covered areas
(11) Locations of alarm notification appliances, including candela ratings for visual alarm notification appliances
(12)* Pathway diagrams between the control unit and shared communications equipment within the protected premises
(13) Completed record of completion in accordance with 7.5.6
(14) For software-based systems, a copy of site-specific software, including specific instructions on how to obtain the means of system and software access (password)
(15) Record (as-built) drawings
(16) Records, record retention, and record maintenance in accordance with Section 7.7
(17) Completed record of inspection and testing in accordance with 7.6.6

7.2.2 System design documents shall identify the name and contact information of the system designer.

7.2.3 All fire alarm drawings shall use symbols described in NFPA 170 or other symbols acceptable to the authority having jurisdiction.

7.3 Design (Layout) Documentation.

7.3.1* The requirements of Section 7.3 shall apply only where required by other governing laws, codes, or standards; by other parts of this Code; or by project specifications or drawings.

7.3.2* Where required by governing laws, codes, or standards, or other parts of this Code, design (layout) documents shall be prepared prior to installing new systems and additions or alterations to existing systems.

7.3.3* Where required by governing laws, codes, or standards, or other parts of this Code, preliminary plans shall be created.

7.3.3.1 When a design professional is preparing design documents for a new fire alarm or emergency communications system, or modifying an existing system covered by this Code, preliminary bid documents shall be prepared in accordance with Section 7.3.

7.3.3.2 The design professional shall be qualified to prepare fire alarm design documents in accordance with 10.5.1.

7.3.3.3 Design documents shall incorporate performance criteria to ensure that the system will provide a beneficial component to the fire and life safety needs of the owner, occupants, and authority having jurisdiction.

7.3.3.4 Design documents shall clearly communicate the intended performance and functionality expected by all installing contractors.

7.3.3.5 For spaces designated as acoustically distinguishable spaces (ADS) in accordance with 18.4.12, the design professional shall coordinate with other design disciplines so that intelligibility of messages can be achieved utilizing the emergency communications equipment as specified in the design documents and available to contractors/installers.

7.3.3.6 Design documents shall indicate the pathway class designations in accordance with Section 12.3.

7.3.3.7 Design documents shall indicate the pathway survivability level designations in accordance with Section 12.4.

7.3.4 Notification.

7.3.4.1* The requirements of 7.3.4 shall apply only where required by other governing laws, codes, or standards, or by other parts of this Code.

7.3.4.2 Design documents shall include ambient sound pressure levels and audible design sound pressure levels in accordance with 18.4.1.5.4.

7.3.4.3 Analysis and design documentation for narrow band tone signaling shall be in accordance with 18.4.7.4.

7.3.4.4 The documentation of acoustically distinguishable spaces (ADS) shall be in accordance with 18.4.12.

7.3.4.5 Design documents shall specify the rooms and spaces that will have visual notification and those where visual notification will not be provided in accordance with 18.5.2.1.

7.3.4.6 Performance-based design alternatives for visual notification appliance design shall be in accordance with 18.5.5.9.2.

N **7.3.4.7** Design documentation for restricted audible mode operation (RAMO) notification, including the definition of the protected space, sound pressure levels, and staff requirements, shall comply with 18.4.8.

7.3.5 Detection.

7.3.5.1 Heat-Sensing Fire Detectors. Heat detection design documentation shall be provided in accordance with Section 17.6.

7.3.5.2 Smoke-Sensing Fire Detectors. Smoke detection design documentation shall be provided in accordance with Section 17.7.

7.3.5.3 Radiant Energy-Sensing Fire Detectors. Radiant energy detection design documentation shall be provided in accordance with Section 17.8.

7.3.5.4 Gas Detectors. Gas detection design documentation shall be provided in accordance with Section 17.10.

7.3.5.5 Carbon Monoxide Detectors. Carbon monoxide detector design documentation shall be provided in accordance with Section 17.14.

7.3.6* Risk Analysis Documentation.

7.3.6.1 When a risk analysis is required to be prepared, findings and considerations of the risk analysis shall be documented.

7.3.6.2 When determined by the stakeholders, security and protection of the risk analysis documentation shall be in accordance with 7.3.7 and Section 7.7.

7.3.6.3 The risk analysis documentation shall list the various scenarios evaluated and the anticipated outcomes.

7.3.6.4 Risk analyses for mass notification systems shall be documented in accordance with 7.3.6 and 24.3.12.

7.3.7* Performance-Based Design Documentation.

7.3.7.1 Performance-based design documentation for fire detection shall be in accordance with Section 17.3.

7.3.7.2 Performance-based design documentation for visual notification appliances shall be in accordance with 18.5.5.9.2.

7.3.7.3 A copy of approval documentation resulting from performance-based designs shall be included with the completion documentation in accordance with Section 7.5.

7.3.7.4 Performance-based design documentation for mass notification systems shall be in accordance with Section 24.12.

7.3.7.5 Performance-based design documentation for signaling line circuit zoning shall be in accordance with 23.6.1.4 and 23.6.1.5.

7.3.8 Emergency Response Plan Documentation.

7.3.8.1 When an emergency response plan is required to be prepared, such as for a mass notification system, findings of the plan shall be documented.

7.3.8.2 When identified by the stakeholders, security and protection of the emergency response plan documentation shall be in accordance with 7.7.3.

7.3.8.3 The emergency response plan shall document the various scenarios evaluated and the anticipated outcomes.

7.3.9 Evaluation Documentation.

7.3.9.1* Evaluation documentation shall include a signed statement(s) by the person responsible for the design attesting to the evaluation and the resultant technical decision and deeming it reliable and acceptable for the particular application.

7.3.9.2 A copy of the evaluation documentation shall be retained for the life of the system and be maintained with the documents required by 7.7.1.7.

7.4 Shop Drawings (Installation Documentation).

7.4.1* The requirements of Section 7.4 shall apply only where required by other governing laws, codes, or standards; by other parts of this Code; or by project specifications or drawings.

7.4.2* Shop drawings shall be drawn to an indicated scale, on sheets of uniform size, with a plan of each floor.

7.4.3 Shop drawings for fire alarm or emergency communications systems shall provide both of the following:

(1) Basic information
(2) The basis for the record (as-built) drawings required in accordance with 7.5.5

7.4.4 Shop drawings shall include the following information:

(1) Name of protected premises, owner, and occupant (where applicable)
(2) Name of installer or contractor
(3) Location of protected premises
(4) Device legend and symbols in accordance with NFPA 170, or other symbols acceptable to the authority having jurisdiction
(5) Date of issue and any revision dates

7.4.5 Floor plan drawings shall comply with both of the following:

(1) Be drawn to an indicated scale
(2) Include the following information, where applicable for the particular system:
    (a) Floor or level identification
    (b) Point of compass (indication of north)
    (c) Graphic scale
    (d) All walls and doors
    (e) All partitions extending to within 15 percent of the ceiling height (where applicable and when known)
    (f) Room and area descriptions
    (g) System devices/component locations
    (h) Locations of the system's primary power disconnecting means
    (i) Locations of monitor/control interfaces to other systems
    (j) System riser locations

(k) Type and number of system components/devices on each circuit, on each floor or level
(l) Type and quantity of conductors and conduit (if used) for each circuit
(m) Identification of any ceiling over 10 ft (3.0 m) in height where automatic fire detection is being proposed
(n) Details of ceiling geometries, including beams and solid joists, where automatic fire detection is being proposed
(o) Where known, acoustic properties of spaces
(p) Pathway class designations in accordance with Section 12.3, including the location of any end-of-line supervisory or power devices that are required by the pathway class
(q) Pathway survivability level designations in accordance with Section 12.4

7.4.6 System riser diagrams shall comply with both of the following:

(1) Be coordinated with the floor plans
(2) Include the following information, where applicable for the particular system:
(a) General arrangement of the system in building cross-section
(b) Number of risers
(c) Type and number of circuits in each riser
(d) Type and number of system components/devices on each circuit, on each floor or level
(e) Number of conductors for each circuit
(f) Pathway class designation in accordance with Section 12.3, including the location of any end-of-line supervisory or power devices that are required by the pathway class
(g)* Pathway survivability level designations in accordance with Section 12.4

Δ 7.4.7 Control Unit Diagrams.

N **7.4.7.1** Control unit diagrams shall be provided for all control equipment (i.e., equipment listed as either a control unit or control unit accessory), power supplies, battery chargers, and annunciators.

N **7.4.7.2** Control unit diagrams shall include the following information:

(1) Identification of the control equipment depicted
(2) Location(s) of control equipment
(3) All field wiring terminals and terminal identifications
(4) All circuits connected to field wiring terminals and circuit identifications
(5) All indicators and manual controls
(6) Field connections to supervising station signaling equipment, releasing equipment, or emergency safety control interfaces, where provided

7.4.8 Typical wiring diagrams shall be provided for all initiating devices, notification appliances, remote indicators, annunciators, remote test stations, and end-of-line and power supervisory devices.

7.4.9* A narrative description or input/output matrix of operation shall be provided to describe the sequence of operation.

7.4.10 System calculations shall be included as follows:

(1) Battery calculations
(2) Notification appliance circuit voltage drop calculations
(3) Other required calculations, such as line resistance calculations, where required

7.5 Completion Documentation.

7.5.1* The requirements of Section 7.5 shall apply only where required by other governing laws, codes, or standards; by other parts of this Code; or by project specifications or drawings.

7.5.2 Before requesting final approval of the installation, if required by the authority having jurisdiction, the installing contractor shall furnish a written statement stating that the system has been installed in accordance with approved plans and tested in accordance with the manufacturer's published instructions and the appropriate NFPA requirements.

7.5.3 Delivery.

7.5.3.1 All systems, including new systems and additions or alterations to existing systems, shall include the following documentation:

(1)* An owner's manual and manufacturer's published instructions covering all system equipment
(2) Record (as-built) drawings in accordance with 7.5.5
(3) A completed record of completion form in accordance with 7.5.6
(4) For software-based systems, record copy of the site-specific software in accordance with 7.5.7

7.5.3.2 The documentation as stated in 7.5.3.1 shall be delivered to the owner or the owner's representative upon final acceptance of the system.

7.5.4 For new emergency communications systems, an owner's manual containing the following documentation shall be provided:

(1) Detailed narrative description of the system inputs, evacuation signaling, ancillary functions, annunciation, intended sequence of operations, expansion capability, application considerations, and limitations
(2) Written sequence of operation for the system including an operational input/output matrix
(3) Operator instructions for basic system operations, including alarm acknowledgment, system reset, interpretation of system output (LEDs, CRT display, and printout), operation of manual evacuation signaling and ancillary function controls, and change of printer paper
(4) Detailed description of routine maintenance and testing as required and recommended and as would be provided under a maintenance contract, including testing and maintenance instructions for each type of device installed, which includes the following:
(a) Listing of the individual system components that require periodic testing and maintenance
(b) Step-by-step instructions detailing the requisite testing and maintenance procedures, and the intervals at which those procedures are to be performed, for each type of device installed
(c) Schedule that correlates the testing and maintenance procedures that are required by this section
(5) Service directory, including a list of names and telephone numbers of those who provide service for the system
(6) Product data sheets for all system equipment

7.5.5 Record Drawings (As-Builts).

7.5.5.1 Record drawings shall consist of current updated shop drawings reflecting the actual installation of all system equipment, components, and wiring.

7.5.5.2* A sequence of operations in input/output matrix or narrative form shall be provided with the record drawings to reflect actual programming at the time of completion.

7.5.5.3 Where necessary, revised calculations in accordance with 7.4.10 shall be provided depicting any changes due to installation conditions.

7.5.5.4 Record drawings shall be turned over to the owner with a copy placed inside the documentation cabinet in accordance with Section 7.7.

7.5.5.5* Record drawings shall include approval documentation resulting from variances, performance-based designs, risk analyses, and other system evaluations or variations.

7.5.6 Record of Completion.

7.5.6.1* The record of completion shall be documented in accordance with 7.5.6 using either the record of completion forms, Figure 7.8.2(a) through Figure 7.8.2(f), or an alternative document that contains only the elements of Figure 7.8.2(a) through Figure 7.8.2(f) applicable to the installed system.

Δ **7.5.6.2* Record of Completion Documentation.**

N **7.5.6.2.1** The record of completion documentation shall be completed by the installing contractor and submitted to the authority having jurisdiction and the owner at the conclusion of the job.

N **7.5.6.2.2** The record of completion documentation shall be permitted to be part of the written statement required in 7.5.2 and part of the documents that support the requirements of 7.5.8.

N **7.5.6.2.3** When more than one contractor has been responsible for the installation, each contractor shall complete the portions of the documentation for which that contractor has responsibility.

7.5.6.3* The preparation of the record of completion documentation shall be the responsibility of the qualified and experienced person in accordance with 10.5.2.

7.5.6.4 The record of completion documentation shall be updated in accordance with 7.5.6.6 to reflect all system additions or modifications.

7.5.6.5 The updated copy of the record of completion documents shall be maintained in a documentation cabinet in accordance with 7.7.2.

7.5.6.6 Revisions.

Δ **7.5.6.6.1** All modifications made after the initial installation shall be recorded on a revised version of the original completion documents.

N **7.5.6.6.2** The revised version of the original documents shall serve as a supplement to the original, unaltered completion documents.

7.5.6.6.3 The revised record of completion document shall include a revision date.

7.5.6.6.4* Where the original or the latest overall system record of completion cannot be obtained, a new system record of completion shall be provided that documents the system configuration as discovered during the current project's scope of work.

7.5.6.7 Electronic Record of Completion.

7.5.6.7.1 Where approved by the authority having jurisdiction, the record of completion shall be permitted to be filed electronically instead of on paper.

