

Chapter 1 Administration

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

A.1.2.4 Some building and fire codes include requirements that imply NFPA 72 requirements that do not exist. The intent of this paragraph is to make it clear that the protection requirements are derived from the applicable building or fire code, not from NFPA 72

(ADDITIONAL ANNEX A MATERIAL)

1.3.1 (2) Protected premises (local) fire alarm systems
(THE WORD "LOCAL" HAS BEEN ADDED)

1.3.1 (3)(a) Central station (service) fire alarm systems
(THE WORD "SERVICE" HAS BEEN ADDED)

1.6 Units and Formulas.

1.6.1 The units of measure in this Code are presented in the International System (SI) of units. Where presented, U.S. customary units (inch-pound units) follow the SI units in parentheses.

(MODIFIED)

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

(NEW)

1.6.3 Where both systems of units are presented, users of this Code shall apply one set of units consistently and shall not alternate between units.

(NEW)

1.6.4* The values presented for measurements in this Code are expressed with a degree of precision appropriate for practical application and enforcement. It is not intended that the application or enforcement of these values be more precise than the precision expressed.

A.1.6.4 Where dimensions are expressed in millimeters and inches, it is intended that the precision of the measurement be 1 in., thus plus or minus ½ in. The conversion and presentation of dimensions in millimeters would then have a precision of 25 mm, thus plus or minus 13 mm.

(NEW)

NFPA 72-2007 Changes

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

(NEW)

Chapter 2 Referenced Publications updated the versions of publications

Chapter 3 Definitions

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

(NEW)

3.3.5 Alarm. A warning of danger.

(THE WORD "FIRE" AHEAD OF THE WORD DANGER WAS REMOVED)

3.3.12 Apartment Building. A building or portion thereof containing three or more dwelling units with independent cooking and bathroom facilities.

(THE WORDS "OR PORTION THEREOF" WAS ADDED)

3.3.18* 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)

(MATERIAL WAS ADDED TO ANNEX A)

"Central Station" is now "Central Supervising Station" and "Central Station Service"

"Proprietary Supervising Station" is now "Proprietary Supervising Station" and "Proprietary Supervising Station Service"

"Remote Supervising Station" is now "Remote Supervising Station" and "Remote Supervising Station Service"

The definition of the term "Certification" was removed.

3.3.39.1 Wireless Control Unit. A component that transmits/receives and processes wireless signals.

(NEW)

3.3.43.4* **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. Typical examples are a combination of a heat detector with a smoke detector or a combination rate-of-rise and fixed-temperature heat detector. This device has listings for each sensing method employed.

A.3.3.43.4 **Combination Detector.** These detectors do not utilize a mathematical evaluation principle of signal processing more than a simple “or” function. Normally, these detectors provide a single response resulting from either sensing method, each of which operates independent of the other. These detectors can provide a separate and distinct response resulting from either sensing method, each of which is processed independent of the other.

(MATERIAL WAS ADDED TO ANNEX A)

3.3.43.11* **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.

A.3.3.43.11 **Multi-Criteria Detector.** A multi-criteria detector is a detector that contains multiple sensing methods that respond to fire signature phenomena and utilizes mathematical evaluation principles to determine the collective status of the device and generates a single output. Typical examples of multi-criteria detectors are a combination of a heat detector with a smoke detector, or a combination rate-of-rise and fixed-temperature heat detector that evaluates both signals using an algorithm to generate an output such as pre-alarm or alarm. The evaluation can be performed either at the detector or at the control unit. Other examples are detectors that include sensor combinations that respond in a predictable manner to any combination of heat, smoke, carbon monoxide, or carbon dioxide.

(NEW)

NFPA 72-2007 Changes

3.3.43.12* 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.

A.3.3.43.12 Multi-Sensor Detector. Typical examples of multi-sensor detectors are a combination of a heat detector with a smoke detector, or a combination rate-of-rise and fixed-temperature heat detector that evaluates both signals using an algorithm to generate an output such as pre-alarm or alarm. The evaluation can be performed either at the detector or at the control unit. Other examples are detectors that include sensor combinations that respond in a predictable manner to any combination of heat, smoke, carbon monoxide, or carbon dioxide.

(NEW)

3.3.64* Fire Alarm Control Unit. A component of the fire alarm system, provided with primary and secondary power sources, which 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).

A.3.3.64 Fire Alarm Control Unit. In addition to the functions identified in the definition, a fire alarm control unit might have an integral operator interface, supply power to detection devices, notification appliances, transponder(s), or off-premises transmitter(s) or any combination of these. The control unit might also provide transfer of condition to relay or devices connected to the control unit. There can be multiple fire alarm control units in a fire alarm system.

(RE-WRITTEN AND MATERIAL ADDED TO ANNEX A)

3.3.67.1* Auxiliary Fire Alarm System. A system used to connect a protected premises fire alarm system to a public fire alarm reporting system for transmitting an alarm to the public fire service communications center. (SIG-PRS)

A.3.3.67.1 Auxiliary Fire Alarm System. Fire alarms from an auxiliary fire alarm system are received at the public fire service communications center on the same equipment and by the same methods as alarms transmitted from public fire alarm boxes. (SIG-PRS)

(MODIFIED)

3.3.67.1.1 Local Energy Type Auxiliary Fire 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 fire alarm reporting system circuits.

(MODIFIED)

NFPA 72-2007 Changes

3.3.67.1.2 Shunt-Type Auxiliary Fire Alarm System. An auxiliary system electrically connected to the public fire alarm reporting system extending a public fire alarm reporting circuit to interconnect initiating devices within a protected premises, which, when operated, opens the public fire alarm reporting circuit shunted around the trip coil of the master box or auxiliary box. The master box or auxiliary box is thereupon energized to start transmission without any assistance from a local source of power.

(MODIFIED)

3.3.67.3 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.

(MODIFIED)

3.3.67.4 Municipal Fire Alarm System. A public fire alarm reporting system.

(MODIFIED)

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

A.3.3.67.5 Protected Premises (Local) Fire Alarm System. A protected premises fire alarm system is any fire alarm system located at the protected premises. It can include any of the functions identified in Section 6.3. Where signals are transmitted to a public fire communication center or supervising station, the protected premises fire alarm system also falls under the definition of one of the following systems: central station service fire alarm system, remote supervising station fire alarm system, proprietary supervising station fire alarm system, or auxiliary fire alarm system. The requirements that pertain to these systems apply in addition to the requirements for the protected premises fire alarm systems.

(MODIFIED)

3.3.67.5.1 Building Fire Alarm System. A protected premises fire alarm system that includes any of the features identified in 6.3.3.1 and that serves the general fire alarm needs of a building or buildings and that provides fire department or occupant notification or both.

(NEW)

3.3.67.5.2 Dedicated Function Fire Alarm System. A protected premises fire alarm system installed specifically to perform fire safety function(s) where a building fire alarm system is not required.

(NEW)

NFPA 72-2007 Changes

3.3.67.5.3 Releasing Fire Alarm System. A protected premises fire alarm system that is part of a fire suppression system and/or which provides control inputs to a fire suppression system related to the fire suppression systems sequence of operations and outputs for other signaling and notification.

(NEW)

3.3.67.6 Public Fire Alarm Reporting System. A system of alarm-initiating devices, receiving equipment, and communication infrastructure (other than a public telephone network) used to transmit alarms to the public fire service communications center to provide any combination of manual or auxiliary fire alarm service.

(MODIFIED)

3.3.67.7 Supervising Station Fire Alarm Systems.

(NEW)

3.3.67.7.1 Central Station Service Fire 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 fire alarm systems.

(MODIFIED)

3.3.67.7.2 Proprietary Supervising Station Fire Alarm System. An installation of fire alarm systems that serves contiguous and noncontiguous properties, under one ownership, from a proprietary supervising station located at the protected premises, or at one of multiple non-contiguous 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.

(MODIFIED)

3.3.67.7.3 Remote Supervising Station Fire Alarm System. A protected premises fire alarm system (exclusive of any connected to a public fire 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.

(MODIFIED)

NFPA 72-2007 Changes

3.3.69 Fire Extinguisher Monitoring Device. A device connected to a control unit that monitors the fire extinguisher in accordance with the requirements of NFPA 10, Standard for Portable Fire Extinguishers.

(NEW)

3.3.90 Intermediate Fire Alarm or Fire Supervisory Control Unit. See 3.3.39, Control Unit.

(DELETED)

3.3.102* Mass Notification System. A system used to provide information and instructions to people, in a building, area site, or other space.

A.3.3.102 Mass Notification System. A mass notification system may use intelligible voice communications, visible signals, text, graphics, tactile, or other communications methods. The system may be used to initiate evacuation or relocation or to provide information to occupants. The system may be intended for fire emergencies, weather emergencies, terrorist events, biological, chemical or nuclear emergencies, or any combination of these. The system may be automatic, manual, or both. Access to and control of the system may be from a single, on-site location or may include multiple command locations, including some remote from the area served. Systems may be wired, wireless, or some combination of the two.

(NEW)

3.3.111* Nonrequired. A fire alarm 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.

A.3.3.111 Nonrequired. There are situations where the applicable building or fire code does not require the installation of a fire alarm system or specific fire alarm system components, but the building owner wants to install a fire alarm system or component to meet site-specific needs or objectives. A building owner always has the option of installing protection that is above the minimum requirements of the Code. It is the intent of the Code that any fire alarm system, or fire alarm system components installed voluntarily by a building owner, meet the requirements of the applicable portions of the Code. However, it is not the intent of the Code that the installation of a nonrequired fire alarm system, or fire alarm system components, trigger requirements for the installation of additional fire alarm system components or features. For example, the installation of a fire alarm control unit and fire detectors to service a specific area, such as a computer room or flammable liquid storage room, does not trigger a requirement for audible or visible notification appliances, manual fire alarm boxes, or other fire alarm system features in other parts of the building.

(MATERIAL ADDED TO ANNEX A)

3.3.113.1.1 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.

(NEW)

NFPA 72-2007 Changes

3.3.117* Occupiable Area. The spaces of a facility that can be occupied or used by the facility occupants as part of the building function or to support building operations and maintenance. This includes, but is not limited to, storage areas, mechanical and electrical equipment areas, walk-in closets or janitor's rooms, restrooms, conference rooms, and individual offices.

A.3.3.117 Occupiable Area. The space above a suspended ceiling that does not have permanent walkways or in crawl spaces or attics that do not contain building support equipment is not considered an occupiable space. If a large attic or crawl space contains building support equipment in one area only, notification appliances would only be required in the area of the building support equipment where the potential exists for building maintenance personnel being present for equipment maintenance.

(DELETED)

3.3.123* Ownership. Any property or building or its contents under legal control by the occupant, by contract, or by holding of a title or deed.

A.3.3.123 Ownership. Inspection, testing and maintenance is the responsibility of the property or building owner, or it can be transferred by contract. Systems installed, owned, or leased by a tenant are the responsibility of the tenant. The installing company should provide written notice of these responsibilities to the system user.

(ADDITIONAL ANNEX A MATERIAL)

3.3.143 Protected Premises (Local) Control Unit. See 3.3.64, Fire Alarm Control Unit.

(NEW)

3.3.158 Remote Supervising Station. See 3.3.194, Supervising Station.

(NEW)

3.3.160 Remote Supervising Station Service. See 3.3.195, Supervising Station Service.

(NEW)

3.3.167 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.

(NEW)

3.3.170 Separate Sleeping Area. The area of a dwelling unit where the bedrooms or sleeping rooms are located.

(NEW)

3.3.172.1 Alarm Signal. A signal indicating an emergency condition or an alert that requires action.

(MODIFIED)

NFPA 72-2007 Changes

3.3.172.7 Trouble Signal. A signal initiated by a system or device indicative of a fault in a monitored circuit, system, or component.

(MODIFIED)

3.3.173 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.

(MODIFIED)

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

A.3.3.181.5 Video Image Smoke Detection (VISD). Video image smoke detection (VISD) is a software-based method of smoke detection that has become practical with the advent of digital video systems. Listing agencies have begun testing VISD components for several manufacturers. VISD systems can analyze images for changes in features such as brightness, contrast, edge content, loss of detail, and motion. The detection equipment can consist of cameras producing digital or analog (converted to digital) video signals and processing unit(s) that maintain the software and interfaces to the fire alarm control unit.

(NEW)

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

A.3.3.209 Video Image Flame Detection (VIFD). Video image flame detection (VIFD) is a software-based method of flame detection that can be implemented by a range of video image analysis techniques. VIFD systems can analyze images for changes in features such as brightness, contrast, edge content, loss of detail, and motion. The detection equipment can consist of cameras producing digital or analog (converted to digital) video signals and processing unit(s) that maintain the software and interfaces to the fire alarm control unit.

(NEW)

3.3.214 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.

(NEW)

3.3.214.2 Notification Zone. An area covered by notification appliances that are activated simultaneously.

(DELETED)

Chapter 4 Fundamentals

4.3.1 Equipment. Equipment constructed and installed in conformity with this Code shall be listed for the purpose for which it is used. Fire alarm system components shall be installed, tested, and maintained in accordance with the manufacturer's published instructions and this Code.

(ADDED "... TESTED, AND MAINTAINED ..." "... AND THIS CODE")

4.3.2.2 The system designer shall be identified on the system design documents. Acceptable evidence of qualifications or certification shall be provided when requested by the authority having jurisdiction. Qualified personnel shall include, but not be limited to, one or more of the following:

- (1) Personnel who are factory trained and certified for fire alarm system design of the specific type and brand of system being designed
- (2)* Personnel who are certified by a nationally recognized fire alarm certification organization acceptable to the authority having jurisdiction
A.4.3.2.2(2) Nationally recognized fire alarm certification programs might include those programs offered by the International Municipal Signal Association (IMSA) and National Institute for Certification in Engineering Technologies (NICET).
Note: These organizations and the products or services offered by them have not been independently verified by the NFPA, nor have the products or services been endorsed or certified by the NFPA or any of its technical committees
- (3) Personnel who are registered, licensed, or certified by a state or local authority

(RE-WORDED AND ANNEX MATERIAL MODIFIED)

4.3.3 System Installer. Installation personnel shall be qualified or shall be supervised by persons who are qualified in the installation, inspection, and testing of fire alarm systems. Evidence of qualifications or certification shall be provided when requested by the authority having jurisdiction. Qualified personnel shall include, but not be limited to, one or more of the following:

- (1) Personnel who are factory trained and certified for fire alarm system installation of the specific type and brand of system being installed
- (2)* Personnel who are certified by a nationally recognized fire alarm certification organization acceptable to the authority having jurisdiction
A.4.3.3(2) Nationally recognized fire alarm certification programs might include those programs offered by the International Municipal Signal Association (IMSA) and National Institute for Certification in Engineering Technologies (NICET).
Note: These organizations and the products or services offered by them have not been independently verified by the NFPA, nor have the products or services been endorsed or certified by the NFPA or any of its Technical Committees.
- (3) Personnel who are registered, licensed, or certified by a state or local authority

(RE-WORDED AND ANNEX MATERIAL MODIFIED)

NFPA 72-2007 Changes

4.4.1.8.3.5 A rectifier employed as a battery charging supply source shall be of adequate capacity. A rectifier employed as a charging means shall be energized by an isolating transformer.

(DELETED)

4.4.1.5.1* Secondary Power Supply for Protected Premises Fire Alarm Systems. The secondary power supply shall consist of one of the following:

- (1) A storage battery dedicated to the fire alarm system arranged in accordance with 4.4.1.8
- (2) An automatic starting, engine-driven generator serving the dedicated branch circuit specified in 4.4.1.4.1 and arranged in accordance with 4.4.1.9.3.1 and storage batteries dedicated to the fire alarm system with 4 hours of capacity arranged in accordance with 4.4.1.8

A.4.4.1.5.1 The secondary power supply is not required to supply power to the fire alarm system through parallel distribution paths. Automatic transfer switches are commonly used to allow secondary power to be supplied over the same distribution system as the primary power.

The generator does not need to be dedicated to the fire alarm system.

(MODIFIED AND NEW ANNEX A MATERIAL)

4.4.1.7.1 Additional power supplies, where provided for control units, circuit interfaces, or other equipment essential to system operation, and located remotely from the main control unit, shall be comprised of a primary and secondary power supply that shall meet the same requirements as those of 4.4.1.1 through 4.4.1.6 and 4.4.7.3.

