



**National Fire Protection Association**

The authority on fire, electrical, and building safety

# NFPA 72<sup>®</sup> *National Fire Alarm and Signaling Code*

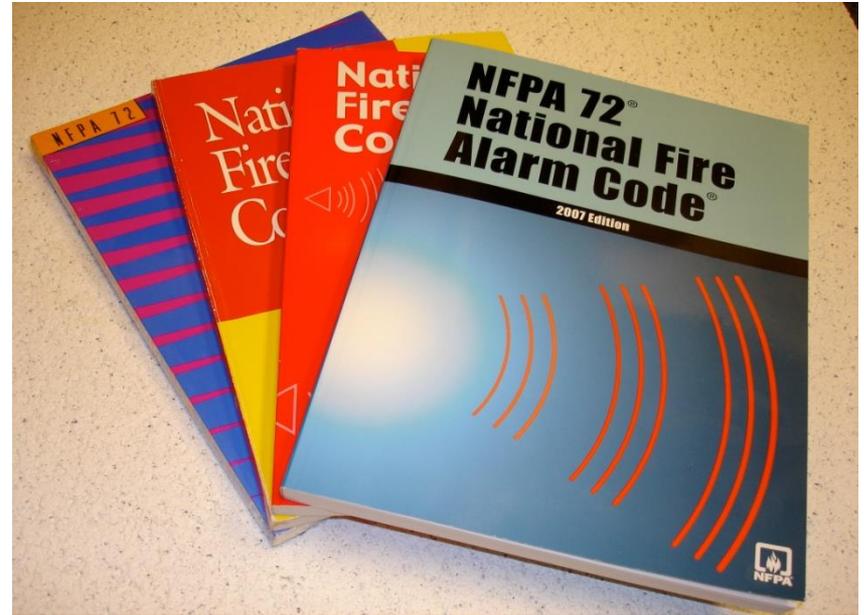
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## 2016 Changes

November 18, 2015 | Richard Roux

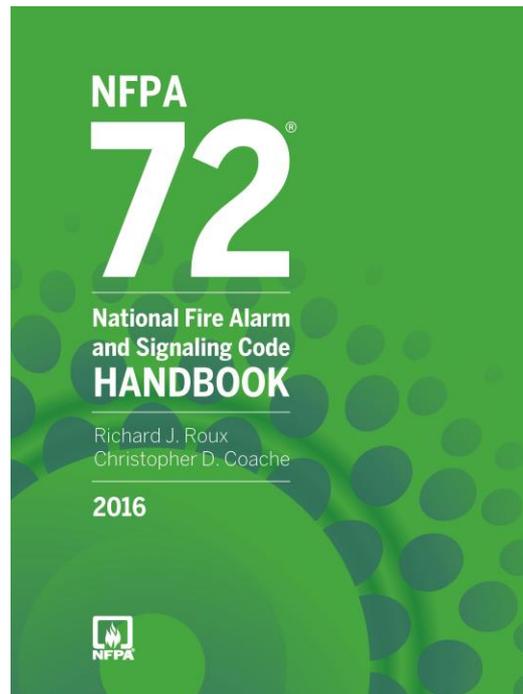
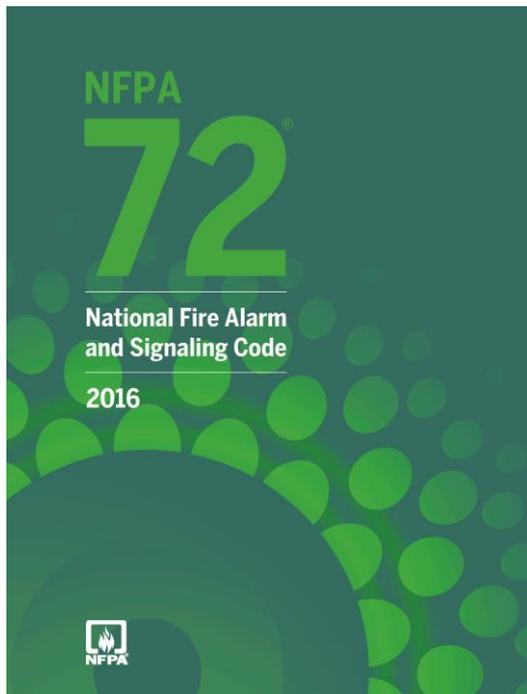
# NFPA 72 since 1993