7.5.6.7.2 If filed electronically, the record of completion document shall comply with both of the following:

(1) Be accessible with standard software
(2) Be backed up

7.5.7 Site-Specific Software.

7.5.7.1 For software-based systems, a copy of the site-specific software shall be provided to the system owner or owner's designated representative.

7.5.7.1.1 For all software that connects to and is part of the building life safety network components, the software security access or the means of obtaining the software security access shall be provided to the owner or the owner's designated representative.

7.5.7.1.2 The site-specific software documentation shall include both the user passcode and either the system programming password or specific instructions on how to obtain the programming password from the system manufacturer.

7.5.7.1.3 The passwords provided shall enable currently certified qualified programming personnel to access, edit, modify, and add to the existing system's site-specific software.

7.5.7.2 A copy of the site-specific software shall be stored onsite in nonvolatile memory.

7.5.8* Verification of Compliant Installation.

7.5.8.1 Where required by the authority having jurisdiction, compliance of the completed installation with the requirements of this Code shall be certified by a qualified and impartial third-party organization acceptable to the authority having jurisdiction.

7.5.8.2 Verification of compliant installation shall be performed according to testing requirements and procedures specified in 14.4.1 and 14.4.2.

Δ **7.5.8.3** Verification shall ensure the following:

(1) All components and functions are installed and operate per the approved plans and sequence of operation.
(2) All required system documentation is complete and is archived on site.
(3) Written confirmation has been provided that any required corrective actions have been completed.

N **7.5.8.4** Verification for new supervising station systems shall comply with both of the following:

(1) Ascertain proper arrangement, transmission, and receipt of all signals required to be transmitted off-premises
(2) Installation to meet requirements of 14.4.1 and 14.4.2

N **7.5.8.5** Verification for existing supervising station systems that are extended, modified, or reconfigured shall comply with both of the following:

(1) Ascertain proper arrangement, transmission, and receipt of all signals required to be transmitted off-premises
(2) Complete reacceptance testing in accordance with Chapter 14

7.5.9 Documentation of central station service shall be in accordance with 26.3.4.

7.5.10 Documentation of remote station service shall be in accordance with 26.5.2.

7.6 Inspection, Testing, and Maintenance Documentation.

7.6.1 Test plan documentation shall be provided in accordance with 14.2.10.

7.6.2 Acceptance testing documentation shall be provided in accordance with 14.6.1.

7.6.3 Reacceptance test documentation shall be provided in accordance with 14.6.1.

7.6.4 Periodic inspection and testing documentation shall be provided in accordance with 14.6.2 through 14.6.4.

7.6.5 Impairment documentation shall be provided in accordance with Section 10.21.

7.6.6 Record of Inspection and Testing. The record of all inspections, testing, and maintenance as required by 14.6.2.5 shall be documented using either the record of inspection and testing forms, Figure 7.8.2(g) through Figure 7.8.2(l), or an alternative record that includes all the applicable information shown in Figure 7.8.2(g) through Figure 7.8.2(l).

N **7.6.7 Network Connectable Equipment Maintenance Plan.**

N **7.6.7.1 Electronic Access Credentials.**

N **7.6.7.1.1*** Maintenance plans for network connectable equipment shall identify all accounts, personnel, and organizations with electronic access credentials that could be used by a cybersecurity threat actor.

N **7.6.7.1.2** Personnel or organizations with electronic access credentials shall be reviewed annually to maintain least privilege access or to eliminate access where it is no longer required.

N **7.6.7.2 Access Logs.**

N **7.6.7.2.1*** The owner shall maintain access logs for network connectable equipment that supports remote access.

N **7.6.7.2.2** The owner shall review access logs at least annually and compare them to the access credentials used in the maintenance records to ensure previous access has been approved.

7.7 Records, Record Retention, and Record Maintenance.

7.7.1 Records.

7.7.1.1 A complete record of the tests and operations of each system shall be kept until the next test and for 1 year thereafter unless more stringent requirements are required elsewhere in this Code.

Δ **7.7.1.2*** The records shall be available for examination and, if required, reported to the authority having jurisdiction.

N **7.7.1.3** Archiving of records by any means shall be permitted if hard copies of the records can be provided promptly when requested.

7.7.1.4 If off-premises monitoring is provided, records of all signals, tests, and operations recorded at the supervising station, including the public emergency alarm reporting system, shall be maintained by the off-premise monitoring service provider for not less than 1 year unless more stringent requirements are required elsewhere in this Code.

7.7.1.5 Required documents regarding system design and function shall be maintained for the life of the system.

7.7.1.6 The emergency communications system and fire alarm system as-built plans and other related documentation shall be permitted to be maintained together, including the appearance of both systems on the same drawings.

7.7.1.7 Revisions and alterations to systems shall be recorded and records maintained with the original system design documents.

7.7.2* Document Accessibility.

7.7.2.1 With every new system, a documentation cabinet shall be installed at the system control unit or at another approved location at the protected premises.

7.7.2.2 The documentation cabinet shall be sized so that it can contain all necessary documentation.

Δ **7.7.2.3** All record documentation shall be stored in a dedicated documentation cabinet.

N **7.7.2.4** Record documentation shall not be stored in any control unit enclosure.

7.7.2.5 Where the documentation cabinet is not in the same location as the system control unit, its location shall be identified at the system control unit.

7.7.2.6 The documentation cabinet shall be prominently labeled SYSTEM RECORD DOCUMENTS.

7.7.2.7* The building owner or the building owner's representative shall, on an annual basis, review any electronic documentation media formats and associated interfacing hardware for compatibility and update, if necessary.

7.7.2.8 The contents of the cabinet shall be accessible by authorized personnel only.

7.7.2.9 Emergency communications system and fire alarm system record documentation shall be permitted to be maintained together in the same documentation cabinet.

7.7.3 Document Security.

7.7.3.1 Security for system's documentation shall be determined by the stakeholders.

7.7.3.2* Where such documents cannot be protected from public access, it shall be permitted to remove sensitive information from record documents provided the owner retains complete documentation that will be made accessible to the authority having jurisdiction at an owner designated location.

7.8 Forms.

7.8.1 General.

7.8.1.1* The requirements of Section 7.8 shall apply only where required by other governing laws, codes, or standards; by other parts of this Code; or by project specifications or drawings.

7.8.1.2 Where specific forms are required by other governing laws, codes, or standards; by other parts of this Code; or by project specifications or drawings, form layouts and content that differ from those in Section 7.8 shall be permitted provided that the minimum required content is included.

7.8.2 Forms for Documentation. Forms for documentation shall be as follows:

(1)* Unless otherwise permitted or required in 7.5.6 or 7.8.1.2, Figure 7.8.2(a) through Figure 7.8.2(f) shall be used to document the record of completion and inspection.

(2)* Unless otherwise permitted or required in 7.6.6 or 7.8.1.2, Figure 7.8.2(g) through Figure 7.8.2(l) shall be used to document the record of inspection and testing.

(3) Where a form is required by the AHJ to document the installation and inspection of a household fire alarm system or single- or multiple-station alarms, Figure 7.8.2(m) shall be permitted to be used to document the record of completion and inspection.

SYSTEM RECORD OF COMPLETION

This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.
Attach additional sheets, data, or calculations as necessary to provide a complete record.

Form Completion Date: _____ Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____
Address: _____
Description of property: _____
Name of property representative: _____
Address: _____
Phone: _____ Fax: _____ E-mail: _____

2. INSTALLATION, SERVICE, TESTING, AND MONITORING INFORMATION

Installation contractor: _____
Address: _____
Phone: _____ Fax: _____ E-mail: _____
Service organization: _____
Address: _____
Phone: _____ Fax: _____ E-mail: _____
Testing organization: _____
Address: _____
Phone: _____ Fax: _____ E-mail: _____
Effective date for test and inspection contract: _____
Monitoring organization: _____
Address: _____
Phone: _____ Fax: _____ E-mail: _____
Account number: _____ Phone line 1: _____ Phone line 2: _____
Means of transmission: _____
Entity to which alarms are retransmitted: _____ Phone: _____

3. DOCUMENTATION

On-site location of the required record documents and site-specific software: _____

4. DESCRIPTION OF SYSTEM OR SERVICE

This is a: ☐ New system ☐ Modification to existing system Permit number: _____
NFPA 72 edition: _____

4.1 Control Unit

Manufacturer: _____ Model number: _____

4.2 Software and Firmware

Firmware revision number: _____

4.3 Alarm Verification

☐ This system does not incorporate alarm verification.
Number of devices subject to alarm verification: _____ Alarm verification set for _____ seconds

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Δ **FIGURE 7.8.2(a) System Record of Completion.**

SYSTEM RECORD OF COMPLETION *(continued)*

5. SYSTEM POWER

5.1 Control Unit

5.1.1 Primary Power

Input voltage of control panel: _____ Control panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Branch circuit disconnecting means location: _____ Number: _____

5.1.2 Secondary Power

Type of secondary power: _____

Location, if remote from the plant: _____

Calculated capacity of secondary power to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

5.2 Control Unit

❑ This system does not have power extender panels

❑ Power extender panels are listed on supplementary sheet A

6. CIRCUITS AND PATHWAYS

Pathway Type	Dual Pathway	Separate Pathway	Class	Survivability Level
Signaling Line				
Device Power				
Initiating Device				
Notification Appliance				
Other (specify):				

7. REMOTE ANNUNCIATORS

Type	Location

8. INITIATING DEVICES

Type	Quantity	Addressable or Conventional	Alarm or Supervisory	Sensing Technology
Manual Pull Stations				
Smoke Detectors				
Duct Smoke Detectors				
Heat Detectors				
Gas Detectors				
Carbon Monoxide Detectors				
Waterflow Switches				
Tamper Switches				

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Δ **FIGURE 7.8.2(a)** *Continued*

SYSTEM RECORD OF COMPLETION *(continued)*

9. NOTIFICATION APPLIANCES

Type	Quantity	Description	Connected to a Notification Appliance Circuit (NAC)	Connected to a Signaling Line Circuit (SLC)
Audible				
Visual				
Combination Audible and Visual				

10. SYSTEM CONTROL FUNCTIONS

Type	Quantity
Hold-Open Door Releasing Devices	
HVAC Shutdown	
Fire/Smoke Dampers	
Door Unlocking	
Elevator Recall	
Elevator Shunt Trip	

11. INTERCONNECTED SYSTEMS

❑ This system does not have interconnected systems.

❑ Interconnected systems are listed on supplementary sheet _____ .

12. CERTIFICATION AND APPROVALS

12.1 System Installation Contractor

This system as specified herein has been installed according to all NFPA standards cited herein.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

12.2 System Operational Test

This system as specified herein has tested according to all NFPA standards cited herein.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

12.3 Acceptance Test

Date and time of acceptance test: _____

Installing contractor representative: _____

Testing contractor representative: _____

Property representative: _____

AHJ representative: _____

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Δ **FIGURE 7.8.2(a)** *Continued*

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes systems and components specific to emergency communications systems.
This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Form Completion Date: _____ Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. DESCRIPTION OF SYSTEM OR SERVICE

❑ Fire alarm with in-building fire emergency voice alarm communications system (EVAC)

❑ Mass notification system

❑ Combination system, with the following components:

❑ Fire alarm ❑ EVACS ❑ MNS ❑ Two-way, in-building, emergency communications system

❑ Other (specify): _____

NFPA 72 edition: _____ Additional description of system(s): _____

_____

2.1 In-Building Fire Emergency Voice Alarm Communications System

Manufacturer: _____ Model number: _____

Number of single voice alarm channels: _____ Number of multiple voice alarm channels: _____

Number of loudspeakers: _____ Number of loudspeaker circuits: _____

Location of amplification and sound processing equipment: _____

_____

_____

Location of paging microphone stations:

Location 1: _____

Location 2: _____

Location 3: _____

2.2 Mass Notification System

2.2.1 System Type:

❑ In-building MNS–combination

❑ In-building MNS ❑ Wide-area MNS ❑ Distributed recipient MNS

❑ Other (specify): _____

Δ FIGURE 7.8.2(b) Emergency Communications System Supplementary Record of Completion.

EMERGENCY COMMUNICATIONS SYSTEMS
SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. DESCRIPTION OF SYSTEM OR SERVICE *(continued)*

2.2.2 System Features:

❑ Combination fire alarm/MNS ❑ MNS autonomous control unit ❑ Wide-area MNS to regional national alerting interface

❑ Local operating console (LOC) ❑ Distributed-recipient MNS (DRMNS) ❑ Wide-area MNS to DRMNS interface

❑ Wide-area MNS to high power loudspeaker array (HPLA) interface ❑ In-building MNS to wide-area MNS interface

❑ Other (specify): _____

2.2.3 MNS Local Operating Consoles

Location 1: _____

Location 2: _____

Location 3: _____

2.2.4 High Power Loudspeaker Arrays

Number of HPLA loudspeaker initiation zones: _____

Location 1: _____

Location 2: _____

Location 3: _____

2.2.5 Mass Notification Devices

Combination fire alarm/MNS visual devices: _____ MNS-only visual devices: _____

Textual signs: _____ Other (describe): _____

Supervision class: _____

2.2.6 Special Hazard Notification

❑ This system does not have special suppression predischarge notification.

❑ MNS systems DO NOT override notification appliances required to provide special suppression predischarge notification.