(MODIFIED)

4.4.1.7.2 The location of any remotely located power supply shall be identified at the master control unit as well as on the record drawings. Identification on the control unit display shall be acceptable.

(NEW)

4.4.1.8* Storage Batteries.

A.4.4.1.8 The following newer types of rechargeable batteries are normally used in protected premises applications:

- (1) *Vented Lead-Acid, Gelled, or Starved Electrolyte Battery*. This rechargeable-type battery is generally used in place of primary batteries in applications that have a relatively high current drain or that require the extended standby capability of much lower currents. The nominal voltage of a single cell is 2 volts, and the battery is available in multiples of 2 volts (e.g., 2, 4, 6, 12). Batteries should be stored according to the manufacturer's published instructions.

(ITEM #1 ANNEX A MATERIAL MODIFIED)

NFPA 72-2007 Changes

4.4.1.8.1* Marking. Batteries shall be permanently marked with the month and year of manufacture, using the month/year format.

A.4.4.1.8.1 Markings for month and year can be applied by the manufacturer or in the field on the basis of the manufacturer's date code.

(MODIFIED)

4.4.1.9.6.2 Where gasoline-fueled generators are used, fuel shall be supplied from a frequently replenished tank, or other means provided, to ensure that the gasoline is always fresh.

(DELETED)

4.4.2 Compatibility. All detection devices that receive their power from the initiating device circuit or signaling line circuit of a control unit shall be listed for use with the control unit.

(MODIFIED)

4.4.3.5.1 Trouble signals and their restoration to normal shall be indicated within 200 seconds at the locations identified in 4.4.3.5.6 or 4.4.3.5.7. Indication of primary power failure trouble signals transmitted to a supervising station shall be delayed in accordance with 4.4.7.3.3.

(EXCEPTION LANGUAGE INCORPORATED INTO SHALL LANGUAGE)

4.4.3.7* Alarm Signal Deactivation.

A.4.4.3.7 It is the intent that both visual and audible appliances are shut off when the signal silence feature is activated on the fire alarm control unit.

Per the ADA, it is important not to provide conflicting signals for the hearing impaired.

4.4.3.7.1 A means for turning off activated alarm notification appliance(s) shall be permitted only if it complies with 4.4.3.7.3 through 4.4.3.7.6.

4.4.3.7.2 When an alarm signal deactivation means is actuated, both audible and visible notification appliances shall be simultaneously deactivated.

(RE-WORDED AND ADDITIONAL ANNEX MATERIAL PROVIDED)

NFPA 72-2007 Changes

4.4.5* Protection of Fire Alarm System. In areas that are not continuously occupied, automatic smoke detection shall be provided at the location of each fire alarm control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment to provide notification of fire at that location.

Exception No. 1: Where ambient conditions prohibit installation of automatic smoke detection, automatic heat detection shall be permitted.

Exception No. 2: Fully sprinklered buildings shall not require protection in accordance with 4.4.5.

A.4.4.5 The fire alarm control unit(s) that are to be protected are those that provide notification of a fire to the occupants and responders. The term fire alarm control unit does not include equipment such as annunciators and addressable devices. Requiring smoke detection at the transmitting equipment is intended to increase the probability that an alarm signal will be transmitted to a supervising station prior to that transmitting equipment being disabled due to the fire condition.

CAUTION: Exception No. 1 to 4.4.5 permits the use of a heat detector if ambient conditions are not suitable for smoke detection. It is important to also evaluate whether the area is suitable for the control unit.

Where the area or room containing the control unit is provided with total smoke detection coverage, additional smoke detection is not required to protect the control unit. Where total smoke-detection coverage is not provided, the Code intends that only one smoke detector is required at the control unit even when the area of the room would require more than one detector if installed according to the spacing rules in Chapter 5. The intent of selective coverage is to address the specific location of the equipment.

Location of the required detection should be in accordance with one of the following:

- (1) Where the ceiling is 15 ft in height or less, the smoke detector should be located on the ceiling or the wall within 21 ft of the centerline of the fire alarm control unit being protected by the detector in accordance with 5.7.3.2.1.
- (2) Where the ceiling exceeds 15 ft in height, the automatic smoke detector should be installed on the wall above and within 6 ft from the top of the control unit.

(RE-WORDED AND ADDITIONAL ANNEX A MATERIAL PROVIDED)

4.4.6.1 Alarm Annunciation. Where required, the location of an operated initiating device shall be annunciated by visible means. Visible annunciation shall be by an indicator lamp, alphanumeric display, printout, or other approved means. The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.

(MODIFIED)

NFPA 72-2007 Changes

4.4.6.2 Supervisory and Trouble Annunciation. Where required, supervisory and/or trouble annunciation shall be annunciated by visible means. Visible annunciation shall be by an indicator lamp, alphanumeric display, printout, or other means. The visible annunciation of supervisory and/or trouble conditions shall not be canceled by the means used to deactivate supervisory or trouble notification appliances.

(MODIFIED)

4.4.6.3* Annunciator Access and Location. All required annunciation means shall be readily accessible to responding personnel and shall be located as required by the authority having jurisdiction to facilitate an efficient response to the fire situation.

(MODIFIED)

4.4.6.4 Alarm Annunciation Display. Visible annunciators shall be capable of displaying all zones in alarm. If all zones in alarm are not displayed simultaneously, the zone of origin shall be displayed and there shall be an indication that other zones are in alarm.

(MODIFIED)

4.4.6.5 Fire Command Center. Annunciation at the fire command center shall be by means of audible and visible indicators.

(MODIFIED)

NFPA 72-2007 Changes

4.4.6.6* Annunciation Zoning.

4.4.6.6.1 For the purpose of alarm annunciation, each floor of the building shall be considered as a separate zone. If a floor is subdivided 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 for purposes of alarm location.

A.4.4.6.6 Fire alarm system annunciation should, as a minimum, be sufficiently specific to identify a fire alarm signal in accordance with the following:

- (1) If a floor exceeds 22,500 ft² in area, the floor should be subdivided into detection zones of 22,500 ft² or less, consistent with the existing smoke and fire barriers on the floor.
- (2) If a floor exceeds 22,500 ft² in area and is undivided by smoke or fire barriers, detection zoning should be determined on a case-by-case basis in consultation with the authority having jurisdiction.
- (3) Waterflow switches on sprinkler systems that serve multiple floors, areas exceeding 22,500 ft², or areas inconsistent with the established detection system zoning should be annunciated individually.
- (4) In-duct smoke detectors on air-handling systems that serve multiple floors, areas exceeding 22,500 ft², or areas inconsistent with the established detection system zoning should be annunciated individually.
- (5) If a floor area exceeds 22,500 ft², additional zoning should be provided. The length of any zone should not exceed 300 ft in any direction. If the building is provided with automatic sprinklers throughout, the area of the alarm zone should be permitted to coincide with the allowable area of the sprinkler zone.

(MODIFIED)

4.4.6.6.2 Where the system serves more than one building, each building shall be annunciated separately.

(MODIFIED)

4.4.6.1.2* Zone of Origin. Fire alarm systems serving two or more zones shall identify the zone of origin of the alarm initiation by annunciation or coded signal.

(DELETED)

4.4.7.1.2 Shorts between conductors shall not be required to be monitored for integrity, unless required by 4.4.7.1.17 and 4.4.7.2.2.

(MODIFIED)

4.4.7.1.17 A wire-to-wire short-circuit fault on any alarm notification appliance circuit shall result in a trouble signal in accordance with 4.4.3.5, except as permitted by 4.4.7.1.4, 4.4.7.1.5, or 4.4.7.1.10.

(MODIFIED)

NFPA 72-2007 Changes

4.4.7.1.17.1 A trouble signal shall not be required for a circuit employed to produce a supplementary local alarm signal, provided that the occurrence of a short circuit on the circuit in no way affects the required operation of the fire alarm system.

(DELETED)

4.4.7.1.17.2 A trouble signal shall not be required for the circuit of an alarm notification appliance installed in the same room with the central control equipment, provided that the notification appliance circuit conductors are installed in conduit or are equivalently protected against mechanical injury.

(DELETED)

4.4.7.1.17.3 A trouble signal shall not be required for central station circuits serving notification appliances within a central station.

(DELETED)

4.4.7.2.1* Speaker Amplifier and Tone-Generating Equipment. If speakers are used to produce audible fire alarm signals, the required trouble signal for 4.4.7.2.1.1 through 4.4.7.2.1.3 shall be in accordance with 4.4.3.5.

(MODIFIED AND EXCEPTION LANGUAGE INCORPORATED INTO ARTICLE)

4.4.7.2.1.1 When primary power is available, failure of any audio amplifier shall result in a trouble signal.

(MODIFIED)

4.4.7.2.1.2 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.

(MODIFIED)

4.4.7.2.1.3 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.

(MODIFIED)

4.4.7.2.2 Two-Way Telephone Communications Circuits. Where a two-way telephone communications circuit is provided, its installation wires shall be monitored for open and short-circuit fault conditions that would cause the telephone communications circuit to become fully or partially inoperative. Two-way telephone communications circuit fault conditions shall result in a trouble signal in accordance with 4.4.3.5.

(MODIFIED)

NFPA 72-2007 Changes

4.4.7.3.1 Unless otherwise permitted or required by 4.4.7.3.1.1 through 4.4.7.3.1.4, all primary and secondary power supplies shall be monitored for the presence of voltage at the point of connection to the system. Failure of either supply shall result in a trouble signal in accordance with 4.4.3.5. Where the DACT is powered from a protected premises fire alarm system control unit, power failure indication shall be in accordance with this paragraph.

(MODIFIED)

4.4.7.3.3* Unless prohibited by the authority having jurisdiction, supervising station fire alarm systems shall be arranged to delay transmission of primary power failure signals for a period ranging from 60 to 180 minutes.

A.4.4.7.3.3 This requirement is intended to prevent all of the supervising station fire alarm systems in a given geographic area from transmitting simultaneous trouble signals (and overwhelming the associated supervising stations) in the event of a widespread power failure. A trouble signal is not intended to be transmitted if primary power is restored within the time delay.

(MODIFIED)

4.5.1.1* The authority having jurisdiction shall be notified prior to installation or alteration of equipment or wiring. At the authority having jurisdiction's request, complete information regarding the system or system alterations, including specifications, type of system or service, shop drawings, input/output matrix, battery calculations, and notification appliance circuit voltage drop calculations shall be submitted for approval.

A.4.5.1.1 Shop drawings for fire alarm systems are intended to provide basic information consistent with the objective of installing a fully operational, code-compliant fire alarm system and to provide the basis for the record drawings required elsewhere in this Code.

Approval of shop drawings is not intended to imply waiver or modification of any requirements of this Code or any other applicable criteria.

Shop drawings should include, to an extent commensurate with the extent of the work being performed, floor plan drawings, riser diagrams (except for systems in single-story buildings), control unit wiring diagrams, point-to-point wiring diagrams, and typical wiring diagrams as described herein.

All shop drawings should be drawn on sheets of uniform size and should include the following information:

- (1) Name of owner and occupant
- (2) Location, including street address
- (3) Device legend
- (4) Date
- (5) Input/output programming matrix

(ITEM #5 IS NEW)

NFPA 72-2007 Changes

A.4.5.1.1 (continued) Floor plan drawings should be drawn to an indicated scale and should include the following information:

- (1) Floor identification
- (2) Point of compass
- (3) Graphic scale
- (4) All walls and doors
- (5) All partitions extending to within 15 percent of the ceiling height
- (6) Room descriptions
- (7) Fire alarm device/component locations
- (8) Locations of fire alarm primary power connection(s)
- (9) Locations of monitor/control interfaces to other systems
- (10) Riser locations
- (11) Routing for Class A compliance, where applicable
- (12) Methods for compliance with 6.9.10.4 for survivability (emergency voice systems) as shown in Section 6.9, where applicable
- (13) Ceiling height and ceiling construction details

(ITEM #5 IS MODIFIED AND ITEMS 11, 12, & 13 ARE NEW)

Fire alarm system riser diagrams should include the following information:

- (1) General arrangement of the system, in building cross-section
- (2) Number of risers
- (3) Type and number of circuits in each riser
- (4) Type and number of fire alarm system components/devices on each circuit, on each floor or level

Control unit wiring diagrams should 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 and should include the following information:

- (1) Identification of the control equipment depicted
- (2) Location(s)
- (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, including the full text of all labels
- (6) All field connections to supervising station signaling equipment, releasing equipment, and fire safety control interfaces

Typical wiring diagrams should be provided for all initiating devices, notification appliances, remote alarm light emitting diodes (LEDs), remote test stations, and end-of-line and power supervisory devices.

(RE-WORDED WITH ADDITIONAL SUBMITTAL REQUIREMENTS)

FIGURE 4.5.2.1 Record of Completion.

(RE-ORGANIZED WITH AN EXAMPLE IN ANNEX A)

4.5.2.1.3 One copy of the record of completion, updated to reflect all system additions or modifications and maintained in a current condition at all times, shall be stored at the fire alarm control unit or other location approved by the authority having jurisdiction.

(MODIFIED AND ADDED "... SHALL BE STORED AT THE FACU ...")

4.7 Mass Notification Systems. See Annex E.
(NEW ANNEX)

Chapter 5 Initiating Devices

5.1.6 The interconnection of initiating devices with control equipment configurations and power supplies, or with output systems responding to external actuation, shall be as detailed elsewhere in this Code or in other NFPA codes and standards.

(MODIFIED)

5.4.2 Initiating devices shall not be installed in inaccessible areas.

(NEW)

5.4.3 Where subject to mechanical damage, an initiating device shall be protected. A mechanical guard used to protect a smoke, heat, or radiant energy-sensing detector shall be listed for use with the detector.

(RENUMBERED AND MODIFIED)

5.5.2.1.1 Where inaccessible areas do not contain combustible materials, they shall not be required to be protected by detectors.

(DELETED)

5.5.2.2* Partial or Selective Coverage. Where codes, standards, laws, or authorities having jurisdiction require the protection of selected areas only, the specified areas shall be protected in accordance with this Code.

A.5.5.2.2 If there are no detectors in the room or area of fire origin, the fire could exceed the design objectives before being detected by remotely located detectors. When coverage other than total coverage is required, partial coverage can be provided in common areas and work spaces such as corridors, lobbies, storage rooms, equipment rooms, and other tenantless spaces. The intent of selective coverage is to address a specific hazard only. Where a specific area is to be protected, all points within that area should be within $0.7 \times$ the adjusted detector spacing for spot-type detectors as required by 5.6.5 and 5.7.3.2. Note that an area does not necessarily mean an entire room. It is possible to provide properly spaced detectors to provide detection for only part of a room. Similarly, the Code permits protection of a specific hazard. In that case, detectors within a radius of $0.7 \times$ the adjusted detector spacing from the hazard provides the required detection. An example of protection of specific risk is the smoke detector required by 6.16.3 to be within 21 ft of an elevator, where elevator recall is required. It should also be noted that fire detection by itself is not fire protection. Also, protection goals could be such that detection being provided for a specific area or hazard might require a form of total coverage for that particular area or hazard. That is, it might be necessary to provide detectors above suspended ceilings or in small closets and other ancillary spaces that are a part of, or an exposure to, the area or hazard being protected.

(CONSOLIDATED PARTIAL AND SELECTIVE COVERAGE)

NFPA 72-2007 Changes

5.5.2.3* Nonrequired Coverage.

A.5.5.2.3 The requirement of 5.5.2.3 recognizes there will be instances where, for example, a facility owner would want to apply detection to meet certain performance goals and to address a particular hazard or need, but that detection is not required. Once installed, of course, acceptance testing, annual testing, and ongoing maintenance in accordance with this Code is expected. The intent of this section is to allow the use of a single detector, or multiple detectors provided for specific protection, with spacing to meet specific fire safety objectives as determined in accordance with 5.6.1.1 and 5.7.1.1.

(ANNEX MATERIAL MODIFIED)

5.5.2.3.1 Detection installed for reasons of achieving specific fire safety objectives, but not required by any laws, codes, or standards, shall meet all of the requirements of this Code, with the exception of prescriptive spacing criteria of 5.6.5 and 5.7.3.2.3.

(MODIFIED THE DEFINITION OF NONREQUIRED COVERAGE)

5.5.2.3.2 Where nonrequired detectors are installed for achieving specific fire safety objectives, additional detectors not necessary to achieve the objectives shall not be required.