- 1993 Edition Aug 20, 1993
- 1996 Edition Aug 09, 1996
- 1999 Edition Aug 13, 1999
- 2002 Edition Aug 08, 2002
- 2007 Edition Aug 17, 2006
- 2010 Edition Aug 26, 2009
- 2013 Edition Aug 29, 2012
- **2016 Edition Sep 07, 2015**



# NFPA 72-2016 Changes

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# NFPA 72-2016 (A2015)

	Chapter	PI	FR	PC	SR	NITMAM
• SIG-FUN	1, 10	206	47	42	17	
• SIG-TMS	14, D, G	54	17	21	4	2
• SIG-IDS	17, B	19	15	3	1	
• SIG-NAS	18, E	16	8	8	4	2
• SIG-PRO	12, 21, 23, C	124	68	66	33	3
• SIG-ECS	24	80	49	34	17	2
• SIG-SSS	26	69	38	16	4	2
• SIG-PRS	27	0	9	6	4	
• SIG-HOU	29	32	16	12	5	
		<b>600</b>	<b>267</b>	<b>208</b>	<b>89</b>	<b>11</b>



# NFPA 72-2016 Changes

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## Major Changes – Chapter 2 Referenced Publications

- Updated all date references for
  - NFPA Publications
  - ANSI Publications
  - IMSA Publications
  - ISO Publications
- Added NFPA 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiner*, as this reference was added in Chapter 10



# NFPA 72-2016 Changes

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## Major Changes – Chapter 3 Definitions

- Revised definitions: Alarm; Level Ceilings; Emergency Control Functions; Emergency Response Plan; Dedicated Function Fire Alarm Control Unit; Impairment; Low-Power Radio Transmitter/Transceiver; Wired Network (Public Emergency Alarm Reporting Systems); Wireless Network (Public Emergency Alarm Reporting Systems); Textual Visible Notification Appliance; Type A Public Emergency Alarm Reporting System; Type B Public Emergency Alarm Reporting System; Qualified; Radio Alarm System (RAS); Shop Drawings; Signal; Spacing; Evacuation Signaling Zone
- (Continued on next slide)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 3 Definitions

- New definitions: Alarm Repeater System [Chapter 27]; Device (Class N) [Chapters 12, 23]; Endpoint (Class N) [Chapters 12, 23]; Mechanically Powered [Chapter 29]; Single-Station Heat Alarm [Chapter 29]; In-writing [Chapter 10]; Response Time Index (RTI) [Chapter 17]; Signaling Zone
- Deleted definitions: Derived Channel; Donor Antenna; Donor Site; Dual Control; Evacuation Signaling Zone; Emergency Impairment; Planned Impairment; Open Area Detection (Protection); Parallel Telephone System; Private Radio Signaling; Scanner
- Updated all extract definitions from NFPA documents (NFPA 70 (NEC), LSC 101, 654, 720, 1221, 5000)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 7 Documentation

- **7.1.2** The documentation of the alteration, maintenance, and testing of existing systems ~~previously installed under this Code~~ shall comply with the minimum requirements of this chapter.

# NFPA 72-2016 Changes

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## Major Changes – Chapter 7 Documentation

- **7.1.6** The requirements of ~~other chapters~~ Chapters 10, 12, 14, 17, 18, 21, 23, 24, 26, and 27 shall also apply unless they are otherwise noted in conflict with this chapter.