3. TWO-WAY EMERGENCY COMMUNICATIONS SYSTEMS

3.1 Telephone System

Number of telephone jacks installed: _____ Number of warden stations installed: _____

Number of telephone handsets stored on site: _____

Type of telephone system installed: ❑ Electrically powered ❑ Sound powered

3.2 Area of Refuge Emergency Communications Systems

Number of stations: _____ Location of central control point: _____

Days and hours when central control point is attended: _____

Location of alternate control point: _____

Days and hours when alternate control point is attended: _____

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Δ **FIGURE 7.8.2(b)** *Continued*

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

3. TWO-WAY EMERGENCY COMMUNICATIONS SYSTEMS *(continued)*

3.3 Elevator Emergency Communications Systems

Number of elevators with stations: _____ Location of central control point: _____

Days and hours when central control point is attended: _____

Location of alternate control point: _____

Days and hours when alternate control point is attended: _____

3.4 Other Two-Way Communications System

Describe: _____

4. CONTROL FUNCTIONS

This system activates the following control functions specific to emergency communications systems:

Type	Quantity
Mass Notification Override of Alarm Signaling Systems or Appliances	

See Main System Record of Completion for additional information, certifications, and approvals.

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Δ **FIGURE 7.8.2(b)** *Continued*

POWER SYSTEMS
SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes systems and components specific to power systems that incorporate generators, SEPSS systems, remote battery systems, or other complex power systems. This form is to be completed by the system installation contractor at the time of system acceptance and approval. It shall be permitted to modify this form as needed to provide a more complete and/or clear record. Insert N/A in all unused lines.

Form Completion Date: _____ Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. SYSTEM POWER

2.1 Control Unit

2.1.1 Primary Power

Input voltage of control panel: _____ Control panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panelboard): _____

Disconnecting means location: _____

2.1.2 Engine-Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.1.3 Stored-Energy Emergency Power Supply Systems

Equipment powered by SEPSS system: _____

Location of SEPSS system: _____

Calculated capacity of SEPSS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.1.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.2 In-Building Fire Emergency Voice Alarm Communications System or Mass Notification System

2.2.1 Primary Power

Input voltage of EVACS or MNS panel: _____ EVACS or MNS panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panelboard): _____

Disconnecting means location: _____

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Δ FIGURE 7.8.2(c) Power Systems Supplementary Record of Completion.

POWER SYSTEMS
SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. SYSTEM POWER *(continued)*

2.2.2 Engine-Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.2.3 Stored-Energy Emergency Power Supply Systems

Equipment powered by SEPSS system: _____

Location of SEPSS system: _____

Calculated capacity of SEPSS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.2.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.3 Notification Appliance Power Extender Panels

❑ This system does not have power extender panels.

2.3.1 Primary Power

Input voltage of power extender panel(s): _____ Power extender panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panelboard): _____

Disconnecting means location: _____

2.3.2 Engine Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.3.3 Stored-Energy Emergency Power Supply Systems

Equipment powered by SEPSS system: _____

Location of SEPSS system: _____

Calculated capacity of SEPSS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.3.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

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Δ **FIGURE 7.8.2(c)** *Continued*

POWER SYSTEMS
SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. SYSTEM POWER *(continued)*

2.4 Supervising Station Transmission Equipment

❑ This system does not use transmission equipment within the building powered by any other source than the alarm system control unit.

2.4.1 Primary Power

Input voltage of shared transmission equipment: _____

Shared transmission equipment panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panelboard): _____

Disconnecting means location: _____

2.4.2 Engine Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.4.3 Energy Storage Systems

Equipment powered by ESS system: _____

Calculated capacity of ESS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.4.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

See Main System Record of Completion for additional information, certifications, and approvals.

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Δ FIGURE 7.8.2(c) *Continued*

NOTIFICATION APPLIANCE POWER PANEL SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes a list of types and locations of notification appliance power extender panels.
This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Form Completion Date: _____ Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. NOTIFICATION APPLIANCE POWER EXTENDER PANELS

Make and Model	Location	Area Served	Power Source

See Main System Record of Completion for additional information, certifications, and approvals.

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Δ FIGURE 7.8.2(d) Notification Appliance Power Panel Supplementary Record of Completion.

INTERCONNECTED SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes a list of types and locations of systems that are interconnected to the main system.
This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Form Completion Date: _____ Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. INTERCONNECTED SYSTEMS

Description	Location	Purpose

See Main System Record of Completion for additional information, certifications, and approvals.

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Δ **FIGURE 7.8.2(e) Interconnected Systems Supplementary Record of Completion.**

DEVIATIONS FROM ADOPTED CODES AND STANDARDS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It enables the designer and/or installer to document and justify deviations from accepted codes or standards.
This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Form Completion Date: _____ Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. DEVIATIONS FROM ADOPTED CODES OR STANDARDS

Description	Purpose

See Main System Record of Completion for additional information, certifications, and approvals.

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Δ FIGURE 7.8.2(f) Deviations from Adopted Codes and Standards Supplementary Record of Completion.

SYSTEM RECORD OF INSPECTION AND TESTING

This form is to be completed by the system inspection and testing contractor at the time of a system test.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.
Attach additional sheets, data, or calculations as necessary to provide a complete record.

Inspection/Test Start Date/Time: _____ Inspection/Test Completion Date/Time: _____

Supplemental Form(s) Attached: _____ (yes/no)

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

Description of property: _____

Name of property representative: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

2. TESTING AND MONITORING INFORMATION

Testing organization: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Monitoring organization: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Account number: _____ Phone line 1: _____ Phone line 2: _____

Means of transmission: _____

Entity to which alarms are retransmitted: _____ Phone: _____

3. DOCUMENTATION

Onsite location of the required record documents and site-specific software: _____

4. DESCRIPTION OF SYSTEM OR SERVICE

4.1 Control Unit

Manufacturer: _____ Model number: _____

4.2 Software Firmware

Firmware revision number: _____

4.3 System Power

4.3.1 Primary (Main) Power

Nominal voltage: _____ Amps: _____ Location: _____

Overcurrent protection type: _____ Amps: _____ Disconnecting means location: _____

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Δ **FIGURE 7.8.2(g) System Record of Inspection and Testing.**

SYSTEM RECORD OF INSPECTION AND TESTING *(continued)*

4. DESCRIPTION OF SYSTEM OR SERVICE *(continued)*

4.3.2 Secondary Power

Type: _____ Location: _____

Battery type (if applicable): _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

5. NOTIFICATIONS MADE PRIOR TO TESTING

Monitoring organization	Contact: _____	Time: _____
Building management	Contact: _____	Time: _____
Building occupants	Contact: _____	Time: _____
Authority having jurisdiction	Contact: _____	Time: _____
Other, if required	Contact: _____	Time: _____

6. TESTING RESULTS

6.1 Control Unit and Related Equipment

Description	Visual Inspection	Functional Test	Comments
Control unit	❑	❑	
Lamps/LEDs/LCDs	❑	❑	
Fuses	❑	❑	
Trouble signals	❑	❑	
Disconnect switches	❑	❑	
Ground-fault monitoring	❑	❑	
Supervision	❑	❑	
Local annunciator	❑	❑	
Remote annunciators	❑	❑	
Remote power panels	❑	❑	

6.2 Secondary Power

Description	Visual Inspection	Functional Test	Comments
Battery condition	❑	❑	
Load voltage	❑	❑	
Discharge test	❑	❑	
Charger test	❑	❑	
Remote panel batteries	❑	❑	
Batteries marked with date of manufacture	❑	❑	

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Δ **FIGURE 7.8.2(g)** *Continued*

SYSTEM RECORD OF INSPECTION AND TESTING *(continued)*

6. TESTING RESULTS *(continued)*

6.3 Alarm and Supervisory Alarm Initiating Device

Attach supplementary device test sheets for all initiating devices.

6.4 Notification Appliances

Attach supplementary appliance test sheets for all notification appliances.

6.5 Interface Equipment

Attach supplementary interface component test sheets for all interface components.

Circuit Interface / Signaling Line Circuit Interface / Fire Alarm Control Interface

6.6 Supervising Station Monitoring

Description	Yes	No	Time	Comments
Alarm signal	❑	❑		
Alarm restoration	❑	❑		
Trouble signal	❑	❑		
Trouble restoration	❑	❑		
Supervisory signal	❑	❑		
Supervisory restoration	❑	❑		

6.7 Public Emergency Alarm Reporting System

Description	Yes	No	Time	Comments
Alarm signal	❑	❑		
Alarm restoration	❑	❑		
Trouble signal	❑	❑		
Trouble restoration	❑	❑		
Supervisory signal	❑	❑		
Supervisory restoration	❑	❑		

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Δ **FIGURE 7.8.2(g)** ***Continued***

SYSTEM RECORD OF INSPECTION AND TESTING *(continued)*

7. NOTIFICATIONS THAT TESTING IS COMPLETE

Monitoring organization	Contact: _____	Time: _____
Building management	Contact: _____	Time: _____
Building occupants	Contact: _____	Time: _____
Authority having jurisdiction	Contact: _____	Time: _____
Other, if required	Contact: _____	Time: _____

8. SYSTEM RESTORED TO NORMAL OPERATION

Date: _____ Time: _____

9. CERTIFICATION

This system as specified herein has been inspected and tested according to NFPA 72, _____edition, Chapter 14.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

Qualifications (refer to 10.6.3): _____

10. DEFECTS OR MALFUNCTIONS NOT CORRECTED AT CONCLUSION OF SYSTEM INSPECTION, TESTING, OR MAINTENANCE

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

10.1 Acceptance by Owner or Owner's Representative:

The undersigned accepted the test report for the system as specified herein:

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

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Δ **FIGURE 7.8.2(g)** ***Continued***

NOTIFICATION APPLIANCE SUPPLEMENTARY RECORD OF INSPECTION AND TESTING

This form is a supplement to the System Record of Inspection and Testing.
It includes a notification appliance test record.
This form is to be completed by the system inspection and testing contractor at the time of the inspection and/or test.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Inspection/Test Start Date/Time: _____ Inspection/Test Completion Date/Time: _____

Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. NOTIFICATION APPLIANCE TEST RESULTS

Appliance Type	Location/Identifier	Test Results

Δ **FIGURE 7.8.2(h) Notification Appliance Supplementary Record of Inspection and Testing.**

NOTIFICATION APPLIANCE SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

2. NOTIFICATION APPLIANCE TEST RESULTS *(continued)*

Appliance Type	Location/Identifier	Test Results

See main System Record of Inspection and Testing for additional information, certifications, and approvals.

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Δ **FIGURE 7.8.2(h)** *Continued*

INITIATING DEVICE
SUPPLEMENTARY RECORD OF INSPECTION AND TESTING

This form is a supplement to the System Record of Inspection and Testing.
It includes an initiating device test record.
This form is to be completed by the system inspection and testing contractor at the time of the inspection and/or test.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Inspection/Test Start Date/Time: _____ Inspection/Test Completion Date/Time: _____

Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. INITIATING DEVICE TEST RESULTS

Device Type	Address	Location	Test Results

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Δ **FIGURE 7.8.2(i) Initiating Device Supplementary Record of Inspection and Testing.**

INITIATING DEVICE
SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

2. INITIATING DEVICE TEST RESULTS ***(continued)***

Device Type	Address	Location	Test Results

See main System Record of Inspection and Testing for additional information, certifications, and approvals.

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Δ **FIGURE 7.8.2(i)** ***Continued***

MASS NOTIFICATION SYSTEM
SUPPLEMENTARY RECORD OF INSPECTION AND TESTING

This form is a supplement to the System Record of Inspection and Testing.
It includes a mass notification system test record.
This form is to be completed by the system inspection and testing contractor at the time of the inspection and/or test.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Inspection/Test Start Date/Time: _____ Inspection/Test Completion Date/Time: _____

Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. MASS NOTIFICATION SYSTEM

2.1 System Type

❑ In-building MNS—combination

❑ In-building MNS—stand alone ❑ Wide-area MNS ❑ Distributed recipient MNS

❑ Other (specify): _____

2.2 System Features

❑ Combination fire alarm/MNS ❑ MNS ACU only ❑ Wide-area MNS to regional national alerting interface

❑ Local operating console (LOC) ❑ Direct recipient MNS (DRMNS) ❑ Wide-area MNS to DRMNS interface

❑ Wide-area MNS to high-power loudspeaker array (HPLA) interface ❑ In-building MNS to wide-area MNS interface

❑ Other (specify): _____

3. IN-BUILDING MASS NOTIFICATION SYSTEM

3.1 Primary Power

Input voltage of MNS panel: _____ MNS panel amps: _____

3.2 Engine-Driven Generator ❑ This system does not have a generator.

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

3.3 Stored-Energy Emergency Power Supply Systems ❑ This system does not have an SEPSS.

Equipment powered by an SEPSS: _____

Location of SEPSS: _____

Calculated capacity of SEPSS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

3.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

❑ Batteries are marked with date of manufacture.

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Δ FIGURE 7.8.2(j) Mass Notification System Supplementary Record of Inspection and Testing.

MASS NOTIFICATION SYSTEM
SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

4. MASS NOTIFICATION EQUIPMENT TEST RESULTS

Description	Visual Inspection	Functional Test	Comments
Functional test			
Reset/power down test			
Fuses			
Primary power supply			
SEPSS power test			
Trouble signals			
Disconnect switches			
Ground-fault monitoring			
CCU security mechanism			
Prerecorded message content			
Prerecorded message activation			
Software backup performed			
Test backup software			
Fire alarm to MNS interface			
MNS to fire alarm interface			
In-building MNS to wide-area MNS			
MNS to direct recipient MNS			
Sound pressure levels Occupied ❑ Yes ❑ No Ambient dBA:_____ Alarm dBA:_____ (attach supplementary notification appliance form(s) with locations, values, and weather conditions)			
System intelligibility Test method:_____ Score:_____ CIS value: _____ (attach supplementary notification appliance form(s) with locations, values, and weather conditions)			
Other (specify):			

See main System Record of Inspection and Testing for additional information, certifications, and approvals.