(CLARIFIED THE VERBIAGE)

5.6 Heat-Sensing Fire Detectors.

Heat-sensing fire detectors shall be installed in all areas where required by other NFPA codes and standards or by the authority having jurisdiction.

(DELETED THE WORDS FOLLOWING “HEAT-SENSING FIRE DETECTORS”)

5.6.1.4* Spot-type heat detectors shall include in their installation instructions, technical data, and listing documentation the operating temperature and RTI (response time index) as determined by the organization listing the device. The requirement for RTI documentation shall have an effective date of July 1, 2008.

A.5.6.1.4 In order to predict the response of a heat detector using current fire modeling programs and currently published equations describing plume dynamics, two parameters must be known: operating temperature and response time index (RTI). The RTI is the quantification of the rate of heat transfer from the ceiling jet to the detector sensing element per unit of time, expressed as a function of ceiling jet temperature, ceiling jet velocity, and time.

(HEAT DETECTOR RTI REQUIREMENTS ARE BACK)

NFPA 72-2007 Changes

5.6.2.2* Integral Heat Sensors on Combination and Multi-Sensor Detectors. A heat-sensing detector integrally mounted on a smoke detector shall be listed for not less than 50 ft spacing.

A.5.6.2.2 The linear space rating is the maximum allowable distance between heat detectors. The linear space rating is also a measure of the heat detector response time to a standard test fire where tested at the same distance. The higher the rating, the faster the response time. This Code recognizes only those heat detectors with ratings of 15 m (50 ft) or more.

(REPLACED “SMOKE DETECTOR” WITH “COMBINATION AND MULTI-SENSOR”)

5.6.2.3 Marking. Heat-sensing fire detectors shall be marked with their listed operating temperature. Spot-type heat detectors shall also be marked with their RTI (response time index). The RTI marking requirements shall have an effective date of July 1, 2008.

(HEAT DETECTOR RTI REQUIREMENTS ARE BACK)

5.6.5.1.1 One of the following requirements shall apply:

- (1) The distance between detectors shall not exceed their listed spacing, and there shall be detectors within a distance of one-half the listed spacing, measured at right angles from all walls or partitions extending upward to within the top 15 percent of the ceiling height.

(REPLACED 18” WITH 15 PERCENT)

FIGURE A.5.6.5.1(g) Detector Spacing, Rectangular Areas.

(MODIFIED)

FIGURE A.5.6.5.4.1 Smoke or Heat Detector Spacing Layout, Sloped Ceilings (Peaked Type).

(MODIFIED)

5.6.5.5.1* On ceilings 3 m to 9.1 m (10 ft to 30 ft) high, heat detector linear spacing shall be reduced in accordance with Table 5.6.5.5.1 prior to any additional reductions for beams, joists, or slope, where applicable.

A.5.6.5.5.1 Both 5.6.5.5.1 and Table 5.6.5.5.1 are constructed to provide detector performance on higher ceilings [to 30 ft high] that is essentially equivalent to that which would exist with detectors on a 10 ft ceiling.

The Fire Detection Institute Fire Test Report (see *Annex G*) is used as a basis for Table 5.6.5.5.1. The report does not include data on integration-type detectors.

Pending development of such data, the manufacturer’s published instructions will provide guidance.

(ANNEX A MATERIAL ADDED)

5.6.3.2.3 Where a line-type detector is used in an application other than open area protection, the manufacturer’s published instructions shall be followed.

(REPLACED “INSTALLATION” WITH “PUBLISHED”)

NFPA 72-2007 Changes

5.7.1.8* Unless specifically designed and listed for the expected conditions, smoke detectors shall not be installed if any of the following ambient conditions exist:

- (1) Temperature below 32°F
- (2) Temperature above 100°F
- (3) Relative humidity above 93 percent
- (4) Air velocity greater than 300 ft/min

A.5.7.1.8 Product-listing standards include tests for temporary excursions beyond normal limits. In addition to temperature, humidity, and velocity variations, smoke detectors should operate reliably under such common environmental conditions as mechanical vibration, electrical interference, and other environmental influences. Tests for these conditions are also conducted by the testing laboratories in their listing program. In those cases in which environmental conditions approach the limits shown in Table A.5.7.1.8, the detector manufacturer's published instructions should be consulted for additional information and recommendations.

(ANNEX A MATERIAL MODIFIED)

FIGURE A.5.7.3.2.2 Mounting Installations Permitted (*top*) and Not Permitted (*bottom*).

(MODIFIED)

5.7.3.2.3.1* In the absence of specific performance-based design criteria, smoke detectors shall be permitted to be located using 30 ft spacing.

The text of 5.7.3.2.3.1 has been revised by a tentative interim amendment (TIA). See page 1.

A.5.7.3.2.3.1 The 30 ft spacing is a guide for prescriptive designs. The use of such a spacing is based upon customary practice in the fire alarm community.

(THE TIA IS INCLUDED IN THIS FINAL TEXT)

NFPA 72-2007 Changes

5.7.3.2.4.2 For level ceilings the following shall apply:

- (1) For ceilings with beam depths of less than 10 percent of the ceiling height ($0.1 H$), smooth ceiling spacing shall be permitted.
- (2) For ceilings with beam depths equal to or greater than 10 percent of the ceiling height ($0.1 H$) and beam spacing equal to or greater than 40 percent of the ceiling height ($0.4 H$), spot-type detectors shall be located on the ceiling in each beam pocket.
- (3)*For waffle or pan-type ceilings with beams or solid joists no greater than 24 in. deep and no greater than 12 ft center-to-center spacing, the following shall be permitted:
 - (a) Smooth ceiling spacing including those provisions permitted for irregular areas in 5.6.5.1.2, substituting “selected spacing” for “listed spacing”
 - (b) Location of spot-type smoke detectors on ceilings or bottom of beams

A.5.7.3.2.4.2(3) The geometry and reservoir effect is a significant factor that contributes to the development of velocity, temperature, and smoke obscuration conditions at smoke detectors located on the ceiling in beam pocket areas or at the bottom of beams as smoke collected in the reservoir volume spills into adjacent pockets. The waffle- or pan-type ceiling created by beams or solid joists, although retarding the initial flow of smoke, results in increased optical density, temperature rise, and gas velocities comparable to unconfined smooth ceilings.
- (4)*For corridors 15 ft in width or less having ceiling beams or solid joists perpendicular to the corridor length, the following shall be permitted:
 - (a) Smooth ceiling spacing including those provisions permitted for irregular areas in 5.6.5.1.2, substituting “selected spacing” for “listed spacing”
 - (b) Location of spot-type smoke detectors on ceilings, sidewalls, or the bottom of beams or solid joists

A.5.7.3.2.4.2(4) Corridor geometry is a significant factor that contributes to the development of velocity, temperature, and smoke obscuration conditions at smoke detectors located along a corridor. This is based on the fact that the ceiling jet is confined or constrained by the nearby walls without opportunity for entrainment of air. For corridors of approximately 15 ft in width and for fires of approximately 100 kW or greater, modeling has demonstrated that the performance of smoke detectors in corridors with beams has been shown to be comparable to spot smoke detector spacing on an unconfined smooth ceiling surface.
- (5) For rooms of 900 ft² area or less, only one smoke detector shall be required.

(MODIFIED SPACING ON HIGH-BEAMED AND DEEP-BEAM CEILINGS)

5.7.3.3.2 Maximum air sample transport time from the farthest sampling port to the detector shall not exceed 120 seconds.

(MODIFIED)

NFPA 72-2007 Changes

5.7.3.3.6* The sampling ports and in-line filter, if used, shall be kept clear in accordance with the manufacturer's published instructions.

A.5.7.3.3.6 The air sampling-type detector system should be able to withstand dusty environments by either air filtering or electronic discrimination of particle size. The detector should be capable of providing optimal time delays of alarm outputs to eliminate nuisance alarms due to transient smoke conditions. The detector should also provide facilities for the connection of monitoring equipment for the recording of background smoke level information necessary in setting alert and alarm levels and delays.

(ADDED ANNEX A MATERIAL)

5.7.3.4.1 Projected beam-type smoke detectors shall be located in accordance with the manufacturer's published instructions.

(REPLACED "INSTALLATION" WITH "PUBLISHED")

5.7.3.4.4 If mirrors are used with projected beams, the mirrors shall be installed in accordance with the manufacturer's published instructions.

(REPLACED "INSTALLATION" WITH "PUBLISHED")

5.7.3.8* Partitions. Where partitions extend to within 15 percent of the ceiling height, the spaces separated by the partitions shall be considered as separate rooms.

A.5.7.3.8 This requirement is based on the generally accepted principle that the ceiling jet is approximately 10 percent of the distance from the base of the fire to the ceiling. To this figure, an additional safety factor of 50 percent has been added. Performance-based methods are available to predict the impact of partitions on the flow of smoke to detectors and can be used to substantiate a less restrictive design criterion.

(IMPROVED GRAMMAR AND ADDED ANNEX A MATERIAL)

5.7.5.1.1 Combination and multi-sensor smoke detectors that have a fixed-temperature element as part of the unit shall be selected in accordance with Table 5.6.2.1.1 for the maximum ceiling temperature expected in service.

(MODIFIED)

NFPA 72-2007 Changes

5.7.5.2* High-Rack Storage. The location and spacing of smoke detectors for high-rack storage shall address the commodity, quantity, and configuration of the rack storage.

A.5.7.5.2 For the most effective detection of fire in high-rack storage areas, detectors should be located on the ceiling above each aisle and at intermediate levels in the racks. This is necessary to detect smoke that is trapped in the racks at an early stage of fire development when insufficient thermal energy is released to carry the smoke to the ceiling. Earliest detection of smoke is achieved by locating the intermediate level detectors adjacent to alternate pallet sections as shown in Figure A.5.7.5.2(a) and Figure A.5.7.5.2(b). The detector manufacturer's published instructions and engineering judgment should be followed for specific installations. A projected beam-type detector can be permitted to be used in lieu of a single row of individual spot-type smoke detectors.

Sampling ports of an air sampling-type detector can be permitted to be located above each aisle to provide coverage that is equivalent to the location of spot-type detectors. The manufacturer's published instructions and engineering judgment should be followed for the specific installation.

(MOVED PRESCRIPTIVE LANGUAGE TO ANNEX A)

5.7.5.3.3* Spacing. Smoke detector spacing shall be in accordance with Table 5.7.5.3.3 and Figure 5.7.5.3.3.

Exception: Air-sampling or projected beam smoke detectors installed in accordance with the manufacturer's published instructions.

A.5.7.5.3.3 Smoke detector spacing depends on the movement of air within the room.

(REPLACED "INSTALLATION" WITH "PUBLISHED")

NFPA 72-2007 Changes

5.7.6 Video Image Smoke Detection.

5.7.6.1 Video image smoke detection systems and all of the components thereof, including hardware and software, shall be listed for the purpose of smoke detection.

5.7.6.2 Video image smoke detection systems shall comply with all of the applicable requirements of Chapters 1, 4, 5, 6, and 10 of this Code.

5.7.6.2.1 Systems shall be designed in accordance with the performance-based design requirements of Section 5.3.

5.7.6.2.2 The location and spacing of video image smoke detectors shall comply with the requirements of 5.10.5.

5.7.6.3* Video signals generated by cameras that are components of video image smoke detection systems shall be permitted to be transmitted to other systems for other uses only through output connections provided specifically for that purpose by the video system manufacturer.

A.5.7.6.3 Facility owners and managers might desire to use cameras and their images for purposes other than smoke detection. The intent of this paragraph is not to prohibit additional uses, but to ensure the integrity of the life safety smoke detection mission of the equipment.

5.7.6.4* All component controls and software shall be protected from unauthorized changes. All changes to the software or component settings shall be tested in accordance with Chapter 10.

A.5.7.6.4 Video image smoke detection control and software should be protected from tampering by passwords, software keys, or other means of limiting access to authorized/qualified personnel. Component settings include any control or programming that might affect the operation of coverage of the detection. This includes, but is not limited to, camera focus, field of view, motion sensitivity settings, and change of camera position.

(NEW)

5.8.1.1 The radiant energy detection design documentation shall state the required performance objective of the system.

(NEW)

5.8.5 Video Image Flame Detection.

5.8.5.1 Video image flame detection systems and all of the components thereof, including hardware and software, shall be listed for the purpose of flame detection.

5.8.5.2 Video image flame detection systems shall comply with all of the applicable requirements of Chapters 1, 4, 5, 6, and 10 of this Code.

(NEW)

NFPA 72-2007 Changes

5.8.5.3* Video signals generated by cameras that are components of video image flame detection systems shall be permitted to be transmitted to other systems for other uses only through output connections provided specifically for that purpose by the video system manufacturer.

A.5.8.5.3 Facility owners and managers might desire to use cameras and their images for purposes other than flame detection. The intent of this paragraph is not to prohibit additional uses, but to ensure the integrity of the life safety flame detection mission of the equipment.

(NEW)

5.8.5.4* All component controls and software shall be protected from unauthorized changes. All changes to the software or component settings shall be tested in accordance with Chapter 10.

A.5.8.5.4 Video image flame detection control and software should be protected from tampering by passwords, software keys, or other means of limiting access to authorized/qualified personnel. Component settings include any control or programming that might affect the operation of coverage of the detection. This includes, but is not limited to, camera focus, field of view, motion sensitivity settings, and change of camera position.

(NEW)

5.9 Combination, Multi-Criteria, and Multi-Sensor Detectors.

5.9.1 General. Section 5.9 provides requirements for the selection, location, and spacing of combination, multi-criteria, and multi-sensor detectors.

(NEW)

5.9.2 Combination Detectors.

5.9.2.1 A combination detector shall be listed for each sensor.

5.9.2.2 The device listings shall determine the locations and spacing criteria in accordance with Chapter 5.

(NEW)

5.9.3 Multi-Criteria Detectors.

5.9.3.1 A multi-criteria detector shall be listed for the primary function of the device.

5.9.3.2 Because of the device-specific, software-driven solution of multi-criteria detectors to reduce unwanted alarms and improve detector response to a nonspecific fire source, location and spacing criteria included with the detector installation instructions shall be followed.

(NEW)

5.9.4 Multi-Sensor Detectors.

5.9.4.1 A multi-sensor detector shall be listed for each sensor.

5.9.4.2 Because of the device-specific, software-driven solution of multi-sensor detectors to reduce unwanted alarms and improve detector response to a

NFPA 72-2007 Changes

nonspecific fire source, location and spacing criteria included with the detector installation instructions shall be followed.

(NEW)

5.10.5.1 The location and spacing of detectors shall be based on the principle of operation and an engineering survey of the conditions anticipated in service. The manufacturer's published instructions shall be consulted for recommended detector uses and locations.

(MODIFIED)

5.11.2* Activation of the initiating device shall occur within 90 seconds of waterflow at the alarm-initiating device when flow occurs that is equal to or greater than that from a single sprinkler of the smallest orifice size installed in the system.

(MODIFIED)

5.13.5* Manual fire alarm boxes shall be installed so that they are conspicuous, unobstructed, and accessible.

(MODIFIED)

5.14 Fire Extinguisher Monitoring Device.

A fire extinguisher monitoring device shall indicate those conditions for a specific fire extinguisher required by NFPA 10, *Standard for Portable Fire Extinguishers*, to a fire alarm control unit or other control unit.

(NEW)

FIGURE A.5.14.5.2(b) Typical Duct Detector Placement.

(DELETED THE "6 TO 10 DUCT WIDTHS DOWNSTREAM" SUGGESTION)

5.16* Smoke Detectors for Control of Smoke Spread.

5.16.1* Classifications. Smoke detectors installed and used to prevent smoke spread by initiating control of fans, dampers, doors, and other equipment shall be classified in the following manner:

- (1) Area detectors that are installed in the related smoke compartments
- (2) Detectors that are installed in the air duct systems
- (3) Video image smoke detection that is installed in related smoke compartments

(ITEM #3 IS NEW)

5.16.1* Classifications. Smoke detectors installed and used to prevent smoke spread by initiating control of fans, dampers, doors, and other equipment shall be classified in the following manner:

- (1) Area detectors that are installed in the related smoke compartments
- (2) Detectors that are installed in the air duct systems
- (3) Video image smoke detection that is installed in related smoke compartments

A.5.16.1 Smoke detectors located in an open area(s) should be used rather than duct-type detectors because of the dilution effect in air ducts. Active smoke management systems installed in accordance with NFPA 92A, *Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences*, or NFPA 92B, *Standard for Smoke Management Systems in Malls, Atria, and Large Spaces*, should be controlled by total coverage open area detection.