# NFPA 72-2016 Changes

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## Major Changes – Chapter 7 Documentation

- Revised and added items to the minimum documentation required in 7.2.1
- Revised 7.5.4 to list the documentation required for new emergency communications systems relocated from Chapter 24
- Revised 7.5.7 to include the software documentation requirements relocated from Chapter 14 and added criteria for access credentials
- Added 7.7.1.5 permitting the emergency communications system (ECS) and fire alarm system as-built plans and other related documentation to be maintained together
- Added 7.7.2.6 regarding review of electronic documentation media formats



# NFPA 72-2016 Changes

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## Major Changes – Chapter 10 Fundamentals

- Revised throughout to reflect the broader application of alarm, signaling, and communications systems
- Revised 10.3.4 to remove ambiguity and unenforceable language
- Added requirements in 10.5.1 to address documentation of qualifications for a system designer and allowance for system design trainees to design systems
- Added requirements to 10.5.3.5 to address the qualifications of personnel who program systems
- (Continued on next slide)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 10 Fundamentals

- Added 10.5.4 to address plans examiners and inspectors and 10.5.6 to address public emergency alarm reporting personnel qualifications
- Revised 10.6.5.4 to require an approved breaker locking device
- Revised 10.6.8 to include examples of other equipment requiring primary and secondary power
- Revised 10.6.10.2 and 10.6.10.3 to clarify requirements for batteries and for battery charging
- Added 10.11.3 to clarify the intent for the operation of visible notification appliances for non-emergency paging



# NFPA 72-2016 Changes

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## Major Changes – Chapter 12 Circuits and Pathways

- Added subsection 12.3.6 to address the Class N pathway performance designation
- Revised the Class A and Class X pathway separation requirements in 12.3.8, including language explaining that 12.3.8.1(3) is not intended to permit emergency control function interface devices controlled by the fire alarm system to be installed on a circuit where the outgoing and return “legs” are installed in the same raceway within the 1000 ft<sup>2</sup> (93 m<sup>2</sup>) space



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# NFPA 72-2016 Changes

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## Major Changes – Chapter 12 Circuits and Pathways

- Added Annex A material within Section 12.4 to provide additional guidance on pathway survivability
- Added “or fire-resistive” as an alternative to circuit integrity (CI) cable and revised the performance alternatives for pathway survivability Level 2 and pathway survivability Level 3 in 12.4.3 and 12.4.4



# NFPA 72-2016 Changes

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## Major Changes – Chapter 14 Inspection, Testing, and Maintenance

- Added language in 14.2.2.2.4 requiring notification of the owner in writing in the event that any recalled equipment is observed during inspection and testing
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# NFPA 72-2016 Changes

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## Major Changes – Chapter 14 Inspection, Testing, and Maintenance

- Clarified in 14.3.4 and 14.3.5 that periodic visual inspections are intended to assure there are no changes that could affect the performance of the system. The intent of the visual inspections during an acceptance test or reacceptance test is to ensure compliance with the approved design documents and to make certain that installation is in accordance with this Code and other required installation standards
- Removed testing requirements for radio communications enhancement systems; the Code now refers to NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, for the testing requirements



# NFPA 72-2016 Changes

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## Major Changes – Chapter 14 Inspection, Testing, and Maintenance

- Table 14.4.3.2 Line 4(f) add new to paragraph to Method column.  
~~Perform tests to ensure the monitoring of integrity of the transmission technology and technology path.~~  
Where shared communications equipment is used as permitted by 26.6.3.1.14, provided secondary (standby) power sources shall be tested in accordance with Table 14.4.3.2, Sections 7, 8 or 9 as applicable.

# NFPA 72-2016 Changes

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## Major Changes – Chapter 17 Initiating Devices

- Revised and reordered 17.4.7 and clarified that the associated requirements for remote alarm indication are applicable to all fire detectors
- Revised 17.5.3.1 to eliminate reference to closets, elevator shafts, enclosed stairways, dumbwaiter shafts, and chutes; expanded the associated annex to address general consideration for shafts with regard to the “total coverage” detection approach
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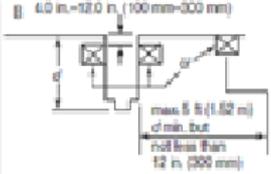
# NFPA 72-2016 Changes

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## Major Changes – Chapter 17 Initiating Devices