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Δ **FIGURE 7.8.2(j)** *Continued*

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF INSPECTION AND TESTING

This form is a supplement to the System Record of Inspection and Testing.
It includes systems and components specific to emergency communication systems.
This form is to be completed by the system inspection and testing contractor at the time of the inspection and/or test.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Inspection/Test Start Date/Time: _____ Inspection/Test Completion Date/Time: _____

Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. DESCRIPTION OF SYSTEM OR SERVICE

❑ Fire alarm with in-building fire emergency voice alarm communications system (EVAC)

❑ Mass notification system

❑ Combination system, with the following components:

❑ Fire alarm ❑ EVACS ❑ MNS ❑ Two-way, in-building, emergency communications system

❑ Other (specify): _____

Additional description of system(s): _____

_____

2.1 In-Building Fire Emergency Voice Alarm Communications System

Manufacturer: _____ Model number: _____

Number of single voice alarm channels: _____ Number of multiple voice alarm channels: _____

Number of loudspeakers: _____ Number of loudspeaker circuits: _____

Location of amplification and sound processing equipment: _____

_____

_____

Location of paging microphone stations:

Location 1: _____

Location 2: _____

Location 3: _____

2.2 Mass Notification System

2.2.1 System Type:

❑ In-building MNS—combination

❑ In-building MNS ❑ Wide-area MNS ❑ Distributed recipient MNS

❑ Other (specify): _____

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Δ **FIGURE 7.8.2(k) Emergency Communications Systems Supplementary Record of Inspection and Testing.**

EMERGENCY COMMUNICATIONS SYSTEMS
SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

2. DESCRIPTION OF SYSTEM OR SERVICE *(continued)*

2.2.2 System Features:

❑ Combination fire alarm/MNS ❑ MNS autonomous control unit ❑ Wide-area MNS to regional national alerting interface

❑ Local operating console (LOC) ❑ Distributed-recipient MNS (DRMNS) ❑ Wide-area MNS to DRMNS interface

❑ Wide-area MNS to high-power loudspeaker array (HPLA) interface ❑ In-building MNS to wide-area MNS interface

❑ Other (specify): _____

2.2.3 MNS Local Operating Consoles

Location 1: _____

Location 2: _____

Location 3: _____

2.2.4 High-Power Loudspeaker Arrays

Number of HPLA loudspeaker initiation zones: _____

Location 1: _____

Location 2: _____

Location 3: _____

2.2.5 Mass Notification Devices

Combination fire alarm/MNS visual devices: _____ MNS-only visual devices: _____

Textual signs: _____ Other (describe): _____

Supervision class: _____

2.2.6 Special Hazard Notification

❑ This system does not have special suppression pre-discharge notification

❑ MNS systems DO NOT override notification appliances required to provide special suppression pre-discharge notification

3. TWO-WAY EMERGENCY COMMUNICATION SYSTEMS

3.1 Telephone System

Number of telephone jacks installed: _____ Number of warden stations installed: _____

Number of telephone handsets stored on site: _____

Type of telephone system installed: ❑ Electrically powered ❑ Sound powered

3.2 Area of Refuge Emergency Communications Systems

Number of stations: _____ Location of central control point: _____

Days and hours when central control point is attended: _____

Location of alternate control point: _____

Days and hours when alternate control point is attended: _____

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Δ **FIGURE 7.8.2(k)** ***Continued***

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

3. TWO-WAY EMERGENCY COMMUNICATIONS SYSTEMS *(continued)*

3.3 Elevator Emergency Communications Systems

Number of elevators with stations: _____ Location of central control point: _____

Days and hours when central control point is attended: _____

Location of alternate control point: _____

Days and hours when alternate control point is attended: _____

3.4 Other Two-Way Communications System

Describe: _____

4. TESTING RESULTS

4.1 Control Unit and Related Equipment

Description	Visual Inspection	Functional Test	Comments
Control unit	❑	❑	
Lamps/LEDs/LCDs	❑	❑	
Fuses	❑	❑	
Trouble signals	❑	❑	
Disconnect switches	❑	❑	
Ground fault monitoring	❑	❑	
Supervision	❑	❑	
Local annunciator	❑	❑	
Remote annunciators	❑	❑	
Remote power panels	❑	❑	
Other:	❑	❑	

4.2 Secondary Power

Description	Visual Inspection	Functional Test	Comments
Battery condition	❑	❑	
Load voltage	❑	❑	
Discharge test	❑	❑	
Charger test	❑	❑	
Remote panel batteries	❑	❑	

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Δ **FIGURE 7.8.2(k)** *Continued*

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

4. TESTING RESULTS *(continued)*

4.3 Emergency Communications Equipment

Description	Visual Inspection	Functional Test	Comments
Control unit	❑	❑	
Lamps/LEDs/LCDs	❑	❑	
Fuses	❑	❑	
Secondary power supply	❑	❑	
Trouble signals	❑	❑	
Disconnect switches	❑	❑	
Ground fault monitoring	❑	❑	
Panel supervision	❑	❑	
System performance	❑	❑	
System audibility	❑	❑	
System intelligibility	❑	❑	
Other:	❑	❑	

4.4 Mass Notification Equipment

Description	Visual Inspection	Functional Test	Comments
Functional test	❑	❑	
Reset/Power down test	❑	❑	
Fuses	❑	❑	
Primary power supply	❑	❑	
SEPSS power test	❑	❑	
Trouble signals	❑	❑	
Disconnect switches	❑	❑	
Ground fault monitoring	❑	❑	
CCU security mechanism	❑	❑	
Prerecorded message content	❑	❑	
Prerecorded message activation	❑	❑	
Software backup performed	❑	❑	
Test backup software	❑	❑	
Fire alarm to MNS Interface	❑	❑	
MNS to fire alarm interface	❑	❑	
In-building MNS to wide-area MNS	❑	❑	
MNS to direct recipient MNS	❑	❑	

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Δ **FIGURE 7.8.2(k)** ***Continued***

EMERGENCY COMMUNICATIONS SYSTEMS
SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

4. TESTING RESULTS *(continued)*

4.4 Mass Notification Equipment *(continued)*

Description	Visual Inspection	Functional Test	Comments
Sound pressure levels (attach report with locations, values, and weather conditions)	❑	❑	
System intelligibility ❑ CSI ❑ STI (attach report with locations, values, and weather conditions)	❑	❑	
Other:	❑	❑	

4.5 Two-Way Communication Equipment

Description	Visual Inspection	Functional Test	Comments
Phone handsets	❑	❑	
Phone jacks	❑	❑	
Off-hook indicator	❑	❑	
Call-in signal	❑	❑	
System performance	❑	❑	
System audibility	❑	❑	
System intelligibility	❑	❑	
Other:	❑	❑	

See main System Record of Inspection and Testing for additional information, certifications, and approvals.

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Δ **FIGURE 7.8.2(k)** *Continued*

INTERFACE COMPONENT
SUPPLEMENTARY RECORD OF INSPECTION AND TESTING

This form is a supplement to the System Record of Inspection and Testing.
It includes an interface component test record for circuit interfaces, signaling line circuit interfaces, and fire alarm control interfaces.
This form is to be completed by the system inspection and testing contractor at the time of the inspection and/or test.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Inspection/Test Start Date/Time: _____ Inspection/Test Completion Date/Time: _____

Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. INTERFACE COMPONENT TEST RESULTS

Interface Component Type	Address	Location	Test Results

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Δ **FIGURE 7.8.2(l) Interface Component Supplementary Record of Inspection and Testing.**

INTERFACE COMPONENT SUPPLEMENTARY RECORD OF INSPECTION AND TESTING *(continued)*

2. INTERFACE COMPONENT TEST RESULTS *(continued)*

Interface Component Type	Address	Location	Test Results

See main System Record of Inspection and Testing for additional information, certifications, and approvals.

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Δ **FIGURE 7.8.2(l)** *Continued*

INSTALLATION AND INSPECTION FORM
SINGLE- AND MULTIPLE-STATION ALARMS AND HOUSEHOLD FIRE ALARM SYSTEMS

This form is to be completed at the time of installation/final inspection of any household fire alarm system and single- or multiple-station alarms. It shall be permitted to modify this form as required to provide a more complete and/or clear record.
Insert N/A in all unused lines.
Attach additional sheets, data, or calculations as necessary to complete form.

Form Completion Date: _____ Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Property Owner: _____
Address: _____
Phone: _____ E-Mail: _____ Other: _____

2. INSTALLATION, CONTRACTOR, AND MONITORING INFORMATION

Installation Contractor: _____
Address: _____
Phone: _____ E-Mail: _____ Other: _____

2.1 Type of Off-Premises Notification

Monitoring Organization: _____
Address: _____
Phone: _____ E-Mail: _____ Other: _____
Account Number: _____ Means of Transmission: _____

3. DESCRIPTION OF SYSTEM OR SERVICE

NFPA 72 Edition: _____

3.1 Type of System

❑ Single-Station ❑ Multiple-Station ❑ Household Fire Alarm System ❑ Carbon Monoxide Alarm System

3.2 Number of Devices

Single-Station Smoke Alarms: _____ Multiple-Station Smoke Alarms: _____
Single-Station Heat Alarms: _____ Multiple-Station Heat Alarms: _____
Single-Station Carbon Monoxide Alarms: _____ Multiple-Station Carbon Monoxide Alarms: _____
System Smoke Detectors: _____ System Heat Detectors: _____
Waterflow Switches: _____
Notification Appliances: _____ Type: _____
Interfaced/Other Equipment: _____

3.3 Location (L) and Date (D) of Devices

Device type, location and manufacture date of devices (date shown on back of devices)

_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____

Electrical Panel (L): _____ Breaker Number: _____
Alarm Control Unit (L): _____ Battery Back-up (D): _____
Plug in Transformer (L): _____
Relay for Interconnection (L): _____

4. PREPARED BY

Signed: _____ Printed Name: _____ Date: _____
Title: _____ Organization: _____

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Δ FIGURE 7.8.2(m) Installation and Inspection Form Single- and Multiple-Station Alarms and Household Fire Alarm Systems.

Chapter 8 Reserved

Chapter 9 Reserved

Chapter 10 Fundamentals

10.1 Application.

10.1.1 The basic functions of a complete fire alarm and/or signaling system shall comply with the requirements of this chapter.

10.1.2 The requirements of this chapter shall apply to systems, equipment, and components addressed in Chapters 11, 12, 14, 17, 18, 21, 23, 24, 26, and 27.

10.1.3 The requirements of Chapter 7 shall apply where referenced in Chapter 10.

10.2 Purpose. The purpose of fire alarm and signaling systems shall be primarily to provide notification of alarm, supervisory, and trouble conditions; to alert the occupants; to summon aid; and to control emergency control functions.

10.3 Equipment.

10.3.1* Equipment constructed and installed in conformity with this Code shall be listed for the purpose for which it is used.

10.3.2 System components shall be installed, tested, inspected, and maintained in accordance with the manufacturer's published instructions and this Code.

10.3.3* All devices and appliances that receive their operating power from an initiating device circuit (IDC) or from a signaling line circuit (SLC) of a control unit shall be listed for use with the control unit.

10.3.4 All apparatus requiring rewinding or resetting to maintain normal operation shall be restored to normal after each abnormal condition.

10.3.5 Equipment shall be designed so that it is capable of performing its intended functions under the following conditions:

(1)* At 85 percent and at 110 percent of the nameplate primary (main) and secondary (standby) input voltage(s)
(2) At ambient temperatures of 32°F (0°C) and 120°F (49°C)
(3) At a relative humidity of 85 percent and an ambient temperature of 86°F (30°C)

10.4 Design and Installation.

10.4.1* All systems shall be installed in accordance with the plans, specifications, and standards approved by the authority having jurisdiction.

10.4.2 Devices and appliances shall be located and mounted so that accidental operation or failure is not caused by vibration or jarring.

10.4.3 Equipment shall be installed in locations where conditions do not exceed the voltage, temperature, and humidity limits specified in the manufacturer's published instructions.

10.4.4* Control unit displays, visible indicators, or controls shall be mounted to comply with both of the following unless otherwise permitted by the authority having jurisdiction:

(1) The distance to the highest switch, lamp, or top of any textual display does not exceed 6 ft (1.8 m) above the finished floor.
(2) The distance to the lowest switch, lamp, or bottom of any textual display is not within 15 in. (375 mm) of the finished floor.

10.4.5* Unless otherwise permitted by 10.4.5.1 or 10.4.5.2, in areas that are not continuously occupied, early warning fire detection shall be at the location of each control unit(s), notification appliance circuit power extender(s), and supervising station transmitting equipment to provide notification of fire at that location by one of the following means:

(1) An automatic smoke detector at the location of each control unit(s), notification appliance circuit power extender(s), and supervising station transmitting equipment
(2) An automatic heat detector where ambient conditions prohibit installation of an automatic smoke detector

10.4.5.1* Smoke or heat detector(s) shall not be required to be installed at the location of dedicated function(s) fire alarm control unit(s) that are not required to provide local or supervising station notification signals.

10.4.5.2 Where a risk analysis shows that early warning fire detection is not required and where acceptable to the authority having jurisdiction, the requirements of 10.4.5 shall not apply.