(ITEM #3 IS NEW)

5.16.5.2* Air duct detectors shall be installed in such a way as to obtain a representative sample of the airstream. This installation shall be permitted to be achieved by any of the following methods:

- (1) Rigid mounting within the duct
- (2) Rigid mounting to the wall of the duct with the sensing element protruding into the duct
- (3) Installation outside the duct with rigidly mounted sampling tubes protruding into the duct
- (4) Installation through the duct with projected light beam

A.5.16.5.2 Where duct detectors are used to initiate the operation of smoke dampers, they should be located so that the detector is between the last inlet or outlet upstream of the damper and the first inlet or outlet downstream of the damper. In order to obtain a representative sample, stratification and dead air space should be avoided. Such conditions could be caused by return duct openings, sharp turns, or connections, as well as by long, uninterrupted straight runs. In return air systems, the requirements of 5.16.4.2.2 take precedence over these considerations. [See *Figure A.5.16.5.2(a)* and *Figure A.5.16.5.2(b)*.]

Usually, it is necessary to manage smoke flow in buildings. Duct smoke detectors are used to shut down HVAC systems or initiate smoke management.

Filters have a serious effect on the performance of duct smoke detectors. The location of the detector relative to the filter and the source of smoke must be considered during the design process. Where smoke detectors are installed downstream from filters, they should be deemed to serve the purpose of providing an alarm indication of the occurrence of a fire in the HVAC unit (filters, belts, heat exchangers, etc.). These detectors usually serve the purpose of protecting building occupants from the smoke produced by an HVAC unit fire, or smoke ingress via the fresh air intake for the unit. They cannot be expected to serve the purpose of providing detection for the return side of the system.

Where return side detection is required, that requirement should be fulfilled with separate detectors from those monitoring the supply side. In order to be effective, return air duct smoke detectors should be located such that there are no filters between them and the source of the smoke.

NFPA 72-2007 Changes

Sampling tubes should be oriented to overcome thermal stratification due to buoyancy of the smoke in the upper half of the duct. This condition occurs where duct velocities are low, buoyancy exceeds flow inertia, or the detector is installed close to the fire compartment. A vertical orientation of sampling tubes overcomes the effects of differential buoyancy. Where a detector is installed on a duct serving a single fire compartment, where the buoyancy exceeds the flow inertia of the air in the duct and the sampling tube cannot be oriented vertically, then the effects of thermal stratification can be minimized by locating the detector sampling tube in the upper half of the duct. The thermal stratification is not a concern where the detector is installed far from the fire compartment or where the smoke is at or close to the average temperature in the duct.

(MODIFIED ANNEX A LANGUAGE)

5.16.5.3 Detectors shall be mounted in accordance with the manufacturer's published instructions and shall be accessible for cleaning by providing access doors or control units in accordance with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

(MODIFIED)

5.16.6.5.1.1 If the depth of wall section above the door is 24 in. or less, one ceiling-mounted smoke detector shall be required on one side of the doorway only, or two wall-mounted detectors shall be required, one on each side of the doorway. Figure 5.16.6.5.1.1, part A or B, shall apply.

(MODIFIED)

FIGURE 5.16.6.5.1.1 Detector Location Requirements for Wall Sections.

(MODIFIED)

5.16.6.5.1.2 If the depth of wall section above the door is greater than 24 in. on one side only, one ceiling-mounted smoke detector shall be required on the higher side of the doorway only, or one wall-mounted detector shall be required on both sides of the doorway. Figure 5.16.6.5.1.1, part D, shall apply.

(MODIFIED)

5.16.6.5.1.4 If a detector is specifically listed for door frame mounting or if a listed combination or integral detector-door closer assembly is used, only one detector shall be required if installed in the manner recommended by the manufacturer's published instructions. Figure 5.16.6.5.1.1, parts A, C, and E, shall apply.

(MODIFIED)

5.17 Mass Notification Systems. See Annex E.

(NEW)

Chapter 6 Protected Premises Fire Alarm Systems

6.1.1* The application, installation, and performance of fire alarm systems within protected premises, including fire alarm and supervisory signals, shall comply with the requirements of this chapter.

A.6.1.1 It is intended that fire alarm systems and their components used for mass notification applications be covered by Chapter 6.

(ADDED ANNEX A MATERIAL REGARDING MASS NOFIFICATION)

6.2.1* Purpose. The systems covered in Chapter 6 shall be for the protection of life or property, or both, by indicating the existence of heat, fire, smoke, or other emergencies impacting the protected premises.

A.6.2.1 Systems can be installed for the purposes of life safety, property protection, or both. Evacuation or relocation is not a required output action for every system installed in accordance with Chapter 6.

(ADDED "...OR OTHER EMERGENCIES...)

6.2.3* Nonrequired (Voluntary) Systems and Components.

A.6.2.3 Nonrequired fire alarm features are defined in 3.3.111. These are fire alarm systems or components that are not required by the building or fire codes and are installed voluntarily by a building owner to meet site-specific fire safety objectives. There is a need to properly document the nonrequired system and components. Nonrequired components must be operationally compatible in harmony with other required components and shall not be detrimental to the overall system performance. It is for this reason that 6.2.3.1 mandates that nonrequired (voluntary) systems and components meet the applicable installation, testing, and maintenance requirements of this Code. It is not the intent of the Code to have the installation of nonrequired (voluntary) systems or components trigger a requirement for the installation of additional fire alarm components or features in the building. For example, if a building owner voluntarily installs a fire alarm control unit to transmit sprinkler waterflow signals to a central station, that does not trigger a requirement to install other fire alarm system components or features, such as manual fire alarm boxes, occupant notification, or electronic supervision of sprinkler control valves. See also A.5.5.2.3 and A.7.1.5.

Alternatively, supervision and power requirements are required to be taken into account for the nonrequired components/systems on the required fire alarm systems.

6.2.3.1 Nonrequired protected premises systems and components shall meet the requirements of this Code.

6.2.3.2 Nonrequired systems and components shall be identified on the record drawings required in 4.5.2.3(2).

(ADDED "...AND COMPONENTS..." AND ADDED ANNEX A MATERIAL)

6.3 System Features.

The features required for a protected premises fire alarm system shall be documented as a part of the system design and shall be determined in accordance with 6.3.1 through 6.3.3.

(NEW)

6.3.1 Required Systems. Features for required systems shall be based on the requirements of other applicable codes or statutes that have been adopted by the enforcing jurisdiction.

(NEW)

6.3.2 Nonrequired Systems. The features for a nonrequired system shall be established by the system designer on the basis of the goals and objectives intended by the system owner.

(NEW)

6.3.3 Required Features.

6.3.3.1 Building Fire Alarm Systems. Protected premises fire alarm systems that serve the general fire alarm needs of a building or buildings shall include one or more of the following systems or functions:

- (1) Manual alarm signal initiation
- (2) Automatic alarm signal initiation
- (3) Monitoring of abnormal conditions in fire suppression systems
- (4) Activation of fire suppression systems
- (5) Activation of fire safety functions
- (6) Activation of alarm notification appliances
- (7) Emergency voice/alarm communications
- (8) Guard's tour supervisory service
- (9) Process monitoring supervisory systems
- (10) Activation of off-premises signals
- (11) Combination systems
- (12) Integrated systems

(MODIFIED)

6.3.3.2* Dedicated Function Fire Alarm Systems.

A.6.3.3.2 Examples of dedicated function fire alarm systems would include an elevator recall control and supervisory control unit, as addressed in [6.16.3.2](#), or a system used specifically to monitor sprinkler waterflow and supervisory functions.

(NEW)

6.3.3.2.1 In facilities without a building fire alarm system, a dedicated function fire alarm system shall be permitted and shall not be required to include other functions or features of a building fire alarm system.

(NEW)

6.3.3.2.2 Where a dedicated function fire alarm system exists and a building fire alarm system is subsequently installed, the systems shall be interconnected and comply with 6.8.2.

(NEW)

NFPA 72-2007 Changes

6.4 System Performance and Integrity.

6.4.1 Purpose. Section 6.4 provides information that shall be used in the design and installation of protected premises fire alarm and mass notification systems for the protection of life and property.

(ADDED REFERENCE TO MASS NOTIFICATION)

6.4.2* Circuit Designations. Initiating device circuits, notification appliance circuits, and signaling line circuits shall be designated by class or style, or both, depending on the circuit's capability to continue to operate during specified fault conditions.

A.6.4.2 Class A circuits are considered to be more reliable than Class B circuits because they remain fully operational during the occurrence of a single open or a single ground fault, while Class B circuits remain operational only up to the location of an open fault. However, neither Class A nor Class B circuits remain operational during a wire-to-wire short.

For both Class A and Class B initiating device circuits, a wire-to-wire short is permitted to cause an alarm on the system based on the rationale that a wire-to-wire short is the result of a double fault (e.g., both circuit conductors have become grounded), while the Code only considers the consequences of single faults.

Limitation to Class A and Class B circuits only poses a more serious problem for signaling line circuits. Though a Class A signaling line circuit remains fully operational during the occurrence of a single open or single ground fault, a wire-to-wire short disables the entire circuit. The risk of such a catastrophic failure is unacceptable to many system designers, users, and authorities having jurisdiction. Using the style designation makes it possible to specify either full system operation during a wire-to-wire short (Style 7), or system degradation during a wire-to-wire short (Style 6), or a level of performance in between that of a Style 7 and a minimum function Class A circuit (Style 2).

(ANNEX A MATERIAL MODIFIED)

6.4.2.1 Class.

6.4.2.1.1 (2) Initiating device circuits and signaling line circuits that do not transmit an alarm or supervisory signal, or notification appliance circuits that do not allow connected devices to operate beyond the location of a single open on any circuit conductor, shall be designated as Class B.

(ADDED "...OR A NONSIMULTANEOUS SINGLE GROUND FAULT...")

6.4.2.2 Style.

6.4.2.2.1 In addition to the requirements shown for Class A or Class B, signaling line circuits shall be permitted to be designated as either Style 4, 6, or 7, depending on their ability to meet the alarm and trouble performance requirements shown in Table 6.6.1, during a single open, single ground, wire-to-wire short, simultaneous wire-to-wire short and open, simultaneous wire-to-wire short and ground, and simultaneous open and ground.

(REMOVED ALL STYLES FOR INITIATING DEVICE CIRCUITS, REMOVED ALL STYLES FOR NOTIFICATION APPLIANCE CIRCUITS AND REMOVED ALL BUT THREE STYLES FOR SIGNALING LINE CIRCUITS)

NFPA 72-2007 Changes

6.4.2.2.3 Where the power to a device is supplied over a separate circuit from the signaling line circuit or initiating device circuit, the operation of the power circuit shall meet the performance requirements of the initiating device circuit or signaling line circuit.

(NEW)

6.5* Performance of Initiating Device Circuits (IDCs).

The assignment of class designations to initiating device circuits shall be based on their performance capabilities under abnormal (fault) conditions in accordance with the requirements of Table 6.5.

(REMOVED REFERENCE TO STYLE DESIGNATIONS)

Table 6.5 Performance of Initiating Device Circuits (IDCs)

(STYLES REMOVED)

Table 6.6.1 Performance of Signaling Line Circuits (SLCs)

(REMOVED ALL STYLES BUT 4, 5, AND 7)

6.7 Performance of Notification Appliance Circuits (NACs).

The assignment of class designations to notification appliance circuits shall be based on their performance capabilities under abnormal (fault) conditions in accordance with the requirements of Table 6.7.

(STYLES REMOVED)

Table 6.7 Notification Appliance Circuits (NACs)

(STYLES REMOVED)

6.8.1.3.1.1 The signal from an automatic fire detection device selected for positive alarm sequence operation shall be acknowledged at the fire alarm control unit by trained personnel within 15 seconds of annunciation in order to initiate the alarm investigation phase. If the signal is not acknowledged within 15 seconds, notification signals in accordance with the building evacuation or relocation plan and remote signals shall be automatically and immediately activated.

(REMOVED "..FIRE ALARM...")

NFPA 72-2007 Changes

6.8.2.1 Fire alarm systems shall be permitted to be either integrated systems combining all detection, notification, and auxiliary functions in a single system or a combination of component subsystems. Fire alarm system components shall be permitted to share control equipment or shall be able to operate as stand-alone subsystems, but, in any case, they shall be arranged to function as a single system.

Exception: Where the building is not served by a building fire alarm system, independent dedicated function fire alarm systems and/or releasing fire alarm systems shall not be required to be interconnected to function as a single system.

The text of 6.8.2.1 has been revised by a tentative interim amendment (TIA). See page 1.

(ADDED EXCEPTION LANGUAGE)

6.8.2.3 The method of interconnection of fire alarm control units shall meet the monitoring requirements of 4.4.7 and NFPA 70, National Electrical Code, Article 760, and shall be achieved by the following recognized means:

- (1) Electrical contacts listed for the connected load
- (2) Data communications over signaling line circuit(s) dedicated to the fire alarm or shared with other premises operating systems
- (3) Other listed methods

(ADDED "...FIRE ALARM...")

6.8.2.5 Each interconnected fire alarm control unit shall be separately monitored for alarm, supervisory, and trouble conditions.

(ADDED "...FIRE ALARM...")

6.8.2.6 Interconnected fire alarm control unit alarm signals shall be permitted to be monitored by zone or by combined common signals.

(ADDED "...FIRE ALARM...")

6.8.2.7 Protected premises fire alarm control units shall be capable of being reset or silenced only from the fire alarm control unit at the protected premises unless otherwise permitted by 6.8.2.8.

(ADDED "...FIRE ALARM...")

6.8.4.2 Operation of non-fire system function(s) originating within a connected non-fire system shall not interfere with the required operation of the fire alarm system unless otherwise permitted by this Code.

(NEW)

NFPA 72-2007 Changes

6.8.4.3* Short circuits, open circuits, or grounds in this equipment or between this equipment and the fire alarm system wiring shall not interfere with the monitoring for integrity of the fire alarm system or prevent alarm, supervisory, or fire safety control signal transmissions.

A.6.8.4.3 When a non-fire system is combined with the fire alarm system using a data transmission method such as EIA232 serial data, isolation of the interconnect circuitry is essential to proper operation. Methods for isolating the non-fire alarm system may include isolation wiring methods or a barrier to prevent failure of the fire alarm system functions due to transfer of wiring faults between the systems. It is also important to consider the adverse impact on the fire alarm system caused by excessive traffic on the communications link.

(ADDED ANNEX A MATERIAL)

6.8.4.4 All non–fire alarm components of a combination system shall be listed for fire alarm use unless removal, replacement, failure, or maintenance procedure on any non–fire alarm hardware, software, or circuits does not impair the required operation of the fire alarm system.

(RE-WORDED TO REMOVE THE EXCEPTION LANGUAGE)

NFPA 72-2007 Changes

6.8.4.5* Speakers used as alarm notification appliances on fire alarm systems shall also be permitted to be used for non-emergency purposes, provided that condition (1) or (2) is met:

- (1) The fire command center is constantly attended by trained personnel and selective paging is permitted by the authority having jurisdiction.
- (2) All of the following conditions are met:
 - (a) The speakers and associated audio equipment are installed or located with safeguards to resist tampering or misadjustment of those components essential for intended emergency notification.
 - (b) The monitoring integrity requirements of 4.4.7 and 6.9.8 shall continue to be met while the system is used for non-emergency purposes.
 - (c) It is permitted by the local authority having jurisdiction.

A.6.8.4.5 If the building paging system can be controlled by personnel at the fire command center, and if permitted by the authority having jurisdiction, the building paging system can be used as a supplementary notification system to provide selective and all-call fire alarm evacuation voice messages and messages for occupants to relocate to safe areas in a building.

Dedicated fire alarm/voice evacuation alarm systems are not required to monitor the integrity of the speaker circuits while active for emergency purposes.