- Revised several of the requirements for placement of smoke detectors used for door release to provide additional flexibility in locating detectors; revised Figure 17.7.5.6.5.1(A) to delete the minimum 4 in. (100 mm) requirement for placement of detectors on sidewalls
- (Continued on next slide)

# NFPA 72-2016 Changes

Depth of wall section above door	Door frame mounted	Ceiling or wall mounted
$d$	Smoke detector listed for frame mounting or as part of closer assembly	Smoke detector ceiling or wall mounted
0-24 in. (0-610 mm) on both sides of doorway	 <p>Detector or detector closer mounted on either side</p>	 <p>One ceiling-mounted detector on either side or one wall-mounted detector on each side</p>

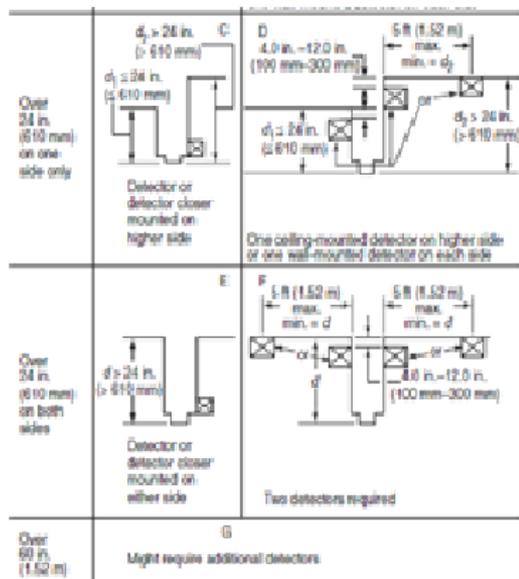


FIGURE 17.7.5.6.5.1(A) Detector Location Requirements for Wall Sections.

# NFPA 72-2016 Changes

## Major Changes – Chapter 17 Initiating Devices

- Revised Figure 17.7.5.6.5.3(B) and Figure 17.7.5.6.5.3(C) to specify a  $\pm 24$  in. (0.6 m) tolerance for smoke detectors located at group doorways when using smoke detectors for the purpose of door release

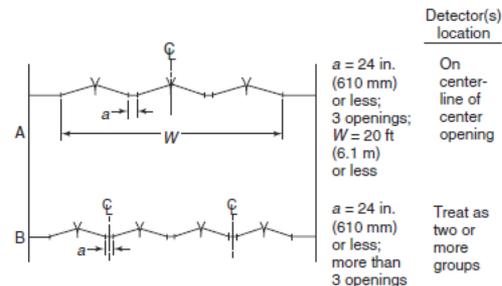


FIGURE 17.7.5.6.5.3(B) Detector(s) Location  $\pm 24$  in. (0.6 m) Requirements for Group Doorways.

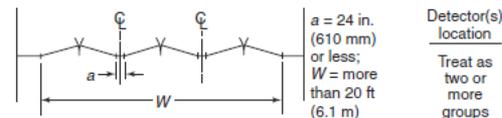


FIGURE 17.7.5.6.5.3(C) Detector(s) Location  $\pm 24$  in. (0.6 m) Requirements for Group Doorways over 20ft (6.1m) in Width.

# NFPA 72-2016 Changes

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## Major Changes – Chapter 18 Notification Appliances

- Added 18.4.2.3.2 to permit the mass notification system to interrupt the minimum repetition of audible alert and evacuation signals
- (Continued on next page)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 18 Notification Appliances

- 18.4.5.3\* ~~Effective January 1, 2014, audible~~Audible appliances provided for the sleeping areas to awaken occupants shall produce a low frequency alarm signal that complies with the following:
  - (1) The alarm signal shall be a square wave or provide equivalent awakening ability.
  - (2) The ~~wave~~waveform shall have a fundamental frequency of 520 Hz  $\pm$  10 percent.
  - (3) \*The notification equipment shall be listed for producing the low frequency waveform

# NFPA 72-2016 Changes

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## Major Changes – Chapter 18 Notification Appliances

- Revised 18.5.3.2 to reduce the pulse duration for flashing lights from 200 milliseconds to 20 milliseconds. The exception permits up to 100 milliseconds for certain applications
- 18.5.3.2\* A The maximum light pulse duration shall be ~~0.2 second~~ **20 milliseconds** with a maximum duty cycle of 40 percent.