10.4.6 Initiating Devices.

10.4.6.1 Initiating devices of the manual or automatic type shall be selected and installed to minimize unwanted alarms.

10.4.6.2 Initiating devices shall comply with the requirements of Chapter 17 and Chapter 23.

10.4.6.3 Manual alarms shall be initiated by one of the following ways:

(1) A listed manual fire alarm box
(2) A key operated means
(3) A means contained within a locked cabinet or arranged to provide equivalent protection against unauthorized use

10.4.7 Abandoned Fire Alarm Equipment.

10.4.7.1 Abandoned fire alarm equipment shall be removed.

10.4.7.2 Abandoned fire alarm equipment shall be marked "not in service" until removed.

10.5 Personnel Qualifications.

10.5.1 System Designer.

10.5.1.1 Plans and specifications shall be developed in accordance with this Code by persons who are experienced in the design, application, installation, and testing of the systems.

10.5.1.2 State or local licensure regulations shall be followed to determine qualified personnel.

10.5.1.3 Personnel shall provide documentation of their qualification by one or more of the following:

(1) Registration, licensing, or certification by a state or local authority
(2) Certification by an organization acceptable to the authority having jurisdiction
(3) Certification by the manufacturer(s) of the specific equipment used in the system

10.5.1.4 The system designer shall be identified on the system design documents.

10.5.1.5 System design trainees shall be under the supervision of a qualified system designer.

10.5.1.6 The system designer shall provide evidence of their qualifications and/or certifications when required by the authority having jurisdiction.

10.5.2 System Installer.

10.5.2.1 Installation personnel shall be at least one of the following:

(1) Qualified in the installation, inspection, and testing of the systems
(2) Supervised by persons who are qualified in the installation, inspection, and testing of the systems

10.5.2.2 State or local licensure regulations shall be followed to determine qualified personnel.

10.5.2.3 Personnel shall provide documentation of their qualification by one or more of the following:

(1) Registration, licensing, or certification by a state or local authority
(2) Certification by an organization acceptable to the authority having jurisdiction
(3) Certification by the manufacturer(s) of the specific equipment used in the system

10.5.2.4 System installation trainees shall be under the supervision of a qualified system installer.

10.5.2.5 The system installer shall provide evidence of their qualifications and/or certifications when requested by the authority having jurisdiction.

10.5.3* Inspection, Testing, and Service Personnel. (SIG-TMS)

10.5.3.1* Inspection Personnel. Inspections shall be performed by personnel who have developed competence through training and experience that are acceptable to the authority having jurisdiction or meet the requirement of 10.5.3.4.

Δ **10.5.3.2* Testing Personnel.**

N **10.5.3.2.1** Testing personnel shall be knowledgeable of and experienced in the following:

(1) Testing requirements contained in this Code
(2) Equipment being tested
(3) Test methods to be used

N **10.5.3.2.2** Knowledge and experience shall be acceptable to the authority having jurisdiction or meet the requirement of 10.5.3.4.

Δ **10.5.3.3 Service Personnel.**

N **10.5.3.3.1** Service personnel shall be knowledgeable of and experienced in the following:

(1) Maintenance and servicing requirements contained in this Code
(2) Equipment being serviced or maintained
(3) Servicing or maintenance methods to be used

N **10.5.3.3.2** Knowledge and experience shall be acceptable to the authority having jurisdiction or meet the requirement of 10.5.3.4.

10.5.3.4 Means of Qualification. Qualified personnel shall include, but not be limited to, one or more of the following:

(1)* Personnel who are factory trained and certified for the specific type and brand of system being serviced
(2)* Personnel who are certified by a nationally recognized certification organization acceptable to the authority having jurisdiction
(3)* Personnel who are registered, licensed, or certified by a state or local authority to perform service on systems addressed within the scope of this Code, either individually or through their affiliation with an organization
(4) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the servicing of systems within the scope of this Code

10.5.3.5* Programming Personnel.

10.5.3.5.1 Personnel programming a system shall be certified by the system manufacturer.

10.5.3.5.2 System installation personnel shall be permitted to configure systems in the field per manufacturers' published instructions.

10.5.3.5.3 System end users shall be permitted to manage system operation per manufacturers' published instructions or training.

10.5.3.6 Evidence of Qualification. Evidence of qualifications shall be provided to the authority having jurisdiction upon request.

10.5.4 Plans Examiners and Inspectors.

10.5.4.1 Plans and specifications submitted for review and approval shall be reviewed by personnel who are qualified to review such plans and specifications.

10.5.4.2 System installations shall be inspected by personnel who are qualified to perform such inspections.

10.5.4.3 State or local licensure regulations shall be followed to determine qualified personnel.

10.5.4.4 Personnel shall provide documentation of their qualifications by one or more of the following:

(1) Registration, licensing, or certification by a state or local authority
(2) Meeting the requirements of NFPA 1031
(3) Assignment by the authority having jurisdiction to personnel having equivalent competency with 10.5.4.4(1) or 10.5.4.4(2)

10.5.5 Supervising Station Operators. (SIG-SSS)

10.5.5.1 All operators in the supervising station shall demonstrate competence in all tasks required of them in Chapter 26 by one or more of the following:

(1) Certified by the manufacturer of the receiving system or equipment or the alarm-monitoring automation system
(2)* Certified by an organization acceptable to the authority having jurisdiction
(3) Licensed or certified by a state or local authority
(4) Other training or certification approved by the authority having jurisdiction

Δ **10.5.5.2 Evidence of Qualifications and/or Certification.**

N **10.5.5.2.1** Evidence of qualifications and/or certification shall be provided when requested by the authority having jurisdiction.

N **10.5.5.2.2** A license or qualification listing shall be current in accordance with the requirements of the issuing authority or organization.

10.5.5.3 Operator trainees shall be under the direct supervision of a qualified operator until qualified as required by 10.5.5.1.

10.5.6 Public Emergency Alarm Reporting System Personnel Qualification. (SIG-PRS)

10.5.6.1 System Designer.

10.5.6.1.1 Public emergency alarm reporting system plans and specifications shall be developed in accordance with this Code by persons who are qualified in the proper design, application, installation, and testing of public emergency alarm reporting systems.

10.5.6.1.2 The system design documents shall include the name and contact information of the system designer.

10.5.6.2 System Installer. Installation personnel shall be qualified in the installation, inspection, and testing of public emergency alarm reporting systems.

10.5.6.3 Service Personnel. Service personnel shall be qualified in the service, inspection, maintenance, and testing of public emergency alarm reporting systems.

10.5.6.4 Qualification.

10.5.6.4.1 Personnel shall demonstrate qualification by being trained and certified in public emergency alarm reporting system design, installation, or service (as appropriate).

10.5.6.4.2 Personnel who are trained and certified for the specific type of public emergency alarm reporting system and comply with one the following shall be considered qualified:

(1) Personnel who are licensed or certified by a state or local authority, if applicable
(2)* Personnel who are certified by a nationally recognized certification organization acceptable to the authority having jurisdiction
(3) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the design, installation, or servicing of systems within the scope of this chapter
(4)* Personnel who are employed and certified by an equipment manufacturer for the specific type of system

Δ **10.5.6.4.3 Evidence of Qualifications.**

N **10.5.6.4.3.1** Evidence of qualifications and/or certification shall be provided when requested by the authority having jurisdiction.

N **10.5.6.4.3.2** A license or qualification listing shall be current in accordance with the requirements of the issuing authority or organization.

N **10.5.7 Gateway Reporting System Personnel Qualification. (SIG-SSS)**

N **10.5.7.1 Gateway Personnel.** Gateway personnel shall be qualified in the service, inspection, maintenance, and testing of gateway alarm reporting systems.

N **10.5.7.2 Qualification.**

N **10.5.7.2.1** Personnel shall demonstrate qualification by being trained and certified in gateway alarm reporting system design, installation, or service (as appropriate).

N **10.5.7.2.2** Personnel who are trained and certified for the specific type of subsidiary station or auxiliary service provider system and comply with one the following shall be considered qualified:

(1) Personnel who are licensed or certified by a state or local authority, if applicable
(2) Personnel who are certified by a nationally recognized certification organization acceptable to the authority having jurisdiction
(3) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the design, installation, or servicing of systems within the scope of this chapter
(4) Personnel who are employed and certified by an equipment manufacturer for the specific type of system

N **10.5.7.2.3** A license or qualification listing shall be current in accordance with the requirements of the issuing authority or organization.

N **10.5.7.2.4** Evidence of qualifications and/or certification shall be provided when requested by the authority having jurisdiction.

10.6 Power Supplies.

10.6.1* Scope. The provisions of this section shall apply to power supplies.

10.6.2 Code Conformance. All power supplies shall be installed in accordance with applicable requirements of *NFPA 70*.

10.6.3 Power Supply Sources.

Δ **10.6.3.1*** Power shall be supplied in accordance with 10.6.3.2, 10.6.4, or 23.16.2.

10.6.3.2 Unless configured in compliance with 10.6.4 or 23.16.2, at least two independent and reliable power supplies shall be provided, one primary and one secondary.

10.6.3.3 Each power supply shall be of adequate capacity for the application.

10.6.3.4 Monitoring the integrity of power supplies shall be in accordance with 10.6.9.

10.6.4* Stored-Energy Emergency Power Supply Systems (SEPSS).

10.6.4.1 An SEPSS that is not arranged in accordance with 10.6.4.2 shall comply with all of the following:

(1) An SEPSS shall be configured in compliance with NFPA 111 for a Type O or U, Level 1 system.
(2) The SEPSS shall be capable of powering the maximum required system load.
(3) The SEPSS shall have capacity in accordance with 10.6.7.2.

10.6.4.2 Where connected to an engine-driven generator arranged in accordance with 10.6.11.3.1, an SEPSS that complies with all of the following shall be permitted:

(1) An SEPSS shall be configured in compliance with NFPA 111 for a Type O or U, Class 4, Level 1 system.
(2) The SEPSS shall be capable of powering the maximum required system load.

10.6.4.3 An SEPSS shall comply with the requirements of 10.6.5.

10.6.4.4* SEPSS equipment shall be installed in the manner and location recommended by the manufacturer and in accordance with NFPA 855 for SEPSS equipment whose rated energy capacity is within the scope of NFPA 855.

10.6.4.5 Failure of an SEPSS shall result in the initiation of a trouble signal in accordance with Section 10.15.

10.6.5 Primary Power Supply.

10.6.5.1 Branch Circuit.

10.6.5.1.1 The branch circuit supplying the equipment shall be supplied by one of the following:

(1) Electric utility
(2) An engine-driven generator or equivalent in accordance with 10.6.11.2, where a person trained in its operation is on duty at all times
(3) An engine-driven generator or equivalent arranged for cogeneration with an electric utility in accordance with 10.6.11.2, where a person trained in its operation is on duty at all times

10.6.5.1.2* The branch circuit supplying the equipment shall supply no other loads.

10.6.5.2 Circuit Identification and Accessibility.

10.6.5.2.1 The location of the branch circuit disconnecting means shall be permanently identified at the control unit.

10.6.5.2.2* The system circuit disconnecting means shall be marked to identify the system or equipment that it serves.

10.6.5.2.3 For fire alarm and/or signaling systems, the circuit disconnecting means shall have a red marking.

10.6.5.2.4 The red marking shall not damage the overcurrent protective devices or obscure the manufacturer's markings.

10.6.5.2.5 The circuit disconnecting means shall be accessible only to authorized personnel.

10.6.5.3 Mechanical Protection. The branch circuit(s) and connections shall be protected against physical damage.

10.6.5.4 Circuit Breaker Lock. Where a circuit breaker is the disconnecting means, an approved breaker locking device shall be installed.

10.6.5.5 Overcurrent Protection. An overcurrent protective device shall be provided in accordance with *NFPA 70*.

10.6.6* Continuity of Power Supplies.

10.6.6.1 The secondary power supply shall automatically provide power to the protected premises system within 10 seconds whenever the primary power supply voltage is insufficient for required system operation.

10.6.6.2 The secondary power supply shall automatically provide power to the supervising station facility and equipment within 60 seconds whenever the primary power supply voltage is insufficient for required system operation.

10.6.6.3 Required signals shall not be lost, interrupted, or delayed by more than 10 seconds as a result of the primary power failure.

10.6.6.3.1 Storage batteries dedicated to the system or ESS arranged in accordance with the provisions of NFPA 111 shall be permitted to supplement the secondary power supply to ensure required operation during the transfer period.

10.6.6.3.2 Where an ESS is employed in 10.6.6.3.1, a positive means for disconnecting the input and output of the ESS system while maintaining continuity of power supply to the load shall be provided.

10.6.7 Secondary Power Supply.

10.6.7.1 Secondary Power Operation.

10.6.7.1.1 Operation on secondary power shall not affect the required performance of a system or supervising station facility, including alarm, supervisory, and trouble signals and indications.

Exception: While operating on secondary power, audio amplifier monitoring shall be required only when an alarm is present.

10.6.7.2* Capacity.

10.6.7.2.1 The secondary power supply for the protected premises system shall have sufficient capacity to operate the system under quiescent load (system operating in a nonalarm condition) for a minimum of 24 hours.

10.6.7.2.2 At the end of the period in 10.6.7.2.1, the secondary power supply shall be capable of operating all alarm notification appliances used for evacuation or to direct aid to the location of an emergency for 5 minutes, unless otherwise permitted or required by 10.6.7.2.4.

10.6.7.2.3 The secondary power supply for in-building fire emergency voice/alarm communications service shall be capable of operating the system under quiescent load for a minimum of 24 hours.

10.6.7.2.4 At the end of the period in 10.6.7.2.3, the secondary power supply shall be capable of operating the system during a fire or other emergency condition for a period of 15 minutes at maximum connected load.

10.6.7.2.5 The secondary power supply capacity for supervising station facilities and equipment shall be capable of supporting operations for a minimum of 24 hours.