These circuits must be monitored for integrity while active for nonemergency purposes. The building operator, system designer, and authority having jurisdiction should be aware that in some situations such a system could be subject to deliberate tampering. Tampering is usually attempted to reduce the output of a sound system that is in constant use as a music or paging system and is a source of annoyance to employees. The likelihood of tampering can be reduced through proper consideration of loudspeaker accessibility and system operation. Access can be reduced through the use of hidden or nonadjustable transformer taps (which can reduce playback levels), use of vandal-resistant listed loudspeakers, and placement in areas that are difficult to access, such as high ceilings (any ceiling higher than could be reached by standing on a desk or chair). Nonemergency operation of the system should always consider that an audio system that annoys an employee potentially reduces employee productivity and can also annoy the public in a commercial environment. Most motivations for tampering can be eliminated through appropriate use of the system and employee discipline. Access to amplification equipment and controls should be limited to those in authority to make adjustments to such equipment. It is common practice to install such equipment in a manner that allows adjustment of nonemergency audio signal levels while defaulting to a fixed, preset level of playback when operating in emergency mode. Under extreme circumstances, certain zones of a protected area might require a dedicated emergency voice/alarm communications zone.

(RE-WORDED TO REMOVE THE EXCEPTION LANGUAGE AND CHANGED ANNEX A)

6.8.4.6 Speakers used as alarm notification appliances on fire alarm systems shall also be permitted to be used for mass notification systems.

(NEW)

NFPA 72-2007 Changes

6.8.4.7* In combination systems, fire alarm signals shall be distinctive, clearly recognizable, and, with the exception of mass notification inputs, take precedence over any other signal even when a non-fire alarm signal is initiated first and shall be indicated as follows in descending order of priority unless otherwise permitted by this Code:

- (1) Signals associated with life safety
- (2) Signals associated with property protection
- (3) Trouble signals associated with life and/or property protection
- (4) All other signals

A.6.8.4.7 Examples of signal classification are provided in Table A.6.8.4.7. This is not all-inclusive or prescriptive but is meant to illustrate a potential classification scheme. Actual schemes may vary depending upon the response plan and/or requirements of the authority having jurisdiction. Mass notification systems are allowed to take priority over the fire alarm audible notification message or signal. This is intended to allow the mass notification system to prioritize emergency signals on the basis of risk to building occupants. The designer should specify the desired operation, in particular, as to what should occur immediately after the mass notification message has completed.

(NEW)

Table A.6.8.4.7 Examples of Signal Classification

(NEW)

6.8.4.8 If the authority having jurisdiction determines that the information being displayed or annunciated on a combination system is excessive and is causing confusion and delayed response to a fire emergency, the authority having jurisdiction shall be permitted to require that the display or annunciation of information for the fire alarm system be separate from, and have priority in accordance with 6.8.4.7, over information for the non-fire alarm systems.

(ADDED "...IN ACCORDANCE WITH 6.8.4.7...")

6.8.4.9* Live voice instructions originating from the protected premises fire or mass notification systems shall override all previously initiated signals and shall have priority over both of the following:

- (1) Any subsequent automatically initiated signals on that channel
- (2) Remotely generated mass notification messages

A.6.8.4.9 When interfacing fire alarm and mass notification functions, the system designer should evaluate the proximity of the individual operating locations (controls/microphone). This requirement applies where mass notification systems are installed in buildings that do not have emergency voice alarm systems (in accordance with 6.9.1); otherwise, the provisions of 6.9.6.7 apply.

(NEW)

NFPA 72-2007 Changes

6.8.4.10* Signals from carbon monoxide detectors and carbon monoxide detection systems transmitted to a fire alarm system shall be permitted to be supervisory signals.

A.6.8.4.10 See NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units*, for more information.

(NEW)

6.8.4.11* Fire Extinguisher Monitoring Devices and Systems. Signals from a fire extinguisher monitoring device or fire extinguisher monitoring system transmitted to a fire alarm system shall be permitted to be supervisory signals.

A.6.8.4.11 See NFPA 10, *Standard for Portable Fire Extinguishers*, for more information on portable fire extinguishers.

(NEW)

6.8.5.1.1 All initiating devices shall be installed in accordance with Chapter 5 and tested in accordance with Chapter 10.

(REMOVED "...LISTED FOR THEIR INTENDED APPLICATION...")

6.8.5.1.2* For fire alarm systems employing automatic fire detectors or waterflow detection devices, at least one fire alarm box shall be provided to initiate a fire alarm signal. This fire alarm box shall be located where required by the authority having jurisdiction.

Exception: Fire alarm systems dedicated to elevator recall control and supervisory service as permitted in 6.16.3.

A.6.8.5.1.2 The manual fire alarm box required by 6.8.5.1.2 is intended to provide a means to manually activate the fire alarm system when the automatic fire detection system or waterflow devices are out of service due to maintenance or testing, or where human discovery of the fire precedes automatic sprinkler system or automatic detection system activation. Where the fire alarm system is connected to a monitoring facility, the manual fire alarm box required by 6.8.5.1.2 should be connected to a separate circuit that is not placed "on test" when the detection or sprinkler system is placed "on test." The manual fire alarm box should be located in an area that is accessible to occupants of the building and should not be locked.

(NEW ANNEX A MATERIAL)

6.8.5.3 Alarm Signal Initiation — Initiating Devices with Separate Power and Signaling Wiring.

6.8.5.3.1 Automatic fire alarm signal initiating devices that have integral trouble signal contacts shall be connected to the initiating device circuit so that a trouble condition within a device does not impair alarm transmission from any other initiating device.

(RE-WORDED)

NFPA 72-2007 Changes

6.8.5.3.2* Automatic fire alarm signal-initiating devices that use a nonintegral device to monitor the integrity of the power supply wiring to the individual initiating devices shall have the nonintegral device connected to the initiating device circuit so that a fault on the power supply wiring does not impair alarm transmission from any operational initiating device.

A.6.8.5.3.2 Where power is supplied separately to the individual initiating device(s), multiple initiating circuits are not prohibited from being monitored for integrity by a single power supervision device.

(NEW)

6.8.5.4.2 If automatic drift compensation of sensitivity for a fire detector is provided, the fire alarm control unit shall identify the affected detector when the limit of compensation is reached.

(RE-WORDED)

6.8.5.5* Alarm Signal Initiation — Sprinkler Systems.

A.6.8.5.5 This Code does not specifically require a waterflow alarm-initiating device to be connected to the building fire alarm system. Connection to the building fire alarm system would be determined by the requirements established by the authority having jurisdiction. See A.1.2.4.

(NEW)

6.8.5.5.1 Where required to be electronically monitored, waterflow alarm-initiating devices shall be connected to a dedicated function fire alarm control unit designated as "sprinkler waterflow and supervisory system," and permanently identified on the control unit and record drawings.

Exception: Where waterflow alarm-initiating devices are connected to a building fire alarm system, a dedicated function fire alarm control unit shall not be required.

(RE-WORDED ENTIRELY TO ACCOMMODATE THE USE OF A STAND-ALONE DACT)

6.8.5.5.2* The number of waterflow alarm-initiating devices permitted to be connected to a single initiating device circuit shall not exceed five.

A.6.8.5.5.2 Circuits connected to a signaling line circuit interface are initiating device circuits and are subject to these limitations.

(REMOVED "...ALARM-INITIATING DEVICES..." AND ADDED ANNEX A MATERIAL)

NFPA 72-2007 Changes

6.8.5.6* Supervisory Signal Initiation — Sprinkler Systems.

6.8.5.6.1 Where required to be electronically monitored, supervisory signal-initiating devices shall be connected to a dedicated function fire alarm control unit designated as "sprinkler waterflow and supervisory system," and permanently identified on the control unit and record drawings.

Exception: Where supervisory signal-initiating devices are connected to a building fire alarm system, a dedicated function fire alarm control unit shall not be required.

A.6.8.5.6 This Code does not specifically require supervisory signal-initiating devices to be connected to the building fire alarm system. Connections to the building fire alarm system would be determined by the requirements established by the authority having jurisdiction. See A.1.2.4. Some systems utilize non-electrical methods to supervise conditions of the system such as chains on sprinkler control valves.

Supervisory signals are not intended to provide indication of design, installation, or functional defects in the supervised systems or system components and are not a substitute for regular testing of those systems in accordance with the applicable standard. Supervised conditions should include, but not be limited to, the following:

- (1) Control valves 1 ½ in. or larger
- (2) Pressure, including dry-pipe system air, pressure tank air, preaction system supervisory air, steam for flooding systems, and public water
- (3) Water tanks, including water level and temperature
- (4) Building temperature, including areas such as valve closet and fire pump house
- (5) Electric fire pumps, including running (alarm or supervisory), power failure, and phase reversal
- (6) Engine-driven fire pumps, including running (alarm or supervisory), failure to start, controller off "automatic," and trouble (e.g., low oil, high temperature, overspeed)
- (7) Steam turbine fire pumps, including running (alarm or supervisory), steam pressure, and steam control valves

(RE-WORDED TO ACCOMMODATE THE USE OF A STAND-ALONE DACT)

6.8.5.6.2* The number of supervisory signal-initiating devices permitted to be connected to a single initiating device circuit shall not exceed 20.

A.6.8.5.6.2 Circuits connected to a signaling line circuit interface are initiating device circuits and are subject to these limitations.

(REMOVED "...ALARM-INITIATING DEVICES..." AND ADDED ANNEX A LANGUAGE)

6.8.5.11.1 *Exception No. 2: Tamper resistant screws or other approved mechanical means shall be permitted for preventing access to junction boxes and device covers installed outside of buildings.*

(“TAMPER RESISTANT” REPLACES “TAMPERPROOF”)

6.8.6 Fire Alarm and Mass Notification System Notification Outputs.

(ADDED “MASS NOTIFICATION SYSTEM NOTIFICATION”)

NFPA 72-2007 Changes

6.8.6.2* Notification Appliances in Exit Stair Enclosures, Exit Passageways, and Elevator Cars. Notification appliances shall not be required in exit stair enclosures, exit passageways, and elevator cars in accordance with 6.8.6.2.1 through 6.8.6.2.4.

A.6.8.6.2 The general purpose of the fire alarm audible and visual notification appliances is to alert occupants that there is a fire condition and for occupants to exit from the building. Once the occupants are in the exit enclosures, high noise levels and light intensity from notification appliances may cause confusion and impede egress. There may be conditions that warrant the installation of notification appliances in exit enclosures, but careful analysis is necessary to avoid impeding exiting from the building.

(MATERIAL ADDED TO ANNEX A TO CLARIFY THE PURPOSE OF NOTIFICATION APPLIANCES IN STAIRWELLS)

6.9* Emergency Voice/Alarm Communications.

A.6.8.6.5.1 Paragraph 4.4.3.6 requires that fire alarm signals be distinctive in sound from other signals and that this sound not be used for any other purpose. The use of the distinctive three-pulse temporal pattern fire alarm evacuation signal required by 6.8.6.5.1 became effective July 1, 1996, for new systems installed after that date. It is not the intent that the ANSI S3.41 requirements for sound pressure levels or the distinct pattern for visible appliances be applied in *NFPA 72*. It had been previously recommended for this purpose by this Code since 1979. It has since been adopted as both an American National Standard (ANSI S3.41, *American National Standard Audible Emergency Evacuation Signal*) and an International Standard (ISO 8201, *Audible Emergency Evacuation Signal*).

(CLARIFIED AND SIMPLIFIED THE “SHALL” LANGUAGE WHILE ADDING EXPLANATORY MATERIAL TO ANNEX A)

6.10.1.16* All circuits necessary for the operation of two-way telephone communication systems shall be installed using one of the following methods:

- (1) A 2-hour fire rated circuit integrity (CI) cable
- (2) A 2-hour fire rated cable system (electrical circuit protective system)
- (3) A 2-hour fire rated enclosure
- (4) Performance alternatives approved by the authority having jurisdiction
- (5) Buildings fully protected by an automatic sprinkler system installed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, with the wiring or cables installed in metal raceways and in accordance with Article 760 of NFPA 70

A.6.10.1.16 One or more of the following means might be considered acceptable to provide a level of survivability consistent with the intent of this requirement:

- (1) Routing two-way telephone circuits separately
- (2) Using short-circuit fault tolerant circuits

(ITEMS 4 & 5 ARE NEW AND ANNEX A MATERIAL IS NEW)

NFPA 72-2007 Changes

6.10.2* Two-Way In-Building Radio Communications Enhancement Systems.

A.6.10.2 Monitoring of the in-building two-way communications system by the fire control system is permissible. The following should be considered as part of the system design and monitoring criteria:

Monitoring (if provided):

- (1) Primary operating power
- (2) Secondary operating power
- (3) Antenna connections
- (4) Antenna integrity
- (5) Signal strength
- (6) Multi pathing
- (7) Interference
- (8) Channel integrity
- (9) Interconnecting wiring

Design:

- (1) Survivability
- (2) FCC licensing
- (3) Interior and external building reception
- (4) Testing and maintenance by licensing group
- (5) Environmental conditions
- (6) Future systems expansion

(NEW)

6.16.5.2* If connected to the fire alarm system serving the protected premises, all detection devices used to cause the operation of HVAC systems smoke dampers, fire dampers, fan control, smoke doors, and fire doors shall be monitored for integrity in accordance with 4.4.7.

A.6.16.5.2 See A.6.16.5.3.

(NEW ANNEX A MATERIAL)

6.16.5.3* Connections between fire alarm systems and the HVAC system for the purpose of monitoring and control shall operate and be monitored in accordance with applicable NFPA standards. Smoke detectors mounted in the air ducts of HVAC systems shall initiate either an alarm signal at the protected premises or a supervisory signal at a constantly attended location or supervising station.

A.6.16.5.3 This standard does not specifically require detection devices used to cause the operation of HVAC system smoke dampers, fire dampers, fan control, smoke doors, and fire doors to be connected to the fire alarm system. Connection to the fire alarm system would be determined by the requirements established by the authority having jurisdiction. See A.1.2.4.

(NEW ANNEX A MATERIAL)

NFPA 72-2007 Changes

6.16.7.3* For all exits connected in accordance with 6.16.7.1 and where batteries are used in accordance with 4.4.1.5.1(1) as the secondary power supply, the batteries shall not be utilized to maintain these doors in the locked condition unless the fire alarm control unit is arranged with circuitry and sufficient secondary power to ensure the exits will unlock within 10 minutes of loss of primary power.

A.6.16.7.3 A problem could exist when batteries are used as a secondary power source if a fire alarm control unit having 24 hours of standby operating power were to lose primary power and be operated for more than 24 hours from the secondary power source (batteries). It is possible that sufficient voltage would be available to keep the doors locked but not enough voltage would be available to operate the fire alarm control unit to release the locks.

(CLARIFICATION LANGUAGE WAS ADDED)

6.16.7.4 Locks powered by independent power supplies dedicated to lock power and access control functions and which unlock upon loss of power shall not be required to comply with 6.16.7.3.

(NEW)

6.16.7.6 All doors that are required to be unlocked by the fire alarm system in accordance with 6.16.7.1 through 6.16.7.5 shall remain unlocked until the fire alarm condition is manually reset.

(NEW)

6.16.8* Exit Marking Audible Notification Systems.

A.6.16.8 When a fire alarm evacuation signal activates, the exit marking system will be activated. In some cases, the activation may be sequenced to meet the fire safety plan of the property.

(NEW)

6.18 Mass Notification Systems. See Annex E.

(NEW)

Chapter 7 Notification Appliances

7.1.7 Notification appliances shall be permitted to be used within buildings or outdoors and to target the general building, area, or space, or only specific parts of a building, area, or space designated in specific zones and sub-zones.

(NEW)

NFPA 72-2007 Changes

7.3.3.2* Notification appliances used for signaling other than fire shall not have the word FIRE, or any fire symbol, in any form (i.e., stamped, imprinted, etc.) on the appliance visible to the public. Notification appliances with multiple visible elements shall be permitted to have fire markings only on those visible elements used for fire signaling.

A.7.3.3.2 The intent is to prohibit labeling that could give an incorrect message. Wording such as "Emergency" would be acceptable for labeling because it is generic enough not to cause confusion. Fire alarm systems are often used as emergency notification systems, and therefore attention should be given to this detail.

(NEW)

7.3.4* Mechanical Protection.

A.7.3.4 Situations exist where supplemental enclosures are necessary to protect the physical integrity of a notification appliance. Protective enclosures should not interfere with the performance characteristics of the appliance. If the enclosure degrades the performance, methods should be detailed in the manufacturer's published instructions of the enclosure that clearly identify the degradation. For example, where the appliance signal is attenuated, it might be necessary to adjust the appliance spacings or appliance output.

(MODIFIED)

7.4.1.2* The total sound pressure level produced by combining the ambient sound pressure level with all audible notification appliances operating shall not exceed 110 dBA at the minimum hearing distance.