Exception: Lights used to meet the requirements of 18.5.5.5 shall be permitted to be listed and labeled to have pulse durations up to 100 milliseconds.



# NFPA 72-2016 Changes

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## Major Changes – Chapter 21 Emergency Control Function Interfaces

- Revised 21.2.6 to permit emergency control function interface devices to be interfaced with fire alarm and signaling systems with Class N designated pathways
- Revised Section 21.3 to align elevator Phase I Emergency Recall Operation requirements and terminology with ANSI/ASME A17.1/CSA B44, *Safety Code for Elevators and Escalators*

21.3\* ~~Elevator Recall for Fire Fighters' Service.~~ Elevator Phase I Emergency Recall Operation.

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# NFPA 72-2016 Changes

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## Major Changes – Chapter 21 Emergency Control Function Interfaces

- Revised Section 21.5 to align Fire Service Access Elevator requirements and terminology with ANSI/ASME A17.1/CSA B44
- Added an exception in 21.8.3 to permit door and shutter hold-open release and integral door and shutter release and closure devices used for release service connected to Class D pathways to not be required to be monitored for integrity



# NFPA 72-2016 Changes

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## Major Changes – Chapter 23 Protected Premises Fire Alarm Systems

- 23.6 Performance of Signaling Line Circuits (SLCs).
- The assignment of class designations to signaling line circuits shall be based on their performance capabilities under abnormal (fault) conditions in accordance with the requirements for Class A, Class B, Class N, or Class X pathways specified in Chapter 12.

# NFPA 72-2016 Changes

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## Major Changes – Chapter 23 Protected Premises Fire Alarm Systems

- Added 23.6.1, introducing the concept of signaling line circuit (SLC) zones and the requirements associated with not permitting a single fault on the SLC to cause the loss of devices in more than one zone

### 23.6.1\* SLC Zones.

A single fault on a pathway connected to the addressable devices shall not cause the loss of the devices in more than ~~50 addressable devices~~ one zone.