10.6.7.2.6 The secondary power supply for high-power loudspeaker arrays used for wide-area mass notification systems shall be in accordance with 24.6.5.2.

10.6.7.2.7 The secondary power supply for textual visual notification appliances shall be in accordance with 24.6.10.1.

10.6.7.2.8 The secondary power supply capacity for emergency command centers of wide-area mass notification systems shall be capable of supporting operations for a minimum of 24 hours.

10.6.7.2.9 The secondary power supply for in-building mass notification systems shall be capable of operating the system under quiescent load for a minimum of 24 hours.

10.6.7.2.10 The secondary power supply for in-building mass notification systems shall be capable of operating the system during emergency conditions for a period of 15 minutes at maximum connected load.

10.6.7.2.11 The secondary power supply for communications equipment at the protected premises that is used to transmit signals to a supervising station shall have sufficient capacity to operate the system under quiescent load (system operating in a nonalarm condition) for a minimum of 24 hours.

10.6.7.2.12 At the end of the period in 10.6.7.2.11, the secondary power supply for communications equipment shall be capable of transmitting signals for a period of 5 minutes.

10.6.7.2.13 The secondary power supply capacity required shall include all power supply loads that are not automatically disconnected upon the transfer to secondary power supply.

10.6.7.2.14* As a minimum, battery calculations shall apply a correction factor of 1.25 for aging to ensure the battery can meet its current demand at the end of service life.

10.6.7.2.15* Where carbon monoxide detection is not monitored by a supervising station, the secondary power supply shall have sufficient capacity to operate the carbon monoxide detection system under quiescent load (system operating in a nonalarm condition) for a minimum of 24 hours.

10.6.7.2.16 At the end of the period in 10.6.7.2.15, the secondary power supply shall be capable of operating the carbon monoxide detection system and all carbon monoxide notification appliances for 12 hours.

10.6.7.2.17 Where carbon monoxide detection is monitored by a supervising station, both of the following shall apply:

(1) The secondary power supply shall have sufficient capacity to operate the carbon monoxide detection system under quiescent load (system operating in a nonalarm condition) for a minimum of 24 hours.
(2) At the end of the 24-hour period, the secondary power supply shall be capable of operating the carbon monoxide detection system and all notification appliances for 5 minutes.

10.6.7.3* Secondary Power Supply for Protected Premises Fire Alarm Systems and Emergency Communications Systems.

10.6.7.3.1 The secondary power supply shall consist of one of the following:

(1) A storage battery dedicated to the system arranged in accordance with 10.6.10
(2) An automatic-starting, engine-driven generator serving the branch circuit specified in 10.6.5.1 and arranged in accordance with 10.6.11.3.1, and storage batteries dedicated to the system with 4 hours of capacity arranged in accordance with 10.6.10

10.6.7.3.2 Secondary circuits that provide power to the control unit and are not integral to the unit shall be protected against physical damage.

10.6.7.4 Secondary Power Supply for Supervising Station Facilities.

10.6.7.4.1 The secondary power supply shall consist of one of the following:

(1) Storage batteries dedicated to the supervising station equipment arranged in accordance with 10.6.10
(2) A branch circuit of an automatic-starting, engine-driven generator arranged in accordance with 10.6.11.3.2.1 and 10.6.11.3.2.2, and storage batteries dedicated to the supervising station equipment with 4 hours of capacity arranged in accordance with 10.6.10
(3) A branch circuit of multiple engine-driven generators, at least one of which is arranged for automatic starting in accordance with 10.6.11.3.2.1 and 10.6.11.3.2.2

Δ **10.6.7.4.2** Where a secondary power supply for supervising station facilities in accordance with 10.6.7.4.1(3) is used, the following shall apply:

(1) Each generator shall be capable of supplying the energy required.
(2) Generators that are started manually shall be arranged in accordance with 10.6.11.3.2.3 and 10.6.11.3.2.4.
(3) When manual-start generators are employed, a person trained in the procedure of starting the generator shall be on duty at all times.

10.6.8 Power Supply for Remotely Located Control Equipment.

10.6.8.1* Additional power supplies required for system operation shall comply with 10.6.1 through 10.6.6 and with 10.6.9.

10.6.8.2 The location of remotely located power supplies shall be identified at the master control unit.

10.6.8.3 The master control unit display shall be permitted to satisfy the requirement of 10.6.8.2.

10.6.8.4 The location of remotely located power supplies shall be identified on the record drawings.

10.6.8.5 An uninterruptible power supply (UPS) listed to the requirements of an applicable standard such as UL 864, *Control Units and Accessories for Fire Alarm Systems*, shall be permitted to supply power to remotely located control equipment.

10.6.9 Monitoring Integrity of Power Supplies.

10.6.9.1 Unless otherwise permitted or required by 10.6.9.1.3 and 10.6.9.1.6, all primary and secondary power supplies shall be monitored for the presence of voltage at the point of connection to the system.

10.6.9.1.1 Failure of either the primary or secondary power supply shall result in a trouble signal in accordance with Section 10.15.

10.6.9.1.2 Power failure indication for a digital alarm communicator transmitter (DACT) powered from a protected premises fire alarm system control unit shall be in accordance with 10.6.9.1.

10.6.9.1.3 Monitoring shall not be required for a power supply for supplementary equipment.

10.6.9.1.4 Monitoring shall not be required for the neutral of a three-, four-, or five-wire ac or dc supply source.

10.6.9.1.5 Monitoring shall not be required for the main power supply in a supervising station if its failure is otherwise indicated and obvious to the operator on duty.

Δ **10.6.9.1.6** Monitoring shall not be required for the output of an engine-driven generator that is part of the secondary power supply, provided the generator is tested in accordance with Chapter 14.

10.6.9.2* Power supply sources and electrical supervision for digital alarm communications systems shall be in accordance with Section 10.6, 10.6.9, Section 10.19, and Section 12.6.

10.6.9.3* Supervising station alarm systems shall be arranged to delay transmission of primary power failure signals for 60 minutes to 180 minutes unless a delay is not permitted by the authority having jurisdiction.

10.6.9.4 Power supervisory devices used to monitor the integrity of power supplies shall not impair the receipt of fire alarm or supervisory signals.

10.6.10* Storage Batteries.

10.6.10.1 Marking.

10.6.10.1.1 Batteries shall be marked with the month and year of manufacture using the month/year format.

10.6.10.1.2 Where the battery is not marked with the month/year by the manufacturer, the installer shall obtain the date-code and mark the battery with the month/year of battery manufacture.

10.6.10.1.3* Rechargeable batteries used for secondary power supplies shall be listed or component recognized by a nationally recognized testing laboratory.

10.6.10.2 Arrangement.

10.6.10.2.1 Storage batteries shall comply with the requirements of Article 480 of *NFPA 70*.

10.6.10.2.2 Storage batteries shall be located so that the equipment, including overcurrent devices, is not adversely affected by battery gases.

10.6.10.2.3 Batteries shall be insulated against ground faults.

10.6.10.2.4 Batteries shall be insulated to prevent short circuits between multiple cells.

10.6.10.2.5 Batteries shall be protected from physical damage.

10.6.10.2.6 Battery racks shall be protected against corrosion.

10.6.10.2.7 If not located in or adjacent to the control unit, the batteries and their charger location shall be permanently identified at the control unit.

10.6.10.3 Battery Charging.

10.6.10.3.1 Battery charging equipment shall be provided to keep the battery fully charged under normal conditions.

10.6.10.3.2 Battery charging equipment shall be provided to recharge batteries within 48 hours after fully charged batteries have been subject to a single discharge cycle as specified in 10.6.7.2.

10.6.10.3.3 The battery charging equipment operation shall not damage the battery.

10.6.10.3.4* Batteries shall be charged by listed means.

10.6.10.3.5 Provisions for repair or replacement of failed battery charger equipment shall be maintained at supervising stations and used to restore operation prior to depletion of one-half of the battery capacity.

10.6.10.4 Overcurrent Protection. Overcurrent devices shall be provided to protect the batteries from excessive load current.

10.6.10.5 Metering. The battery charging equipment shall include integral meters or readily accessible terminals so that portable meters can be used to determine battery voltage and charging current.

10.6.10.6* Monitoring Integrity of Battery Charging Equipment.

10.6.10.6.1 Means shall be provided to detect the failure of a battery charger.

10.6.10.6.2 Failure of the battery charger shall result in a trouble signal in accordance with Section 10.15.

10.6.11 Engine-Driven Generators.

10.6.11.1 Application and Installation. The application and installation of engine-driven generators shall be as specified in 10.6.11.2 through 10.6.11.7.

10.6.11.2 Primary Power Supply.

10.6.11.2.1 Engine-driven generators arranged as the primary supply shall be designed in an approved manner.

10.6.11.2.2 Engine-driven generators arranged as the primary supply shall be installed in an approved manner.

10.6.11.3 Secondary Power Supplies.

10.6.11.3.1 Protected Premises.

10.6.11.3.1.1 Engine-driven generators used to provide secondary power for a protected premises fire alarm system or an emergency communications system shall comply with the requirements of Chapter 4 of NFPA 110 for a Type 10, Class 24, Level 1 system.

10.6.11.3.1.2 Installation of engine-driven generators used to provide secondary power for a protected premises fire alarm system or an emergency communications system shall be in accordance with Article 700 of *NFPA 70*.

10.6.11.3.1.3 Where pathway survivability is required by another section of the Code, equal protection shall be provided for power supply circuits.

10.6.11.3.2 Supervising Station.

10.6.11.3.2.1 Automatic-starting, engine-driven generators used to provide secondary power for a supervising station shall comply with the requirements of Chapter 4 of NFPA 110 for a Type 60, Class 24, Level 2 system.

10.6.11.3.2.2 Installation of automatic-starting, engine-driven generators used to provide secondary power for a supervising station shall be in accordance with Article 701 of *NFPA 70*.

10.6.11.3.2.3 Manual-starting, engine-driven generators used to provide secondary power for a supervising station shall comply with the requirements of Chapter 4 of NFPA 110 for a Type M, Class 24, Level 2 system.

10.6.11.3.2.4 Installation of manual-starting, engine-driven generators used to provide secondary power for a supervising station shall be in accordance with Article 702 of *NFPA 70*.

10.6.11.4 Performance, Operation, Testing, and Maintenance. The requirements for performance, operation, testing, and maintenance of engine-driven generators shall conform to the applicable provisions of NFPA 110.

10.6.11.5 Capacity. The unit shall be of a capacity that is sufficient to operate the system under the maximum normal load conditions in addition to all other demands placed upon the unit.

10.6.11.6 Fuel. Unless otherwise required or permitted in 10.6.11.6.1 through 10.6.11.6.3, fuel shall be available in storage sufficient for 6 months of testing plus the capacity specified in 10.6.7.

10.6.11.6.1 For public emergency alarm reporting systems, the requirements of Chapter 27 shall apply.

10.6.11.6.2 If a reliable source of supply is available at any time on a 2-hour notice, it shall be permitted to have fuel in storage sufficient for 12 hours of operation at full load.

10.6.11.6.3 Fuel systems using natural or manufactured gas supplied through reliable utility mains shall not be required to have fuel storage tanks unless the structure is a seismic design category C, D, E, or F as defined in ASCE/SEI 7, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*.

10.6.11.7 Battery and Charger.

Δ **10.6.11.7.1** A separate storage battery and separate automatic charger shall be provided for starting the engine-driven generator.

N **10.6.11.7.2** The separate storage battery automatic charger shall not be used for any other purpose.

10.6.11.7.3 The battery shall be sized in accordance with 5.6.4 of NFPA 110.

10.7 Signal Priority. The priority of signals shall be in accordance with this section.

10.7.1 ECS priority signals when evaluated by stakeholders through a risk analysis in accordance with 24.3.12 shall be permitted to take precedence over all other signals.

10.7.2 Fire alarm signals shall take precedence over all other signals, except as permitted by 10.7.1 or 10.7.3.

10.7.3* Emergency mass notification signals and messages shall be permitted to have priority over fire alarm notification signals in accordance with the requirements of Chapter 24.

10.7.4 Emergency mass notification signals and messages shall have priority over supervisory and trouble signals in accordance with the requirements of Chapter 24.

10.7.5 Carbon monoxide signals shall be permitted to take precedence over supervisory and trouble signals.

10.7.6 Pre-alarm signals shall take precedence over supervisory and trouble signals.

10.7.7 Supervisory signals shall take precedence over trouble signals.

10.7.8 Hold-up alarms or other life-threatening signals shall be permitted to take precedence over supervisory and trouble signals where acceptable to the authority having jurisdiction.

10.7.9* Where separate systems are installed, they shall be permitted to achieve the priority of signals in accordance with Section 10.7.

10.7.10 Combination systems shall comply with 23.8.4.7.

10.8 Detection and Signaling of Conditions.

10.8.1 Abnormal Condition Detection. Where required by this Code, the system shall be provided with means to detect and signal abnormal conditions.

10.8.2 Alarm Condition Detection. Where required by this Code, the system shall be provided with means to detect and signal alarm conditions.

10.8.2.1 Pre-Alarm Condition Detection. Where required by this Code, the system shall be provided with means to detect and signal pre-alarm conditions.

10.8.2.2 Supervisory Condition Detection. Where required by this Code, the system shall be provided with means to detect and signal supervisory conditions.

10.8.2.3 Trouble Condition Detection. Where required by this Code, the system shall be provided with means to detect and signal trouble conditions.

10.8.2.4 Normal Condition Detection. Where required by this Code, the system shall generate a restoration signal when the device or signaling system returns to normal.