A.7.4.1.2 The maximum sound pressure level permitted in a space is 110 dBA, reduced from 120 dBA in previous editions. The change from 120 dBA to 110 dBA is to coordinate with other laws, codes, and standards.

In addition to the danger of exposure to a high sound level, long-term exposure to lower levels may also be a problem when, for example, occupants must traverse long egress paths to exit or technicians test large systems over extended time periods.

This Code does not presume to know how long a person will be exposed to an audible notification system. The limit of 110 dBA has been set as a reasonable upper limit for the performance of a system. For workers who may be exposed to high sound levels over the course of a 40-year employment history, OSHA (Occupational, Health and Safety Administration) has established a maximum permitted dose before a hearing conservation program must be implemented. A worker exposed to 120 dBA for 7.5 minutes a day for 40 years might be in danger of suffering a hearing impairment. The OSHA regulation includes a formula to calculate a dose for situations where a person is exposed to different sound levels for different periods of time. The maximum permitted by the regulation is an 8-hour equivalent dose of 90 dBA. It is possible to calculate the dose a person experiences when traversing an egress path where the sound pressure level varies as they pass close to, then away from, audible appliances. Table A.7.4.1.2 depicts OSHA permissible noise exposures.

(DOWN FROM 120 dBA AND NEW ANNEX A MATERIAL)

NFPA 72-2007 Changes

Table A.7.4.1.2 Permissible Noise Exposures (NEW)

7.4.1.3* Sound from normal or permanent sources, having a duration greater than 60 seconds, shall be included when measuring maximum ambient sound level. Sound from temporary or abnormal sources shall not be required to be included when measuring maximum ambient sound level.

A.7.4.1.3 In determining maximum ambient sound levels, sound sources that should be considered include air-handling equipment and background music in a typical office environment, office cleaning equipment (vacuum cleaner), noisy children in a school auditorium, car engines in an auto shop, conveyor belts in a warehouse, and a running shower and fan in a hotel bathroom. Temporary or abnormal sound sources that can be excluded would include internal or external construction activities (i.e., office rearrangements and construction equipment).

("TEMPORARY" DEFINED AS LESS THAN 60 SECONDS)

7.4.1.5 Audible notification appliances for alert and evacuation signal tones shall meet the requirements of 7.4.2 (Public Mode Audible Requirements), 7.4.3 (Private Mode Audible Requirements), 7.4.4 (Sleeping Area Requirements), or 7.4.5 (Narrow Band Tone Signaling for Exceeding Masked Thresholds), as applicable.

(NEW)

7.4.1.6* Voice messages shall not be required to meet the audibility requirements of 7.4.2 (Public Mode Audible Requirements), 7.4.3 (Private Mode Audible Requirements), 7.4.4 (Sleeping Area Requirements), or 7.4.5 (Narrow Band Tone Signaling for Exceeding Masked Thresholds), but shall meet the intelligibility requirements of 7.4.1.4 where voice intelligibility is required.

A.7.4.1.6 Because voice is composed of modulated tones, it is not valid to compare loudness measurements of tone signals with loudness measurements of voice signals. A voice signal that is subjectively judged to be equally as loud as a tone signal will actually produce a dB reading below that of the tone signal. The modulated tones of a voice signal may have the same or greater peak amplitude as that of a tone signal. However, because they are modulated meters with fast or slow time constants will show a lower dB or dBA reading.

A voice signal must have sufficient audibility to result in intelligible communication. Intelligibility modeling/measurements (subject based and instrument based) include audibility as well as many other factors when determining whether a voice signal is adequate or not adequate.

Where a voice signal includes an audible alert or evacuation tone, the tone portion of the signal should meet the audible signal requirements listed in 7.4.2.

(NEW)

NFPA 72-2007 Changes

7.4.1.7 Audible notification appliances used for exit marking shall not be required to meet the audibility requirements of 7.4.2 (Public Mode Audible Requirements), 7.4.3 (Private Mode Audible Requirements), 7.4.4 (Sleeping Area Requirements), or 7.4.5 (Narrow Band Tone Signaling for Exceeding Masked Thresholds), except as required by 7.4.6 (Exit Marking Audible Appliance Requirements).
(NEW)

7.4.3.1 Audible notification appliances intended for operation in the private mode shall have a sound level of not less than 45 dBA at 3 m (10 ft) or more than 120 dBA at the minimum hearing distance from the audible appliance.
(DELETED)

7.4.8 Location of Audible Notification Appliances for Wide Area Signaling. Audible notification appliances for wide area signaling shall be installed in accordance with the requirements of the authority having jurisdiction, approved design documents, and the manufacturer's installation instruction to achieve the required performance.
(NEW)

7.5.2.5 Lights used to signal occupants to seek information or instructions shall be clear, nominal white, or other color as required by the emergency plan and the authority having jurisdiction for the area or building.
(NEW)

7.5.2.6* The strobe synchronization requirements of this chapter shall not apply where the visible notification appliances located inside the building are viewed from outside of the building.

A.7.5.2.6 It is not the intent to establish viewing and synchronization requirements for viewing locations outdoors. As an example, there is no need for floor No. 1 to be synchronized with floor No. 2 if there is no visible coupling as in an atrium. Studies have shown that the effect of strobes on photosensitive epilepsy lessens with distance and viewing angle.

As long as the composite flash rate is no greater than that produced by two listed strobes as allowed by 7.5.4.3.2, compliance is achieved.

Example: A ballroom has multiple synchronized strobes operating during an emergency, the doors exiting the ballroom are opened, and the strobes outside in the lobby and corridor are also operating. The strobes in the corridor and lobby are synchronized with each other, but the strobes outside the ballroom are not synchronized with the strobes inside the ballroom. This would be an acceptable application because the composite flash rate does not exceed that allowed by 7.5.4.3.2.

(NEW)

NFPA 72-2007 Changes

7.5.3* Appliance Photometrics. The light output shall comply with the polar dispersion requirements of ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired*, or equivalent.

(NEW ANNEX A MATERIAL REGARDING “BIG BOX STORES”)

7.5.4.2 Where low ceiling heights do not permit mounting at a minimum of 80 in., visible appliances shall be mounted within 6 in. of the ceiling. The room size covered by a strobe of a given value shall be reduced by twice the difference between the minimum mounting height of 80 in. and the actual, lower mounting height.

(NEW)

Table 7.5.4.3.1(b) Room Spacing for Ceiling-Mounted Visible Appliances
(LARGER ROOM SIZES ADDED TO TABLE)

7.5.4.3.2 (3)* Two groups of visible notification appliances, where visual appliances of each group are synchronized, in the same room or adjacent space within the field of view. This shall include synchronization of strobes operated by separate systems.

(NEW)

7.5.5 Location of Visible Notification Appliances for Wide Area Signaling. Visible notification appliances for wide area signaling shall be installed in accordance with the requirements of the authority having jurisdiction, approved design documents, and the manufacturer’s instructions to achieve the required performance.

(NEW)

7.10 Tactile Appliances.

(NEW)

7.12 Mass Notification Systems. See Annex E.

(NEW)

Chapter 8 Supervising Station Fire Alarm Systems

8.1.1* Where a protected premises fire alarm system has its signals sent to a supervising station, the entire system shall become a supervising station fire alarm system.

(NEW)

8.2 General.

(NEW)

NFPA 72-2007 Changes

8.2.1 Alarm Signal Disposition. Except as permitted by 11.7.8.2, all fire alarm signals received by a supervising station shall be immediately retransmitted to the public fire service communications center.

(NEW)

8.2.2 Other Signal Disposition. Signals received at a supervising station, other than fire alarm, shall be handled as required by Section 8.3, 8.4, or 8.5.

(NEW)

8.2.3* Change of Service.

(NEW)

8.2.3.1 Supervising station customers or clients shall be notified in writing within 30 days of any scheduled change in service that results in signals from their property being handled by a different supervising station facility.

(NEW)

8.2.3.2 Where the supervising station provides the required testing and where service changes covered by 8.2.3.1 occur, the supervising station shall test all zones, points, and signals from each affected property in accordance with the requirements of Chapter 10.

(NEW)

8.2.3.3 Where the supervising station does not provide the required testing and where service changes covered by 8.2.3.1 occur, the supervising station shall notify the prime contractor of the need to test all zones, points, and signals from each affected property in accordance with the requirements of Chapter 10.

(NEW)

8.3.1 System Scope. Fire alarm systems for central station service shall include the central station physical plant, exterior communications channels, subsidiary stations, and fire alarm and signaling equipment located at the protected premises.

(NEW)

8.3.4* Indication of Central Station Service. The prime contractor shall conspicuously indicate that the fire alarm system providing service at a protected premises complies with all the requirements of this Code through the use of a systematic follow-up program under the control of the organization that has listed the prime contractor.

(REFERENCE TO UL OR FM REPLACED WITH A GENERIC REFERENCE)

8.3.4.1 Documentation indicating code compliance of the fire alarm system shall be issued by the organization that has listed the prime contractor.

(REFERENCE TO UL OR FM REPLACED WITH A GENERIC REFERENCE)

NFPA 72-2007 Changes

8.3.4.2 The documentation shall include, at a minimum, the following information:

- (1) Name of the prime contractor involved with the ongoing code compliance of the central station service
- (2)* Full description of the fire alarm system as installed
- (3) Issue and expiration dates of the documentation
- (4) Name, address, and contact information of the organization issuing the document
- (5) Identification of the authority(ies) having jurisdiction for the central station service installation

(REFERENCE TO UL OR FM REPLACED WITH A GENERIC REFERENCE)

8.3.4.3 The documentation shall be physically posted within 1 m (3 ft) of the fire alarm control unit, and copies of the documentation shall be made available to the authority(ies) having jurisdiction upon request.

(REFERENCE TO UL OR FM REPLACED WITH A GENERIC REFERENCE)

8.3.4.4 A central repository of issued documentation, accessible to the authority having jurisdiction, shall be maintained by the organization that has listed the prime contractor.

(REFERENCE TO UL OR FM REPLACED WITH A GENERIC REFERENCE)

8.3.4.7 The authority(ies) having jurisdiction identified in 8.3.4.2(5) shall be notified of expiration or cancellation by the organization that has listed the prime contractor.

(NEW)

8.3.4.8 The subscriber shall surrender expired or canceled documentation to the prime contractor within 30 days of the termination date.

(NEW)

8.3.6.1.3 (Fire Alarm Systems for Central Station Service) Computer-aided alarm and supervisory signal-processing hardware and software shall be listed for the purpose.

(NEW)

8.3.7.1.2 The central station shall perform the following actions:

- (2) Dispatch a runner or technician to the protected premises to arrive within 2 hours after receipt of a signal if equipment needs to be manually reset by the

NFPA 72-2007 Changes

prime contractor. Except where prohibited by the authority having jurisdiction, the runner or technician shall be permitted to be recalled prior to arrival at the premises if a qualified representative of the subscriber at the premises can provide the necessary resetting of the equipment and is able to place the system back in operating condition.

(EXCEPTION LANGUAGE ADDED)

8.3.7.3* Supervisory Signals. Upon receipt of a supervisory signal from a sprinkler system, other fire suppression system(s), or other equipment, the central station shall perform the following actions:

(1)* Communicate immediately with the persons designated by the subscriber and notify the fire department or law enforcement agency, or both, when required by the authority having jurisdiction

(OLD ITEM (3) ADDED TO ITEM (1))

8.3.7.4 Trouble Signals. Upon receipt of trouble signals or other signals pertaining solely to matters of equipment maintenance of the fire alarm systems, the central station shall perform the following actions:

(3) When the interruption is more than 8 hours, provide notice to the subscriber and the fire department if so required by the authority having jurisdiction as to the nature of the interruption, the time of occurrence, and the restoration of service

(REPHRASED)

8.6.3.2.2 Digital Alarm Communicator Receiver (DACR).

8.6.3.2.2.1 Equipment.

(A) Spare DACRs shall be provided in the supervising or subsidiary station. The spare DACRs shall be on line or able to be switched into the place of a failed unit within 30 seconds after detection of failure.

(ADDED "...SHALL BE ONLINE OR ...")

8.6.3.4 Two-Way Radio Frequency (RF) Multiplex Systems.

8.6.3.4.1 Maximum Operating Time. The maximum end-to-end operating time parameters allowed for a two-way RF multiplex system shall be as follows:

(2) The maximum allowable time lapse from the occurrence of an adverse condition in any transmission channel until recording of the adverse condition is started shall not exceed 200 seconds for Type 4 and Type 5 systems. The requirements of 8.6.3.4.4 shall apply.

(MAXIMUM ALLOWABLE TIME LAPSE FOR AN ADVERSE CONDITION TO BE RECORDED CHANGED FROM 90 SECONDS to 200 SECONDS)

8.6.3.5 One-Way Private Radio Alarm Systems.

8.6.3.5.3.4 Personnel shall be dispatched to arrive within 12 hours to initiate maintenance after detection of primary power failure.

(NEW)

8.7 Mass Notification Systems. See Annex E.

(NEW)

Chapter 9 Public Fire Alarm Reporting Systems

9.2.3 Fiber optic cabling shall be considered an acceptable transmission medium, provided that the cabling and installation comply with the requirements of Section 9.7 and the conversion equipment used to interface to the fiber optic signal complies with all applicable requirements of Chapter 9.

(NEW)

9.2.4 All devices shall be designed to function satisfactorily under the climatic conditions to which they may be exposed.

(NEW)

9.3.7 Personnel Qualification.

9.3.7.1 System Designer.

9.3.7.1.1 Public fire 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 fire alarm reporting systems.

9.3.7.1.2 The system designer shall be identified on the system design documents.

9.3.7.2 System Installer. Installation personnel shall be qualified in the installation, inspection, and testing of public fire alarm reporting systems.

9.3.7.3 Service Personnel. Service personnel shall be qualified in the service, inspection, maintenance, and testing of public fire alarm reporting systems.

9.3.7.4 Qualification.

9.3.7.4.1 Personnel shall demonstrate qualification by being trained and certified in public fire alarm reporting system design, installation, or service (as appropriate) by one or more of the following:

- (1) Certified by the manufacturer of the system or equipment
- (2)* Certified by an organization acceptable to the authority having jurisdiction
- (3) Licensed or certified by a state or local authority

9.3.7.4.2 Evidence of qualifications and/or certification shall be provided when requested by the authority having jurisdiction. A license or qualification listing shall be current in accordance with the requirements of the issuing authority or organization.

(NEW)

9.4 Alarm Transmission Equipment (Publicly Accessible Fire Alarm Boxes, Auxiliary Boxes, and Master Boxes).

(RENAMED)

NFPA 72-2007 Changes

9.4.1.5 Box cases and parts that are accessible to the public shall be of insulating materials or permanently and effectively grounded. All ground connections to boxes shall comply with the requirements of NFPA 70, *National Electrical Code*, Article 250.

(“STREET BOXES” NOW “BOXES”)

9.4.2* Publicly Accessible Fire Alarm Boxes.

9.4.2.1 Fundamental Requirements. The requirements of 9.4.2.1.1 through 9.4.2.1.11 shall apply to all publicly accessible fire alarm boxes.

(“FIRE SERVICE BOXES (STREET BOXES)” NOW “FIRE ALARM BOXES”)

9.4.2.1.2 The box housing shall protect the internal components from the weather.

(“STREET BOX” NOW “BOX”)

9.4.2.1.3 Doors on boxes shall remain operable under adverse climatic conditions, including icing and salt spray.

(“STREET BOXES” NOW “BOXES”)

9.4.2.1.4 Boxes shall be recognizable as such and shall have instructions for use plainly marked on their exterior surfaces.

(“STREET BOXES” NOW “BOXES”)

9.4.2.1.5 Boxes shall be securely mounted on poles, pedestals, or structural surfaces as directed by the authority having jurisdiction.

(“STREET BOXES” NOW “BOXES”)

9.4.2.1.8 Boxes shall be conspicuously visible and be highlighted with a distinctive color.

(“STREET BOXES” NOW “BOXES”)

9.4.2.1.10* Location-designating lights of distinctive color, visible for at least 460 m (1500 ft) in all directions, shall be installed over boxes. The street light nearest the box, where equipped with a distinctively colored light, shall meet this requirement.

(“STREET BOXES” NOW “BOXES”)

9.4.2.1.11 Where boxes are installed inside a structure, the installation shall comply with 9.4.2.1.11.1 and 9.4.2.1.11.2.