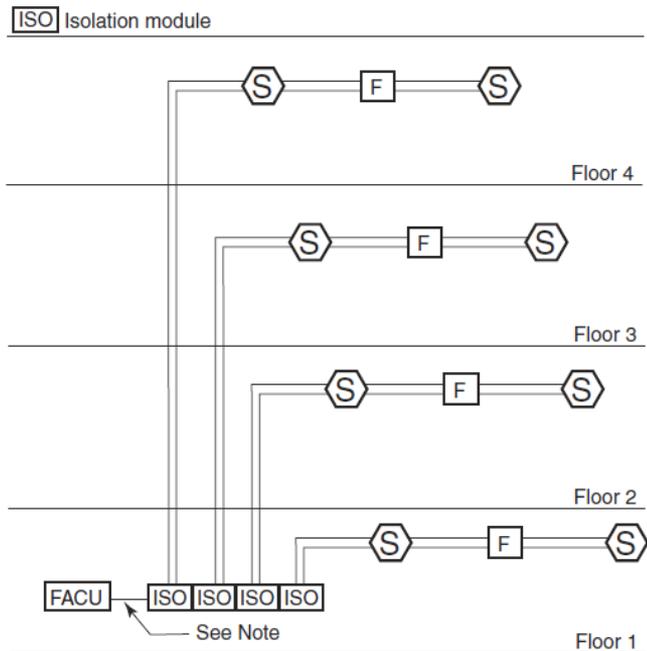
#### 23.6.1.1 each floor

#### 23.6.1.2 multiple zones per floor

#### 23.6.1.3 exception (1) and (2)

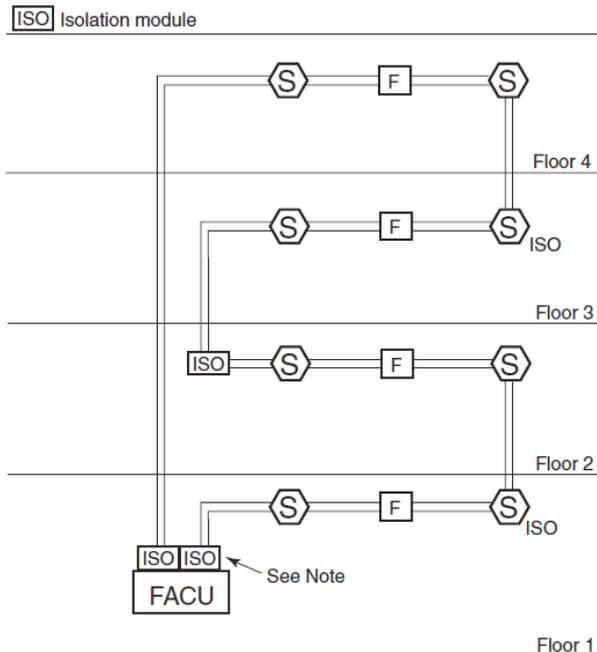


# NFPA 72-2016 Changes



Note: Paragraph 23.6.1.3(2) allows an un-isolated circuit in metallic raceway or other equivalently protected method that does not exceed 3 ft (1 m) in length.

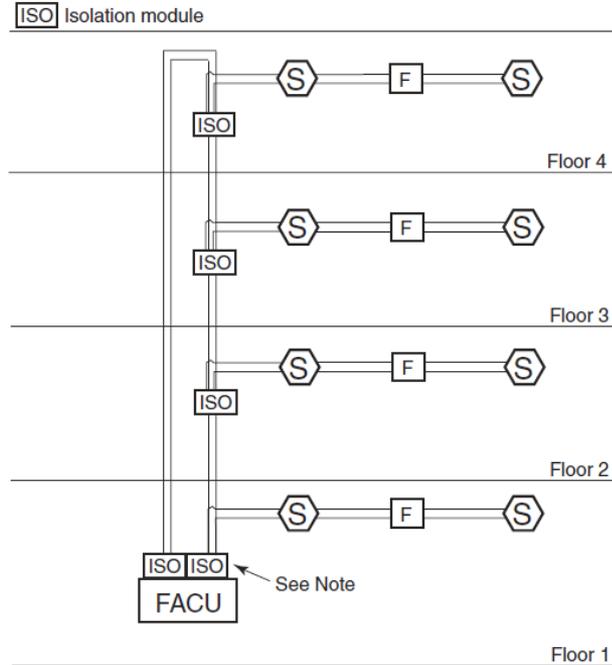
# NFPA 72-2016 Changes



Note: The two isolation modules shown at the FACP are not required if the panel SLC controller is internally isolated from shorts between outgoing and return termination points.

FIGURE A.23.6.1(b) Class A Isolation Method.

# NFPA 72-2016 Changes



Note: The two isolation modules shown at the FACP are not required if the panel SLC controller is internally isolated from shorts between outgoing and return termination points.

# NFPA 72-2016 Changes

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## Major Changes – Chapter 23 Protected Premises Fire Alarm Systems

- A.23.6.1 23.6.1 applies to both short-circuit faults and open-circuit faults.
- A single zone could be designated in the following ways:
  1. By floor where an SLC would not span multiple floors
  2. By floor area, where a large floor would be split into multiple zones based on a maximum floor area size (e.g., 22,500 ft<sup>2</sup>)
  3. By fire barrier or smoke barrier compartment boundaries, which an SLC would not cross
  4. By maximum length or circuit, where an SLC would not be longer than a predetermined length (e.g., 300 ft)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 23 Protected Premises Fire Alarm Systems

- Added 23.6.2 and 23.6.3, introducing Class N devices and Class N shared pathways
- Removed the repeated requirement for the 10-second actuation time of notification appliances at the protected premises after the activation of initiating devices
- (Continued on next slide)

# NFPA 72-2016 Changes

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## Major Changes – Chapter 23 Protected Premises Fire Alarm Systems