10.9 Responses.

10.9.1 Alarm. The response to an alarm signal shall be in accordance with this Code.

10.9.2 Pre-Alarm. The response to a pre-alarm signal shall be in accordance with this Code.

10.9.3 Supervisory. The response to a supervisory signal shall be in accordance with this Code.

10.9.4 Trouble. The response to trouble signal shall be in accordance with this Code.

10.10 Distinctive Signals.

10.10.1 Priority alarm signals, fire alarm signals, carbon monoxide alarm signals, supervisory signals, pre-alarm signals, and trouble signals shall be distinctively and descriptively annunciated.

10.10.2 Audible alarm notification appliances for a fire alarm system shall produce signals that are distinctive from other similar appliances used for other purposes in the same area that are not part of the fire alarm or emergency communications system.

10.10.3 Audible alarm notification appliances for a carbon monoxide alarm system shall produce signals that are distinctive from other similar appliances used for other purposes in the same area that are not part of the carbon monoxide, fire alarm, or emergency communications system.

Δ **10.10.4* Audible Characteristics.**

N **10.10.4.1** An audible notification appliance on a control unit, on multiple control units that are interconnected to form a system, or at a remote location, shall be permitted to have the same audible characteristics for all alerting functions.

N **10.10.4.2** The audible notification appliance described in 10.10.4.1 is not limited to alarm, trouble, and supervisory alerting, provided that the distinction between signals shall be by other means.

Δ **10.10.5* Supervisory Signals.**

N **10.10.5.1** Supervisory signals shall be distinctive in sound from other signals.

N **10.10.5.2** The distinctive supervisory signal shall not be used for any other purpose except as permitted in 10.10.4.

Δ **10.10.6 Trouble Signals.**

N **10.10.6.1** Trouble signals required to indicate at the protected premises shall be indicated by distinctive audible signals.

N **10.10.6.2** Trouble signals described in 10.10.6.1 shall be distinctive from alarm signals except as permitted in 10.10.4.

N **10.10.6.3** The audible trouble signals described in 10.10.6.1 shall be permitted to be used for other purposes as permitted by 10.10.4.

Δ **10.10.7 Alarm Evacuation Signals.**

N **10.10.7.1** Alarm evacuation signals shall be distinctive in sound from other signals.

N **10.10.7.2** Alarm evacuation signals shall comply with the requirements of 18.4.2.

N **10.10.7.3** Alarm evacuation signals described in 10.10.7.1 and 10.10.7.2 shall not be used for any other purpose.

Δ **10.10.8 Pre-Alarm Signals.**

N **10.10.8.1** Pre-alarm signals shall be distinctive in sound from other signals.

N **10.10.8.2** Pre-alarm signals described in 10.10.8.1 shall not be used for any other purpose except as permitted in 10.10.4.

10.10.9 Carbon monoxide alarm signals shall comply with 18.4.3.

10.11 Alarm Signals.

10.11.1* Actuation of alarm notification appliances or emergency voice communications, emergency control function interface devices, and annunciation at the protected premises shall occur within 10 seconds after the activation of an initiating device.

10.11.2* Visual notification appliances, textual visual notification appliances, and loudspeaker notification appliances located in the same area shall be activated and deactivated as a group unless otherwise required by an ECS emergency response plan. (SIG-ECS)

10.11.3 Visual alarm notification appliances shall not be activated when loudspeaker notification appliances are used as permitted by 24.3.5 for non-emergency paging. (SIG-ECS)

10.11.4* A coded alarm signal shall consist of not less than three complete rounds of the number transmitted.

10.11.5 Each round of a coded alarm signal shall consist of not less than three impulses.

10.11.6* Resetting of alarm signals shall comply with 23.8.2.2.

10.11.7 The subsequent occurrence of a fault on an initiating device circuit or a signaling line circuit used for other than the interconnection of control units shall not affect previously transmitted unacknowledged alarm signals.

10.11.8 An alarm signal that has been deactivated at the protected premises shall comply with 10.11.8.1 and 10.11.8.2.

10.11.8.1 The audible and visible alarm signal at the control unit only shall automatically reactivate every 24 hours or less until alarm signal conditions are restored to normal.

10.11.8.2 The audible and visible alarm signal shall operate until it is manually silenced or acknowledged.

10.12* Fire Alarm Notification Appliance Deactivation.

10.12.1 A means for turning off activated alarm notification appliance(s) shall be permitted.

10.12.2* When an occupant notification alarm signal deactivation means is actuated, both audible and visual notification appliances shall be simultaneously deactivated.

10.12.3 The fire alarm notification deactivation means shall be key-operated or located within a locked cabinet, or arranged to provide equivalent protection against unauthorized use.

10.12.4 The means shall comply with the requirements of 10.18.1.

10.12.5 Subsequent Activation of Initiating Devices.

10.12.5.1 Subsequent activation of nonaddressable initiating devices on other initiating device circuits shall cause the notification appliances to reactivate.

10.12.5.2 Subsequent activation of addressable alarm initiating devices of a different type in the same room or addressable alarm initiating devices in a different room on signaling line circuits shall cause the notification appliances to reactivate.

10.12.6 A fire alarm notification deactivation means that remains in the deactivated position when there is no alarm condition shall operate an audible trouble notification appliance until the means is restored to normal.

10.13 Carbon Monoxide Notification Appliance Deactivation. A carbon monoxide initiating device with an integral sounder shall be permitted to be silenced locally if the carbon monoxide alarm or supervisory status continues to be displayed at the control unit.

10.14 Supervisory Signals.

10.14.1 Self-Restoring Supervisory Signal Indication. Visible and audible indication of self-restoring supervisory signals and visible indication of their restoration to normal shall be automatically indicated within 90 seconds at the following locations:

(1) Fire alarm control unit for local fire alarm systems
(2) Building fire command center for in-building fire emergency voice/alarm communications systems
(3) Emergency command center for one or more buildings where responsible authorities receive and disseminate information
(4) Supervising station location for systems installed in compliance with Chapter 26

10.14.2 Latching Supervisory Signal Indication.

10.14.2.1 Visible and audible indication of latching supervisory signals shall be indicated within 90 seconds at the locations specified in 10.14.1.

10.14.2.2 Restoration of latching supervisory signals shall be indicated within 90 seconds at the locations specified in 10.14.1.

10.14.3 Coded Supervisory Signal.

10.14.3.1 A coded supervisory signal shall be permitted to consist of two rounds of the number transmitted to indicate a supervisory off-normal condition.

10.14.3.2 A coded supervisory signal shall be permitted to consist of one round of the number transmitted to indicate the restoration of the supervisory condition to normal.

10.14.4 Combined Coded Alarm and Supervisory Signal Circuits. Where both coded sprinkler supervisory signals and coded fire or waterflow alarm signals are transmitted over the same signaling line circuit, provision shall be made to obtain either alarm signal precedence or sufficient repetition of the alarm signal to prevent the loss of an alarm signal.

10.14.5 Supervisory Notification Appliance Location. The audible supervisory notification appliances shall be located in an area where they are to be heard.

10.14.6 Supervisory Signal Reactivation. A supervisory signal that has been deactivated at the protected premises shall comply with 10.14.6.1 and 10.14.6.2.

10.14.6.1 The audible and visible supervisory signal at the control unit only shall automatically reactivate every 24 hours or less until supervisory signal conditions are restored to normal.

10.14.6.2 The audible and visible supervisory signal shall operate until it is manually silenced or acknowledged.

10.14.7 Supervisory Notification Appliance Deactivation.

10.14.7.1 A means for deactivating supervisory notification appliances shall be permitted.

10.14.7.2 The means shall be key-operated or located within a locked cabinet, or arranged to provide equivalent protection against unauthorized use.

10.14.7.3 The means for deactivating supervisory notification appliances shall comply with the requirements of 10.18.2.

10.14.7.4 Subsequent activation of supervisory initiating devices in other building zones shall cause supervisory notification appliances to activate as required by the system input/output matrix.

10.14.7.5 A means for deactivating supervisory notification appliances that remains in the deactivated position when there is no supervisory condition shall operate an audible trouble notification appliance until the means is restored to normal.

10.15 Trouble Signals.

10.15.1 Trouble signals and their restoration to normal shall be indicated within 200 seconds at the locations identified in 10.15.7 and 10.15.8.

10.15.2 Indication of primary power failure trouble signals transmitted to a supervising station shall be in accordance with 10.6.9.3.

10.15.3 An audible trouble signal shall be permitted to be intermittent provided it sounds at least once every 10 seconds, with a minimum duration of ½ second.

10.15.4 A single audible trouble signal shall be permitted to annunciate multiple fault conditions.

10.15.5 The audible trouble notification appliances shall be located in an area where they are to be heard.

10.15.6 Activated notification appliances at the protected premises shall continue to operate unless they are manually silenced as permitted by 10.15.10.1.

10.15.7 Visible and audible trouble signals and visible indication of their restoration to normal shall be indicated at the following locations:

(1) Fire alarm control unit for protected premises alarm systems
(2) Building fire command center for in-building fire emergency voice/alarm communications systems
(3) Emergency command center for one or more buildings where responsible authorities receive and disseminate information
(4) Central station or remote station location for systems installed in compliance with Chapter 26

10.15.8 Trouble signals and their restoration to normal shall be visibly and audibly indicated at the proprietary supervising station for systems installed in compliance with Chapter 26.

10.15.9* A trouble signal that has been deactivated at the protected premises shall comply with 10.15.9.1 and 10.15.9.2.

10.15.9.1 The audible and visible trouble signal shall automatically reactivate at the control unit every 24 hours or less until trouble signal conditions are restored to normal.

10.15.9.2 The audible and visible trouble signal associated with signaling the depletion or failure of the primary battery of a wireless system as required by 23.16.2.1.1 and 23.16.2.3 shall automatically resound every 4 hours or less until the depletion signal is restored to normal.

10.15.10 Trouble Notification Appliance Deactivation.

10.15.10.1 A means for deactivating trouble notification appliances shall be permitted.

10.15.10.2 The means shall be key-operated or located within a locked cabinet, or arranged to provide equivalent protection against unauthorized use.

10.15.10.3 The means for deactivating trouble notification appliances shall comply with the requirements of 10.18.2.

10.15.10.4 If an audible trouble notification appliance is also used to indicate a supervisory condition, as permitted by 10.10.4, a trouble notification appliance deactivation means shall not prevent subsequent actuation of supervisory notification appliances.

10.15.10.5 Subsequent trouble signals shall cause trouble notification appliances to activate as required by the system input/output matrix.

10.15.10.6 A means for deactivating trouble notification appliances that remains in the deactivated position when there is no trouble condition shall operate an audible trouble notification appliance until the means is restored to normal.

10.15.10.7* Unless otherwise permitted by the authority having jurisdiction, trouble notification appliances at the protected premises of a supervising station fire alarm system arranged in accordance with Chapter 26, that have been silenced at the protected premises shall automatically reactivate every 24 hours or less until fault conditions are restored to normal.

10.16 Emergency Control Function Status Indicators.

10.16.1 All controls provided specifically for the purpose of manually overriding any automatic emergency control function shall provide visible indication of the status of the associated control circuits.

10.16.2* Where status indicators are provided for emergency equipment or control functions, they shall be arranged to reflect the actual status of the associated equipment or function.

10.17 Notification Appliance Circuits and Supervised Notification Appliance Control Circuits.

10.17.1 An open, ground-fault, or short-circuit fault on the installation conductors of one alarm notification appliance circuit shall not affect the operation of any other alarm notification appliance circuit for more than 200 seconds regardless of whether the short-circuit fault is present during the normal or activated circuit state.

10.17.2 Supervised notification appliance control circuits shall comply with all of the following:

(1) A supervised notification appliance control circuit shall not serve more than one notification zone.
(2) The supervised notification appliance control circuit shall be monitored for integrity in accordance with Section 12.6.
(3) A fault in the supervised notification appliance control circuit installation conductors shall result in a trouble signal in accordance with Section 10.15.

10.18 Annunciation and Annunciation Zoning.

10.18.1 Alarm Annunciation. Where required by other governing laws, codes, or standards, the location of an operated initiating device shall be annunciated by visible means.

10.18.1.1 Visible annunciation of the location of an operated initiating device shall be by an indicator lamp, alphanumeric display, printout, or other approved means.

10.18.1.2* The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.

10.18.2 Supervisory and Trouble Annunciation. Where required by other governing laws, codes, or standards, supervisory or trouble conditions shall be annunciated by visible means.

10.18.2.1 Visible annunciation shall be by an indicator lamp, an alphanumeric display, a printout, or other means.

10.18.2.2 The visible annunciation of supervisory or trouble conditions shall not be canceled by the means used to deactivate supervisory or trouble notification appliances.

10.18.3* Annunciator Access and Location.

10.18.3.1 All required annunciation means shall be readily accessible to responding personnel.

10.18.3.2 All required annunciation means shall be located as required by the authority having jurisdiction to facilitate an efficient response to the situation.

10.18.4 Alarm Annunciation Display. Visible annunciators shall be capable of displaying all zones in alarm.

10.18.4.1 If all zones in alarm are not displayed simultaneously, the zone of origin shall be displayed.

10.18.4.2 If all zones in alarm are not displayed simultaneously, there shall be an indication that other zones are in alarm.

10.18.5* Annunciation Zoning.

10.18.5.1 For the purpose of alarm annunciation, each floor of the building shall be considered as a separate zone.

10.18.5.2 For the purposes of alarm annunciation, if a floor of the building is subdivided into multiple zones by fire or smoke barriers and the fire plan for the protected premises allows relocation of occupants from the zone of origin to another zone on the same floor, each zone on the floor shall be annunciated separately.