(“STREET BOXES” NOW “BOXES”)

9.4.2.1.11.1 The box shall be placed as close as is practicable to the point of entrance of the circuit.

(“STREET BOX” NOW “BOX”)

NFPA 72-2007 Changes

9.4.2.1.11.2 The exterior wire shall be installed in rigid metal conduit or intermediate metal conduit in accordance with Chapter 3 of NFPA 70, *National Electrical Code*.

Exception: Schedule 80 rigid nonmetallic conduit shall be permitted for underground installations, provided all elbows used are rigid or intermediate metal conduit.

**(REPLACED EMT WITH RMC OR IMC)
(ADDED AN EXCEPTION ALLOWING SCHEDULE 80 RNC)**

9.4.2.2 Coded Wired Boxes. The requirements of Section 9.7 shall also apply.
(“CODED WIRED STREET BOXES” NOW “CODED WIRED BOXES”)

9.4.2.3 Coded Radio Boxes.
(“CODED RADIO STREET BOXES” NOW “CODED RADIO BOXES”)

9.4.2.3.1 In addition to the requirements of this Code, coded radio boxes shall be designed and operated in compliance with all applicable rules and regulations of the Federal Communications Commission (FCC) or, where required, the National Telecommunications and Information Administration (NTIA).

(ADDED “IN ADDITON...” AND ADDED REFERENCE TO NTIA)

9.4.3 Auxiliary Box.
(“AUXILIARY FIRE ALARM SYSTEMS” NOW “AUXILIARY BOX”)

9.4.3.1.2 All exterior wire and cable shall be installed in rigid metal conduit or intermediate metal conduit in accordance with Chapter 3 of NFPA 70, *National Electrical Code*.

Exception: Schedule 80 rigid nonmetallic conduit shall be permitted for underground installations, provided all elbows used are rigid or intermediate metal conduit.

(NEW)

9.4.3.2.3.14 Where data communications between a microprocessor-based fire alarm control unit and an auxiliary fire alarm system are utilized, they shall comply with the requirements of 9.4.3.2.3.14(A) through 9.4.3.2.3.14(C).

NFPA 72-2007 Changes

- (A) The monitoring for integrity shall include communications test messages transmitted between the fire alarm control unit and the auxiliary fire alarm system.
- (B) The communications test message shall be initiated by either the fire alarm control unit or the auxiliary fire alarm system and shall require a response from the corresponding unit, and the following shall apply:
- (1) An invalid response or no response from the fire alarm control unit or the auxiliary fire alarm system shall be recognized as a communications failure.
 - (2) A communications failure shall initiate a specific communications failure trouble message, which shall be transmitted from the auxiliary fire alarm system and shall be automatically indicated within 200 seconds at the public fire service communications center.
 - (3) A trouble condition in 9.4.3.2.3.14(B)(2) shall activate an audible and distinctive visual signal at the auxiliary box indicating a communications failure.
 - (4) A trouble condition shall activate a trouble signal at the fire command center or fire alarm control unit.
- (C) Where a separate device is required to interface the fire alarm control unit to the auxiliary fire alarm system, all communication paths shall be monitored for integrity and shall comply with 9.4.3.2.3.14.

(NEW)

9.7.1.4.2 Aerial cable shall be supported by messenger wire of approved tensile strength.

Exception No. 1: Two-conductor cable that has conductors of 20 AWG or larger size and has mechanical strength equal to 10 AWG hard-drawn copper.

Exception No. 2: Fiber optic cable with integral supporting means or all dielectric self-supporting (ADSS) type.

(NEW EXCEPTION NO. 2)

9.7.1.6.2* Where installed in buildings, conductors and fiber optic cables shall be installed in any of the following wiring methods:

- (1) Electrical metallic tubing
- (2) Intermediate metal conduit
- (3) Rigid metal conduit

Exception: Rigid nonmetallic conduit shall be permitted where approved by the authority having jurisdiction.

(MORE SPECIFIC WIRING METHODS AND ADDED THE EXCEPTION)

9.8 Mass Notification System. See Annex E.

(NEW)

Chapter 10 Inspection, Testing, and Maintenance

10.2.2.5*Service Personnel Qualifications and Experience.

NFPA 72-2007 Changes

A.10.2.2.5 Service personnel should be able to do the following:

- (1) Understand the requirements contained in the *National Fire Alarm Code* and the fire alarm requirements contained in the *National Electrical Code*
- (2) Understand basic job site safety laws and requirements
- (3) Apply troubleshooting techniques, and determine the cause of fire alarm system trouble conditions
- (4) Understand equipment specific requirements, such as programming, application, and compatibility
- (5) Read and interpret fire alarm system design documentation and manufacturer's inspection, testing, and maintenance guidelines
- (6) Properly use tools and test equipment required for testing and maintenance of fire alarm systems and their components
- (7) Properly apply the test methods required by the *National Fire Alarm Code*

(NEW ANNEX A MATERIAL)

10.2.2.5.1 Service personnel shall be qualified and experienced in the inspection, testing, and maintenance of fire alarm systems. Qualified personnel shall include, but not be limited to, one or more of the following:

- (1) *Personnel who are factory trained and certified for fire alarm system service of the specific type and brand of system
A.10.2.2.5.1(1) Factory training and certification is intended to allow an individual to service equipment only for which he or she has specific brand and model training.
- (2) *Personnel who are certified by a nationally recognized fire alarm certification organization acceptable to the authority having jurisdiction
A.10.2.2.5.1(2) Nationally recognized fire alarm certification programs might include those programs offered by the International Municipal Signal Association (IMSA) and National Institute for Certification in Engineering Technologies (NICET). NOTE: These organizations and the products or services offered by them have not been independently verified by the NFPA, nor have the products or services been endorsed or certified by the NFPA or any of its technical committees.
- (3) *Personnel who are registered, licensed, or certified by a state or local authority
A.10.2.2.5.1(3) Licenses and certifications offered at a state or local level are intended to recognize those individuals who have demonstrated a minimum level of technical competency in the area of fire alarm servicing.
- (4) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the servicing of fire alarm systems

(RE-WORDED AND NEW ANNEX A MATERIAL)

10.2.2.5.2 Evidence of qualifications shall be provided to the authority having jurisdiction upon request.

(NEW)

10.2.2.1* The property or building owner or the owner's designated representative shall be responsible for inspection, testing, and maintenance of the system and for alterations or additions to this system.

A.10.2.2.1 See definition of *Ownership* in 3.3.123.

(NEW ANNEX A INFO REGARDING THE DEFINITION OF AN OWNER)

10.2.6 Interface Equipment and Fire Safety Functions.

10.2.6.1* Testing personnel shall be qualified and experienced in the arrangement and operation of interface equipment and fire safety functions.

A.10.2.6.1 As an example, testing of the elevator fire service and shutdown functions will usually require a coordinated multi-discipline effort with presence of qualified service personnel for the fire alarm system, the elevator system, and other building systems. The presence of inspection authorities might also be needed in some jurisdictions. The development of a test plan should be considered to ensure that the testing of these features is accomplished in a coordinated and timely manner. This plan should also ensure that all appropriate parties and personnel are present when needed, and that the testing requirements for both the fire alarm system and the elevator system are fulfilled. See 6.16.3 and 6.16.4 for specific elevator fire safety functions.

(NEW)

10.2.6.2 Testing shall be accomplished in accordance with Table 10.4.2.2.

(NEW)

Table 10.3.1 Visual Inspection Frequencies

9. (h) Smoke detectors (excluding one- and two-family dwellings)

(NEW EXCLUSION)

11. Combination Systems

(a) Fire extinguisher monitoring device/systems

(b) Carbon monoxide detectors/systems

(ITEMS (a) and (b) ARE NEW)

14. Exit Marking Audible Notification Appliances

(NEW)

18. Public Fire Alarm Reporting System Transmission Equipment

(a) Publicly accessible fire alarm box

(b) Auxiliary box

(c) Master box

(1) Manual operation

(2) Auxiliary operation

(NEW)

10.4.1.1 Initial Acceptance Testing. All new systems shall be inspected and tested in accordance with the requirements of Chapter 10. The authority having jurisdiction shall be notified prior to the initial acceptance test.

(AHJ NOTIFICATION IS NEW)

Table 10.4.2.2 Test Methods

8. Public Fire Alarm Reporting System Transmission Equipment

(a) Publicly accessible fire alarm box

(b) Auxiliary box

NFPA 72-2007 Changes

- (c) Master box
 - (1) Manual operation
 - (2) Auxiliary operation

(NEW)

14. (j) Multi-sensor detector or multi-criteria detector or combination detector

(NEW)

15. (b) Audible textual notification appliances (speakers and other appliances to convey voice messages)

(ADDITIONAL INTELLIGIBILITY REQUIREMENTS)

16. Exit Marking Audible Notification Appliance

(NEW)

21. Combination Systems

- (a) Fire extinguisher monitoring device/system
- (b) Carbon monoxide detectors

(NEW)

23. Fire Safety Functions

(NEW)

10.4.3 Video Image Smoke and Flame Detectors. Video image smoke and flame detectors shall be inspected, tested, and maintained in accordance with the manufacturer's published instructions.

(NEW)

Table 10.4.4 Testing Frequencies

17. Combination Systems

- (a) Fire extinguisher monitoring device/systems
- (b) Carbon monoxide detectors/systems

(NEW)

21. Exit Marking Notification Appliances

(NEW)

10.4.11* In-Building Emergency Radio Communication Systems. In-building emergency radio communication systems shall be inspected and operationally tested in accordance with the manufacturer's published requirements by the local fire department, building owner, or a designated representative.

A.10.4.11 In-building emergency radio communication systems where the ac power source is monitored for integrity should be tested annually. Systems where the ac power source is not monitored for integrity should be tested quarterly.

(NEW)

10.6.1.2* For software-based systems, a copy of the site-specific software shall be provided to the owner or owner's designated representative. A copy of the software shall be stored in non-volatile non-erasable, non-rewritable memory and shall be stored on-site.

A.10.6.1.2 With many software-based fire systems, a copy of the site-specific software is required to restore system operation if a catastrophic system failure should occur. Without a back-up copy readily available on site, recovery of system operation by authorized service personnel can be substantially delayed.

The intent of this requirement is to provide authorized service personnel with an on-site copy of the site-specific software. The on-site copy should provide a means to recover the last installed and tested version of the site-specific operation of the system. This typically would be an electronic copy of the source files required to load an external programming device with the site-specific data. This requirement does not extend to the system executive software, nor does it require that the external programmer software if required be stored on site.

It is intended that this copy of the software be an electronic version stored on a non-rewritable media containing all of the file(s) or data necessary to restore the system and not just a printed version of the operation stored on electronic media. One example of a non-rewritable media is a CD-R.

(NEW)

10.6.2.3* A record of all inspections, testing, and maintenance shall be provided that includes the following information regarding tests and all the applicable information requested in Figure 10.6.2.3:

A.10.6.2.3 Figure A.10.6.2.3 provides an example of a filled-out Inspection and Testing Form.

(NEW PRE- FILLED OUT EXAMPLE FORM IN ANNEX A)

10.7 Mass Notification Systems. See Annex E.

(NEW ANNEX E)

Chapter 11 Single/Multiple Station Alarms & Household Fire Alarm Systems

11.1.2 The requirements of this chapter shall apply to installations in the following locations:

- (1) One- and two-family dwelling units
- (2) Sleeping rooms of lodging and rooming houses
- (3) Individual dwelling units of apartment buildings
- (4) Guest rooms, sleeping rooms, and living areas within guest suites of hotels and dormitories
- (5) Day-care homes
- (6) Residential board and care facilities

(DELETED)

11.1.1* The performance, selection, installation, operation, and use of single- and multiple-station alarms and household fire alarm systems shall comply with the requirements of this chapter.

NFPA 72-2007 Changes

A.11.1.1 The requirements of Chapter 11 are intended to apply to installations in the following new and existing locations:

- (1) One- and two-family dwelling units
- (2) Sleeping rooms of lodging and rooming houses
- (3) Individual dwelling units of apartment buildings
- (4) Guest rooms, sleeping rooms, and living areas within guest suites of hotels and dormitories
- (5) Day-care homes
- (6) Residential board and care facilities
- (7) Other locations where applicable laws codes or standards specify a requirement for the installation of smoke alarms

(NEW ANNEX A MATERIAL)

11.2* Purpose. Fire-warning equipment for residential occupancies shall provide a reliable means to notify the occupants of the presence of a threatening fire and the need to escape to a place of safety before such escape might be impeded by untenable conditions in the normal path of egress.

A.11.2 Household fires are especially dangerous at night when the occupants are asleep. Fires produce smoke and deadly gases that can overcome occupants while they are asleep. Furthermore, dense smoke reduces visibility. Most fire casualties are victims of smoke and gas inhalation rather than burns. To warn against a fire, Chapter 11 provides for smoke detectors (alarms) requirements in accordance with 11.5.1 and the associated annex recommends heat or smoke alarms or smoke detectors (alarms) in all other major areas.

(ADDITIONAL ANNEX A MATERIAL)

11.3.2 Fire warning equipment shall be installed in accordance with the listing and manufacturer's published instructions.

(NEW)

11.3.5.1 The audible emergency evacuation signal shall be permitted to be used for other devices as long as the desired response is immediate evacuation.

(NEW)

11.3.5.2* Fire warning equipment producing the audible emergency evacuation signal shall be permitted to incorporate voice notification under either or both of the following conditions:

- (1) Where the voice message is contained completely within the 1.5-second pause period of the audible emergency evacuation signal

NFPA 72-2007 Changes

- (2) Where the voice message complies with (a) and (b) as follows:
- (a) The voice message is first preceded by a minimum of eight cycles of the audible emergency evacuation signal
 - (b) The voice message periodically interrupts the signal for no longer than 10 seconds followed by a minimum of two cycles of the audible emergency evacuation signal between each voice message.

The initial eight-cycle period shall not be required to be repeated.

(NEW)

11.3.8* Signals from notification appliances shall not be required to be synchronized.

A.11.3.8 Additional notification devices are recommended for the deaf and hard of hearing. These devices include, but are not limited to, supplemental tactile notification devices. These devices should initiate in response to the activation of fire-warning equipment.

(NEW ANNEX A MATERIAL)

11.5.1* Required Detection

A.11.5.1 For the preceding reasons, the required protection in this Code utilizes smoke alarms as the primary life safety equipment for providing a reasonable level of protection against fire.

The installation of additional alarms of either the smoke or heat type should result in a higher degree of protection. Adding alarms to rooms that are normally closed

off from the required alarms increases the escape time because the fire does not need to build to the higher level necessary to force smoke out of the closed room to the required alarms. As a consequence, it is recommended that the householder consider the installation of additional fire protection devices. However, it should be understood that Chapter 11 does not require additional smoke alarms over and above those called for in 11.5.1. Refer to Figure A.11.5.1(a) through Figure A.11.5.1(d) where required smoke alarms are shown.

Where to Locate the Required Smoke Alarms. The major threat from fire in a dwelling unit occurs at night when everyone is asleep. Persons in sleeping areas can be threatened by fires in the remainder of the unit; therefore, smoke alarms are best located in each bedroom and between the bedroom areas and the rest of the unit as shown in Figure A.11.5.1(b). In dwelling units with more than one bedroom area or with bedrooms on more than one floor, more than one smoke alarm is required, as shown in Figure A.11.5.1(c).

In addition to smoke alarms outside of the sleeping areas and in each bedroom, Chapter 11 requires the installation of a smoke alarm on each additional level of the dwelling unit, including the basement. These installations are shown in Figure A.11.5.1(d). The living area smoke alarm should be installed in the living room or near the stairway to the upper level, or in both locations. The basement smoke alarm should be installed in close proximity to the stairway leading to the floor above. Where installed on an open-joisted ceiling, the smoke alarm should be placed on the bottom of the joists. The smoke alarm should be positioned relative to the stairway so as to intercept smoke coming from a fire in the basement before the smoke enters the stairway.

Are More Smoke Alarms Desirable? The required number of smoke alarms might not provide reliable early warning protection for those areas separated by a door from the areas protected by the required smoke alarms. For this reason, the use of additional smoke alarms for those areas for increased protection is recommended. The additional areas include the basement, bedrooms, dining room, furnace room, utility room, and hallways not protected by the required smoke alarms. The installation of smoke alarms in kitchens, attics (finished or unfinished), or garages is not normally recommended, because these locations occasionally experience conditions that can result in improper operation.