- Revised 23.8.2.7 and added 23.8.2.7.1, 23.8.2.7.2, 23.8.2.7.3, and 23.8.2.7.4, further defining the signals annunciated on interconnected fire alarm control units (FACUs)
- Added 23.8.2.9.1, 23.8.2.9.2, and 23.8.2.9.3, defining resetting procedures for interconnected FACUs
- Revised 23.8.5.6.3, further defining the requirement for valves installed between a sprinkler system and an initiating device and the annunciation of a supervisory signal at the FACU
- (Continued on next slide)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 23 Protected Premises Fire Alarm Systems

- Revised Section 23.16 to update terminology, device low battery monitoring, and response time
- 23.16\* Special Requirements for Low-Power Radio (Wireless) Systems.
- 23.16.2\* Power Supplies
  - (1) transmitter/transceiver
  - (2) transmitter/transceiver and its associated device
  - (3) transmitter/transceiver
  - (4) ~~at its receiver/fire alarm~~ transceiver at the system
  - (5) transmitter/transceiver

# NFPA 72-2016 Changes

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## Major Changes – Chapter 24 Emergency Communications Systems (ECS)

- Eliminated duplicate documentation requirements for risk analysis and evaluation as well as for one-way and two-way ECS and MNS (Chapter 7 is the central location for all documentation requirements)
- Added 24.3.1.2 permitting nonlisted speakers to be installed to achieve the performance requirements of intelligibility
- Added requirements in 24.3.5.4 regarding the use of Class N pathways with ECS
- Revised 24.3.6 to provide additional requirements for message development
- (Continued on next slide)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 24 Emergency Communications Systems (ECS)

- 24.3.10\* Control Unit Listing for Mass Notification Systems.

~~Listing.~~ Control units installed as part of a mass notification system shall be in compliance with this Code and at least one of the following applicable standards: ~~such as ANSI/UL 864, Standard for Control Units and Accessories for Fire Alarm Systems; ANSI/UL 2017, Standard for General-Purpose Signaling Devices and Systems; or ANSI/UL 2572, Mass Notification Systems.~~

- (1) ANSI/UL 864, Standard for Control Units and Accessories for Fire Alarm Systems
- (2) ANSI/UL 2017, Standard for General-Purpose Signaling Devices and Systems
- (3) ANSI/UL 2572, Mass Notification Systems.



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# NFPA 72-2016 Changes

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## Major Changes – Chapter 24 Emergency Communications Systems (ECS)

- Expanded risk analysis in 24.3.11
- Added new criteria in 24.3.13 regarding pathway survivability requirements
  - 24.3.13.4.1 For systems employing relocation or partial evacuation, a Level 2 or Level 3 pathway survivability shall be required.

Exception No. 1: Level 1 shall be permitted where notification or evacuation zones are separated by less than 2-hour fire-rated construction.

Exception No. 2: Level 1 shall be permitted where there are at least two pathways provided that are separated by at least one-third the maximum diagonal of the notification or evacuation signaling zones that the pathways are passing through and the pathway is Class X or Class N.



# NFPA 72-2016 Changes

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## Major Changes – Chapter 24 Emergency Communications Systems (ECS)

- Added new requirements in 24.5.14 for mounting of local operator console (LOC) controls
- Transferred the requirements for two-way radio voice communications enhancement systems to NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*
- (Continued on next slide)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 24 Emergency Communications Systems (ECS)

- 24.10\* Area of Refuge (Area of Rescue Assistance) Emergency Communications Systems.
- 24.10.3 The remote area of refuge stations and the central control point shall communicate with each other via pathways based on their performance capabilities under abnormal (fault) conditions in accordance with the requirements for Class A, Class B, Class N, or Class X pathways specified in Chapter 12.
- 24.10.4 All pathways between a remote area of refuge stations and the central control point shall be monitored for integrity.



# NFPA 72-2016 Changes

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## Major Changes – Chapter 24 Emergency Communications Systems (ECS)

- 24.12\* Stairway Communications Systems.