10.18.5.3 Where the system serves more than one building, each building shall be annunciated separately.

10.18.6* Emergency Services Interfaces. Where required by the enforcing authority; governing laws, codes, or standards; or other parts of this Code, annunciators, information display systems, and controls for portions of a system provided for use by emergency service personnel shall be designed, arranged, and located in accordance with the requirements of the organizations intended to use the equipment.

10.19 Monitoring Integrity of In-Building Fire Emergency Voice/Alarm Communications Systems.

10.19.1* Audio Amplifier and Tone-Generating Equipment. If loudspeakers are used to produce audible fire alarm signals, the required trouble signal for 10.19.1.1 through 10.19.1.3 shall be in accordance with Section 10.15.

10.19.1.1 When primary power is available, failure of any audio amplifier shall result in a trouble signal.

10.19.1.2 When an alarm is present and primary power is not available (i.e., system is operating from the secondary power source), failure of any audio amplifier shall result in a trouble signal.

10.19.1.3* Failure of any tone-generating equipment shall result in a trouble signal, unless the tone-generating and amplifying equipment are enclosed as integral parts and serve only a single, listed loudspeaker.

10.19.2 Two-Way Telephone Communications Circuits.

10.19.2.1 Two-way telephone communications circuit installation conductors shall be monitored for open circuit fault conditions that would cause the telephone communications circuit to become fully or partially inoperative.

10.19.2.2 Two-way telephone communications circuit installation conductors shall be monitored for short circuit fault conditions that would cause the telephone communications circuit to become fully or partially inoperative.

10.19.2.3 Two-way telephone communications circuit fault conditions shall result in a trouble signal in accordance with Section 10.15.

10.20 Documentation and Notification.

10.20.1 Documentation shall be in accordance with Chapter 7.

10.20.2 The authority having jurisdiction shall be notified prior to installation or alteration of equipment or wiring.

10.21* Impairments.

Δ **10.21.1** The system owner or the owner's designated representative shall be notified within 8 hours when a system or part thereof is impaired.

N **10.21.2** Impairments to systems shall include out-of-service events.

10.21.3 A record of the impairments shall be maintained by the system owner or the owner's designated representative for a period of 1 year from the date the impairment is corrected.

10.21.4 The supervising station shall report to the authority having jurisdiction any system for which required monitoring has been terminated.

10.21.5* The service provider shall report to the authority having jurisdiction any system that is out of service for more than 8 hours.

10.21.6* Where required by the authority having jurisdiction, mitigating measures shall be implemented for the period that the system is impaired.

10.21.7 The system owner or the owner's designated representative and the authority having jurisdiction shall be notified when an impairment period ends.

10.22* Unwanted Alarms. For the purpose of reporting, alarm signals that are not the result of hazardous conditions shall be classified as Unwanted and subclassified as one of the following:

(1) Malicious alarm
(2) Nuisance alarm
(3) Unintentional alarm
(4) Unknown alarm

Chapter 11 Cybersecurity

Δ 11.1 Cybersecurity Provisions.

N **11.1.1*** Where required by governing laws, codes, or standards, or other parts of this Code, cybersecurity shall be provided in accordance with Chapter 11 for equipment software, system support tools, installation methods, physical security of and access to equipment, data pathways, testing, and maintenance.

N **11.1.2*** No minimum cybersecurity level shall be required for systems that meet both of the following conditions:

(1) No network connectable equipment
(2) No uploadable software configuration

N **11.2* Network Connectable Equipment Software Development and Production Environments.** Development and production environments used to develop and manufacture network connectable equipment shall employ cybersecurity safeguards that are consistent with one or more of the following:

(1) NIST's "Framework for Improving Critical Infrastructure Cybersecurity"
(2) ISO/IEC 27001, *Information security management systems*
(3) IASME Consortium Cyber Essentials
(4) Other equivalent standards acceptable to a nationally recognized testing laboratory
(5)* Other applicable laws and regulations

N **11.3* Security Levels for Network Connectable Equipment.** All interfaces used to communicate with network connectable equipment shall be protected in accordance with the following:

(1) For non-internet-protocol wired interfaces, one of the following:
  (a) Security Level 1 (SL1) in accordance with ANSI/ISA/IEC 62443-4-2, *Security for Industrial Automation and Control Systems, Part 4-2: Technical Security Requirements for IACS Components*
  (b) Security Level 1 (SL1) in accordance with ANSI/ISA/IEC 62443-3-3, *Security for Industrial Automation and Control Systems, Part 3-3: System Security Requirements and Security Levels*
  (c) Security Level 1 (SL1) in accordance with CAN/UL 2900-2-3, *Software Cybersecurity for Network-Connectable Products, Part 2-3: Particular Requirements for Security and Life Safety Signaling Systems*
  (d) Comparable level associated with Section 11.2(4)
(2) For non-internet-protocol wireless interfaces, or internet protocol wired and wireless interfaces that do not connect to publicly accessible networks, one of the following:
  (a) Security Level 2 (SL2) in accordance with ANSI/ISA/IEC 62443-4-2
  (b) Security Level 2 (SL2) in accordance with ANSI/ISA/IEC 62443-3-3
  (c) Security Level 2 (SL2) in accordance with CAN/UL 2900-2-3
  (d) Comparable level associated with Section 11.2(4)
(3) For internet protocol wired or wireless interfaces that connect to publicly accessible networks, one of the following:
  (a) Security Level 3 (SL3) in accordance with ANSI/ISA/IEC 62443-4-2
  (b) Security Level 3 (SL3) in accordance with ANSI/ISA/IEC 62443-3-3
  (c) Security Level 3 (SL3) in accordance with CAN/UL 2900-2-3
  (d) Comparable level associated with Section 11.2(4)

N **11.4* Interconnecting Conductors, Cables, or Other Physical Pathways.** Interconnecting conductors, cables, or other physical pathways for use in Security Level 2 or higher applications in locations accessible to the public shall be protected by metal raceways or metal armored cables.

N **11.5 Network Connectable Equipment Using Shared Pathways.**

N **11.5.1** Network connectable equipment using the security levels required by Section 11.3(2) through Section 11.3(3) shall comply with 23.6.3.3 through 23.6.3.5 and 7.6.7.

N **11.5.2** Network connectable equipment using Shared Pathway Level 0, Shared Pathway Level 1, or Shared Pathway Level 2 shall comply with 23.6.3.3 through 23.6.3.5 and 7.6.7.

N **11.6 Unused Physical Data Ports.** All unused physical data ports shall be protected in at least one of the following ways:

(1) Physically protected from unauthorized access
(2) Administratively disabled
(3) Configured to require a token-based authentication, certificate-based authentication, password, or other method that is consistent with the security requirements of the system

N **11.7* Data Connections to External Networks.** When any data connection is made from the system to an external network, the connection shall be protected by a gateway or firewall that ensures that only trusted traffic is allowed to pass.

N **11.8 Network Connectable Equipment Cybersecurity Software Updates.**

N **11.8.1** At least quarterly, the equipment manufacturer(s) shall do the following until the equipment is no longer supported by the manufacturer:

(1) Evaluate all relevant cybersecurity threats
(2) Determine if a software update is required to maintain the cybersecurity level achieved in compliance with Section 11.2

N **11.8.2** The system installer shall provide the name and contact information of the system owner or their representative to the equipment manufacturer(s) at the time of system acceptance testing.

N **11.8.3*** The equipment manufacturer(s) shall notify the system owner or their representative of all required software security updates required to maintain the cybersecurity level achieved in compliance with Sections 11.2, 11.3, and 11.4.

N **11.8.4** Software for network connectable devices shall be maintained by installing software security updates as required by the equipment manufacturer(s) to maintain the cybersecurity level achieved in compliance with Sections 11.2, 11.3, and 11.4.

N **11.8.5** Software security updates that are deemed necessary by the equipment manufacturer(s) for compliance with Section 11.3 shall be installed at least annually.

N **11.8.6** Cybersecurity software updates applied to gateways or firewalls that do not affect the system site-specific or system executive software shall not be required to comply with 14.4.2.

N **11.8.7** Cybersecurity software changes to systems or system components shall be permitted to be made by remote access in accordance with 23.8.2.11.3.

N **11.9 Notification of Termination of Cybersecurity Update Support.** The manufacturer shall notify the system owner or their representative of the termination of cybersecurity software update support required by Section 11.8 for any element of the system.

N **11.10 Cybersecurity for System Support Tools.** A system support tool and the support tool interfaces shall comply with the requirements of Sections 11.2 through 11.9.

N **11.11 Evidence of Compliance.**

N **11.11.1** Evidence of cybersecurity compliance shall include one or more of the following:

(1) Certification of compliance by a nationally recognized testing laboratory
(2) Manufacturer certification for the specific type and brand of system provided by the manufacturer
(3) An assessment or certification program acceptable to the authority having jurisdiction

N **11.11.2** The validity of cybersecurity certificates shall be verified annually by the person testing the system.

N **11.11.3** The validity of the equipment manufacturer's contact information for the system owner shall be verified annually by the person testing the system.

N **11.12 Documentation.** The standards used and security levels employed in complying with Chapter 11 shall be identified in the system documentation required by Chapter 7.

Chapter 12 Circuits and Pathways

12.1 Application. Pathways shall be designated based on the performance characteristics defined in this chapter.

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12.2 General.

Δ **12.2.1*** Performance and survivability of signaling pathways shall comply with the defined designations of this chapter.

Δ **12.2.2** A pathway class designation shall be dependent on the pathway performance during abnormal conditions.

12.2.3 The installation of all pathway wiring, cable, and equipment shall be in accordance with *NFPA 70* and the applicable requirements of 12.2.3.1 through 12.2.3.4.

12.2.3.1 Optical fiber cables installed as part of the fire alarm system shall meet the requirements of Article 770 of *NFPA 70* and be protected against physical damage in accordance with Article 760 of *NFPA 70*.

12.2.3.2 Optical fiber cables entering from outside the building or structure shall also comply with Article 840 of *NFPA 70*.

12.2.3.3* Fire alarm system wiring and equipment, including all circuits controlled and powered by the fire alarm system, shall be installed in accordance with the requirements of this Code and of Article 760 of *NFPA 70*.

12.2.3.4* Wiring methods permitted by other sections of this Code to resist attack by fire shall be installed in accordance with manufacturer's published instructions and the requirements of Articles 760 and 728 of *NFPA 70*.

12.2.3.5* Where operational performance of a pathway class designation is required to be maintained or continued during the occurrence of a fault, the operational performance required in 10.11.1 shall be restored within 200 seconds from the time the fault is introduced.

12.2.4 Ground Connections.

12.2.4.1 Unless otherwise permitted by 12.2.4.2, all fire alarm systems shall test free of grounds.

12.2.4.2 The requirements of 12.2.4.1 shall not be required where parts of circuits or equipment are intentionally and permanently grounded in order to provide ground fault detection, noise suppression, emergency ground signals, and circuit protection grounding.

12.2.4.3* On conductive pathways, operational performance shall be maintained during the application of a single ground connection.

12.3* Pathway Class Designations. Pathways shall be designated as Class A, Class B, Class C, Class D, Class E, Class N, or Class X, depending on their performance.

12.3.1* Class A. A pathway shall be designated as Class A when it performs as follows:

(1) It includes a redundant path.
(2) Operational capability continues past a single open, and the single open fault results in the annunciation of a trouble signal.
(3) Conditions that affect the intended operation of the path are annunciated as a trouble signal.
(4) Operational capability on metallic conductors is maintained during the application of a single ground fault.
(5) A single ground condition on metallic conductors results in the annunciation of a trouble signal.

12.3.2 Class B. A pathway shall be designated as Class B when it performs as follows:

(1) It does not include a redundant path.
(2) Operational capability stops at a single open.
(3) Conditions that affect the intended operation of the path are annunciated as a trouble signal.
(4) Operational capability on metallic conductors is maintained during the application of a single ground fault.
(5) A single ground condition on metallic conductors results in the annunciation of a trouble signal.

12.3.3* Class C. A pathway shall be designated as Class C when it performs as follows:

(1) It includes one or more pathways where operational capability is verified via end-to-end communication, but the integrity of individual paths is not monitored.
(2) A loss of end-to-end communication is annunciated as a trouble signal.

12.3.4* Class D. A pathway shall be designated as Class D when it has fail-safe operation, where no fault is annunciated, but the intended operation is performed in the event of a pathway failure.

12.3.5* Class E. A pathway shall be designated as Class E when it is not monitored for integrity.

Δ **12.3.6* Class N.** A pathway shall be designated as Class N when it performs as follows:

(1) When two or more endpoint devices depend on a pathway, it includes a redundant path to those devices.
(2) When only one endpoint device is connected, a single path is permitted.
(3) Operational capability of the pathway(s) to each device is verified through end-to-end communication.
(4) A loss of communications between endpoints results in the annunciation of a trouble signal.
(5) A single open, ground, short, or combination of these faults on one pathway does not affect any other pathway.
(6)* Conditions that affect the operation of the primary pathway(s) and redundant pathway(s) result in the annunciation of a trouble signal when the system's minimal operational requirements cannot be met.
(7)* Primary and redundant paths do not share traffic over the same physical segment.

12.3.7 Class X. A pathway shall be designated as Class X when it performs as follows:

(1) It includes a redundant path.
(2) Operational capability continues past a single open, and the single open fault results in the annunciation of a trouble signal.
(3) Operational capability on metallic conductors continues past a single short-circuit, and the single short-circuit fault results in the annunciation of a trouble signal.
(4) Operational capability on metallic conductors continues past a combination open fault and ground fault.
(5) Conditions that affect the intended operation of the path are annunciated as a trouble signal.
(6) Operational capability on metallic conductors is maintained during the application of a single ground fault.