(ADDITIONAL ANNEX A MATERIAL)

11.5.1.1* Where required by applicable laws, codes, or standards for a specific type of occupancy, approved single- and multiple-station smoke alarms shall be installed as follows:

A.11.5.1.1 Occupancies where smoke alarms are typically required include residential, residential board and care, or day-care home. The term *residential occupancy* is defined in 3.3.164 and includes one- and two-family dwellings; lodging or rooming houses; hotels, motels, and dormitories; and apartment buildings. The term *residential board and care occupancy* is defined in 3.3.164 and

NFPA 72-2007 Changes

includes both small and large facilities. NFPA 101, *Life Safety Code*, specifies a small facility to be one with sleeping accommodations for not more than 16 residents. The term *day-care home*, defined in 3.3.40, is a specific category of day-care occupancy. It should be noted that applicable laws, codes, or standards might include conditions that could impact the applicability of these requirements. The local authority should be consulted for specific details.

- (1)* In all sleeping rooms and guest rooms
A.11.5.1.1(1) The term *sleeping room* applies to several occupancies including: one- and two-family dwellings; lodging or rooming houses; hotels, motels, and dormitories; apartment buildings; residential board and care facilities; and day-care homes. The term *guest room*, defined in 3.3.82, is an accommodation that includes sleeping facilities. It applies in the context of hotel and dormitory occupancies.
- (2)* Outside of each separate dwelling unit sleeping area, within 21 ft of any door to a sleeping room, the distance measured along a path of travel
A.11.5.1.1(2) The term *dwelling unit* is defined in 3.3.54 and applies to one- and two-family dwellings and dwelling units of apartment buildings (including condominiums).
- (3) On every level of a dwelling unit, including basements
- (4) On every level of a residential board and care occupancy (small facility), including basements and excluding crawl spaces and unfinished attics
- (5)* In the living area(s) of a guest suite
A.11.5.1.1(5) The term *guest suite* is defined in 3.3.83, and the term *living area* is defined in 3.3.95.
- (6) In the living area(s) of a residential board and care occupancy (small facility)

(MORE SPECIFIC REQUIREMENTS, EXCEPTIONS REMOVED, ITEMS 5 & 6 ARE NEW, NEW ANNEX A MATERIAL)

11.5.1.2 Where the area addressed in 11.5.1.1(2) is separated from the adjacent living areas by a door, a smoke alarm shall be installed in the area between the door and the sleeping rooms, and additional alarms shall be installed on the living area side of the door as specified by 11.5.1.1 and 11.5.1.3.

(NEW)

11.5.1.3 In addition to the requirements of 11.5.1.1(1) through 11.5.1.1(3), where the interior floor area for a given level of a dwelling unit, excluding garage areas, is greater than 1000 ft², smoke alarms shall be installed per 11.5.1.3.1 and 11.5.1.3.2.

(NEW)

11.5.1.3.1* All points on the ceiling shall have a smoke alarm within a distance of 30 ft travel distance or shall have an equivalent of one smoke alarm per 500 ft² of floor area. One smoke alarm per 500 ft² is evaluated by dividing the total interior square footage of floor area per level by 500 ft².

A.11.5.1.3.1 The requirements do not preclude the installation of smoke alarms on walls in accordance with 11.8.3.4. Some building configurations, such as division of rooms and open foyers or great rooms, may dictate that alarms be located so that

NFPA 72-2007 Changes

they do not cover distinctly separate 500 ft² areas but rather provide overlapping coverage relative to this spacing requirement.

(NEW)

11.5.1.3.2 Where dwelling units include great rooms or vaulted/cathedral ceilings extending over multiple floors, smoke alarms located on the upper floor that are intended to protect the aforementioned area shall be permitted to be considered as part of the lower floor(s) protection scheme used to meet the requirements of 11.5.1.3.1.

(NEW)

11.5.2 Required Occupant Notification.

11.5.2.1 Fire warning equipment used to provide required or optional detection shall produce audible fire alarm signals that comply with 11.5.2.1.1 or 11.5.2.1.2.

(NEW)

11.5.2.1.1* Smoke and Heat Alarms. Unless exempted by applicable laws, codes, or standards, smoke or heat alarms used to provide a fire warning function, and when two or more alarms are installed within a dwelling unit, suite of rooms, or similar area, shall be arranged so that the operation of any smoke or heat alarm causes all alarms within these locations to sound.

Exception: The arrangement for all alarms to sound shall not be required for mechanically powered single-station heat alarms.

A.11.5.2.1.1 Fire-warning performance is improved when all alarms are interconnected so that alarm notification is achieved throughout the occupiable areas. In some cases for existing construction, interconnection of alarms is specifically exempted by jurisdictional requirements. This allowance takes into consideration the cost of hard-wired interconnection.

(NEW)

11.5.2.1.2 Household Fire Alarm System. Where a household fire alarm system is used to provide a fire warning function, notification appliances shall be installed to meet the performance requirements of 7.4.2 and 7.4.4.

(NEW)

11.5.2.2* Unless otherwise permitted by the authority having jurisdiction, audible fire alarm signals shall sound only in an individual dwelling unit, suite of rooms, or similar area and shall not be arranged to operate fire warning equipment or fire alarm systems outside these locations. Remote annunciation shall be permitted.

(NEW)

11.5 Detection and Notification.

NFPA 72-2007 Changes

- 11.5.1* One- and Two-Family Dwelling Units.
- 11.5.2 Lodging or Rooming Houses.
- 11.5.3 New Apartment Buildings.
- 11.5.4 Existing Apartment Buildings.
- 11.5.5 New Hotels and Dormitories.
- 11.5.6 Existing Hotels and Dormitories.
- 11.5.7 New Day-Care Homes.
- 11.5.8 Existing Day-Care Homes.
- 11.5.9 New Residential Board and Care — Small Facility.
- 11.5.10 New Residential Board and Care — Large Facility.
- 11.5.11 Existing Residential Board and Care — Small Facility.
- 11.5.12 Existing Residential Board and Care — Large Facility.

(DELETED)

11.6 Power Supplies.

11.6.1 Smoke and Heat Alarms. Smoke and heat alarms shall be powered by one of the following means:

- (1) A commercial light and power source along with a secondary power source that is capable of operating the device for at least 24 hours in the normal condition followed by 4 minutes of alarm.
- (2) If a commercial light and power source is not normally available, a noncommercial ac power source along with a secondary power source that is capable of operating the device for at least 7 days in the normal condition followed by 4 minutes of alarm.
- (3) A nonrechargeable, nonreplaceable primary battery that is capable of operating the device for at least 10 years in the normal condition followed by 4 minutes of alarm, followed by 7 days of trouble.
- (4) If a battery primary power supply is specifically permitted, a battery meeting the requirements of 11.6.6 (nonrechargeable primary battery) or the requirements of 11.6.7 (rechargeable primary battery) shall be used.
- (5) A suitable spring-wound mechanism for the nonelectrical portion of a listed single-station alarm. A visible indication shall be provided to show that sufficient operating power is not available.

(ITEM #5 IS NEW)

11.6.2 Household Fire Alarm Systems. Power for household fire alarm systems shall comply with the following requirements:

- (1) Household fire alarm systems shall have two independent power sources consisting of a primary source that uses commercial light and power and a secondary source that consists of a rechargeable battery.
- (2) The secondary source shall be capable of operating the system for at least 24 hours in the normal condition followed by 4 minutes of alarm.

NFPA 72-2007 Changes

- (3) The secondary power source shall be supervised and shall cause a distinctive audible and visible trouble signal upon removal or disconnection of a battery or a low-battery condition.
- (4) A rechargeable battery used as a secondary power source shall meet the following criteria:
 - (a) Be automatically recharged by an ac circuit of the commercial light and power source
 - (b) Be recharged within 48 hours
 - (c) Provide a distinctive audible trouble signal before the battery is incapable of operating the device(s) for alarm purposes

(ITEMS #3 AND #4 ARE NEW)

11.6.3 AC Primary Power Source. The ac power source shall comply with the following conditions:

- (1) A visible "power on" indicator shall be provided.
- (2) All electrical systems designed to be installed by other than a qualified electrician shall be powered from a source not in excess of 30 volts that meets the requirements for power-limited fire alarm circuits as defined in NFPA 70, *National Electrical Code*, Article 760.
- (3) A restraining means shall be used at the plug-in of any cord-connected installation.
- (4) AC primary (main) power shall be supplied either from a dedicated branch circuit or the unswitched portion of a branch circuit also used for power and lighting.
- (5) Operation of a switch (other than a circuit breaker) or a ground-fault circuit-interrupter shall not cause loss of primary (main) power. Smoke alarms powered by AFCI-protected circuits shall have a secondary power source.
- (6) Neither loss nor restoration of primary (main) power shall cause an alarm signal.

Exception: An alarm signal shall be permitted but shall not exceed 2 seconds.

- (7) Where a secondary (standby) battery is provided, the primary (main) power supply shall be of sufficient capacity to operate the system under all conditions of loading with any secondary (standby) battery disconnected or fully discharged.

(ITEM #5 - NEW AFCI SECONDARY POWER REQUIREMENT)

(ITEM #5 - WHOLE-HOUSE GFCI EXCEPTION DELETED)

11.6.8 Secondary (Standby) Non-Battery Power Source. Where alarms include a secondary power source (non-battery), the following conditions shall be met:

- (1) The secondary power source shall be supervised and shall cause a distinctive audible or visible trouble signal upon depletion or failure.
- (2) A distinctive audible trouble signal shall be provided before the power source is incapable of operating the device(s) for alarm purposes.

NFPA 72-2007 Changes

- (3) At a power source condition at which a trouble signal is obtained, the power source shall be capable of producing an alarm signal for at least 4 minutes followed by not less than 7 days of trouble signal operation.
- (4) The audible trouble signal shall be produced at least once every minute for 7 consecutive days.
- (5) A rechargeable secondary power source shall meet the following criteria:
 - (a) Be automatically recharged
 - (b) Be recharged within 4 hours where power is provided from a circuit that can be switched on or off by means other than a circuit breaker or within 48 hours where power is provided from a circuit that cannot be switched on or off by means other than a circuit breaker

(NEW)

11.7.2* **Smoke Alarms and System Smoke Detectors.** Each device shall detect abnormal quantities of smoke, shall operate in the normal environmental conditions, and shall be in compliance with applicable standards such as ANSI/UL 268, *Standard for Safety Smoke Detectors for Fire Alarm Signaling Systems*, or ANSI/UL 217, *Standard for Safety Single and Multiple Station Smoke Alarms*.

A.11.7.2 The UL listing for smoke alarms addresses two categories of these devices: one for applications where sensitivity testing is not required [UTGT], and one for applications where sensitivity testing is required [UTHA]. Refer to the testing requirements for these devices in Chapter 10.

(NEW)

11.8.2.2* The interconnection of smoke or heat alarms shall comply with the following:

- (1) Smoke or heat alarms shall not be interconnected in numbers that exceed the manufacturer's published instructions.
- (2) In no case shall more than 18 initiating devices be interconnected (of which 12 can be smoke alarms) where the interconnecting means is not supervised.
- (3) In no case shall more than 64 initiating devices be interconnected (of which 42 can be smoke alarms) where the interconnecting means is supervised.
- (4) Smoke or heat alarms shall not be interconnected with alarms from other manufacturers unless listed as being compatible with the specific model.

A.11.8.2.2 Once these limits have been exceeded, a fire alarm system should be installed.

(ITEM #4 IS NEW AND NEW ANNEX A MATERIAL)

11.8.3* **Smoke Detectors and Smoke Alarms.** Smoke alarms, smoke detectors, devices, combination of devices, and equipment shall be installed in accordance with the manufacturer's listing and published instructions, and unless specifically listed for the application, shall comply with requirements in 11.8.3.1 through 11.8.3.5.

A.11.8.3 One of the most critical factors of any fire alarm system is the location of the fire detecting devices. This annex is not a technical study. It is an attempt to provide some fundamentals on alarm or detector location. For simplicity, only those

types of alarms or detectors recognized by Chapter 11 (e.g., smoke and heat alarms or detectors) are discussed. In addition, special problems requiring engineering judgment, such as locations in attics and in rooms with high ceilings, are not covered.

Smoke Alarm or Smoke Detector Mounting — Dead Air Space. The smoke from a fire generally rises to the ceiling, spreads out across the ceiling surface, and begins to bank down from the ceiling. The corner where the ceiling and wall meet is an air space into which the smoke could have difficulty penetrating. In most fires, this dead air space measures about 0.1 m (4 in.) along the ceiling from the corner and about 0.1 m (4 in.) down the wall, as shown in [Figure A.11.8.3](#). Detectors should not be placed in this dead air space.

Smoke and heat detectors should be installed in those locations recommended by the manufacturer's published instructions, except in those cases where the space above the ceiling is open to the outside and little or no insulation is present over the ceiling. Such cases result in the ceiling being excessively cold in the winter or excessively hot in the summer. Where the ceiling is significantly different in temperature from the air space below, smoke and heat have difficulty reaching the ceiling and a detector that is located on that ceiling. In this situation, placement of the detector on a sidewall, with the top 0.1 m to 0.3 m (4 in. to 12 in.) from the ceiling, is recommended.

The situation described previously for uninsulated or poorly insulated ceilings can also exist, to a lesser extent, in the case of outside walls. The recommendation is to place the smoke alarm or smoke detector on a sidewall. However, where the sidewall is an exterior wall with little or no insulation, an interior wall should be selected. It should be recognized that the condition of inadequately insulated ceilings and walls can exist in multifamily housing (apartments), single-family housing, and mobile homes.

(NEW)

A.11.8.3.4 See Figure A.11.8.3 for an example of proper mounting for smoke alarms.

A.11.8.4 While Chapter 11 does not require heat detectors as part of the basic protection scheme, it is recommended that the householder consider the use of additional heat detectors for the same reasons presented under A.11.8.3. The additional areas lending themselves to protection with heat detectors are the kitchen, dining room, attic (finished or unfinished), furnace room, utility room, basement, and integral or attached garage. For bedrooms, the installation of a smoke alarm or smoke detector is recommended over the installation of a heat detector for protection of the occupants from fires in their bedrooms.

11.8.3.5 Specific Location Requirements. The installation of smoke alarms and smoke detectors shall comply with the following requirements:

- (1) Smoke alarms and smoke detectors shall not be located where ambient conditions, including humidity and temperature, are outside the limits specified by the manufacturer's published instructions.
- (2) Smoke alarms and smoke detectors shall not be located within unfinished attics or garages or in other spaces where temperatures can fall below 40°F or exceed 100°F.

NFPA 72-2007 Changes

- (3) Where the mounting surface could become considerably warmer or cooler than the room, such as a poorly insulated ceiling below an unfinished attic or an exterior wall, smoke alarms and smoke detectors shall be mounted on an inside wall.
- (4) Smoke alarms and smoke detectors installed within a 20 ft horizontal path of a cooking appliance shall be equipped with an alarm-silencing means or be of the photoelectric type.
- (5) Smoke alarms and smoke detectors shall not be installed within a 36 in. horizontal path from a door to a bathroom containing a shower or tub.
- (6) Smoke alarms and smoke detectors shall not be installed within a 36 in. horizontal path from the supply registers of a forced air heating or cooling system and shall be installed outside of the direct airflow from those registers.
- (7) Smoke alarms and smoke detectors shall not be installed within a 36 in. horizontal path from the tip of the blade of a ceiling-suspended (paddle) fan.
- (8) Where stairs lead to other occupied levels, a smoke alarm or smoke detector shall be located so that smoke rising in the stairway cannot be prevented from reaching the smoke alarm or smoke detector by an intervening door or obstruction.
- (9) For stairways leading up from a basement, smoke alarms or smoke detectors shall be located on the basement ceiling near the entry to the stairs.
- (10)* For tray-shaped ceilings (coffered ceiling) smoke alarms and smoke detectors shall be installed on the highest portion of the ceiling or on the sloped portion of the ceiling within 12 in. vertically down from the highest point.
A.11.8.3.5(10) Figure A.11.8.3.5(10) illustrates acceptable locations for tray-shaped ceilings.

(ITEM #10 IS NEW AND NEW ANNEX A MATERIAL FOR ITEM #10)

11.12 Mass Notification Systems. See Annex E.

(NEW)