# NFPA 72-2016 Changes

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## Major Changes – Chapter 26 Supervising Station Alarm Systems

- Added new language in 26.2.1.3 and 26.2.1.4 clarifying that specific zone or point identification signal information received at the supervising station must be retransmitted to the communications center.
- Removed language that permitted alarm signal preverification while maintaining — but clarifying the permitted time frame allowed for — alarm signal verification in 26.2.2.1
- Deleted a long-standing provision from 26.6.1.1 that permitted transmission channels owned by, and under the control of, a protected premises owner to be exempted from the requirements of Section 26.6



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# NFPA 72-2016 Changes

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## Major Changes – Chapter 26 Supervising Station Alarm Systems

- Added new language to 26.6.3.4(3), which mandates that when multiple communication paths are used for performance-based technologies, they must be arranged to avoid a single point of failure
- Simplified the secondary power requirement language in 26.6.3.13.1 to indicate that any performance-based transmitters and shared equipment must be provided with the same secondary power requirement options which are 24 hours or as permitted by 10.6.7.3.1(2)
- Revised 26.6.4.1.5(1) requiring that the two transmission means for a digital alarm communicator transmitter (DACT) must also be separated to avoid a single occurrence affecting both circuits



# NFPA 72-2016 Changes

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## Major Changes – Chapter 27 Public Emergency Alarm Reporting Systems

- Moved the requirements of 27.3.7 on personnel qualifications to 10.5.6
- Expanded 27.5.3 for remote communications center to provide requirements for pathways, alarm and trouble signals, and operation during pathway failure
- Expanded Section 27.8 to establish requirements for when a public emergency alarm reporting system is also used as the infrastructure for an emergency communications system (ECS)

# NFPA 72-2016 Changes

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## Major Changes – Chapter 29 Single- and Multiple-Station Alarms and Household Fire Alarm Systems

- Added an exception to 29.3.5 to permit mechanically powered single-station heat alarms used as supplementary devices to not be required to produce the emergency evacuation signal described in ANSI S3.41, *American National Standard Audible Emergency Evacuation Signal*. The revision correlates with the exception in 29.5.2.1.1 for the use of mechanically operated heat alarms
- Revised 29.6.1 to establish that smoke and heat alarms must meet 29.5.2.1.1 to reinforce the requirement that smoke and heat alarms be interconnected while also meeting the various power requirement alternatives
- (Continued on next slide)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 29 Single- and Multiple-Station Alarms and Household Fire Alarm Systems

- Added requirements to 29.7.6. Paragraph 29.7.6.8 ensures that remote access data exchange would not compromise the integrity of the fire alarm system. Paragraph 29.7.6.9 inhibits remote resetting and silencing of a fire alarm control unit from other than the protected premises for a minimum of 4 minutes from the initial activation of the fire alarm signal
- Added a new requirement in 29.7.8.1, due to new changes in 23.16.4 for fire alarm systems
- (Continued on next slide)



# NFPA 72-2016 Changes

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## Major Changes – Chapter 29 Single- and Multiple-Station Alarms and Household Fire Alarm Systems

- Paragraph 29.7.8.1.1 leaves the existing monitoring for integrity (supervision) requirements of household fire alarm systems utilizing low-power radio (wireless) transmitters unchanged from that in the 2010 edition and in effect prior to June 2013. An 80-minute check-in requirement ensures at least 3 polling attempts in 4 hours
- Added new requirement 29.7.9.1.3.2 establishing that, where a communication or transmission means other than DACT is used, all equipment necessary to transmit an alarm signal must be provided with a minimum of 24 hours of secondary power capacity and report a trouble condition indicating loss of primary power



# NFPA 72-2016 Changes

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## Major Changes – Chapter 29 Single- and Multiple-Station Alarms and Household Fire Alarm Systems

- 29.8.3.4 Specific Location Requirements.

The installation of smoke alarms and smoke detectors shall comply with the following requirements:

(5) Effective January 1, ~~2016~~ 2019, smoke alarms and smoke detectors used in household fire alarm systems installed between 6 ft (1.8 m) and 20 ft (6.1 m) along a horizontal flow path from a stationary or fixed cooking appliance shall be listed for resistance to common nuisance sources from cooking.





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# Questions



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# Thank You