Second Revision No. 5032-NFPA 72-2020 [Section No. 3.3.252]

3.3.253* Remote Access.

Communications between a remote device and a component of a fire alarm or signaling system. ~~control unit.~~ (SIG-PRO)

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 17 15:03:17 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text because a remote device, such as a hand-held tablet or phone, can be used inside the protected premises and is therefore, not necessarily remote. The TC deletes “control unit” for clarity.

Response Message: SR-5032-NFPA 72-2020

Public Comment No. 103-NFPA 72-2020 [Section No. 3.3.252]

Second Revision No. 5033-NFPA 72-2020 [Section No. 12.1.2]

12.1.2

The requirements of Chapters 11 and 14 shall apply.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 17 15:31:02 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text as Chapter 11 should apply to circuits and pathways because they are vulnerable to tampering. The Technical Committee agrees with the submitter's substantiation.

Response Message: SR-5033-NFPA 72-2020

Public Comment No. 116-NFPA 72-2020 [Section No. 12.1.2]

Public Comment No. 183-NFPA 72-2020 [Section No. 12.1]

Second Revision No. 5034-NFPA 72-2020 [Section No. 12.2.1]

12.2.1*

Performance and ~~pathway~~ survivability of signaling pathways (interconnections) shall comply with the defined designations of this chapter.

Submitter Information Verification

Committee: SIG-PRO
Submittal Date: Wed Jun 17 15:32:57 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text as "pathway" should not be in the sentence twice.
Response Message: SR-5034-NFPA 72-2020

Public Comment No. 182-NFPA 72-2020 [Section No. 12.2.1]

Second Revision No. 5035-NFPA 72-2020 [Section No. 12.2.3.1]

12.2.3.1

Optical fiber cables installed as part of the fire alarm system shall meet the requirements of *NFPA 70* Article 770, and be protected against physical damage in accordance with *NFPA 70* Article 760.

12.2.3.2

Optical fiber cables entering from outside the building or structure shall also comply with *NFPA 70* Article 840.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 17 15:39:35 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text for conformity with the NFPA Manual of Style. The Technical Committee correlates the term optical fiber cables with the NEC.

Response Message: SR-5035-NFPA 72-2020

Public Comment No. 84-NFPA 72-2020 [Section No. 12.2.3.1]

Second Revision No. 5153-NFPA 72-2020 [Section No. 12.3.8]

12.3.8* Class A, Class N, and Class X Pathway Separation.

Class A, Class N, and Class X circuits using physical ~~conductors (e.g., metallic, optical fiber)~~ pathways shall be installed so that the primary and redundant, or outgoing and return, conductors exiting from and returning to the control unit, respectively, are routed separately.

A.12.3.8

A goal of 12.3.8 is to provide adequate separation between the outgoing and return cables. This separation is required to help ensure protection of the cables from physical damage. The recommended minimum separation to prevent physical damage is 12 in. (300 mm) where the cable is installed vertically and 48 in. (1.22 m) where the cable is installed horizontally.

Examples of physical pathways could include metallic conductors and optical fiber cables.

12.3.8.1

The outgoing and return (redundant) circuit conductors shall be permitted in the same cable assembly (i.e., multiconductor cable), enclosure, or raceway only under the following conditions:

(1) For a distance not to exceed 10 ft (3.0 m) where the outgoing and return conductors enter or exit the initiating device, notification appliance, or control unit enclosures

(2) Single drops installed in the raceway to individual devices or appliances

(3)* In a single room not exceeding 1000 ft^2 (93 m^2) in area, a drop installed in the raceway to multiple devices or appliances that does not include any emergency control function devices

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jul 15 22:46:20 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text as pathways can be either metallic or optical fiber. The TC includes Annex text to provide examples of physical pathways.

Response Message: SR-5153-NFPA 72-2020

Public Comment No. 85-NFPA 72-2020 [Section No. 12.3.8 [Excluding any Sub-Sections]]

Second Revision No. 5051-NFPA 72-2020 [Section No. 12.4.5]

12.4.5* Pathway Survivability Level 4.

Pathway survivability Level 4 shall consist of ~~pathways in buildings that are fully protected by an automatic sprinkler system in accordance with~~ NFPA 13 ~~, automatic smoke detection in areas where the vertical or horizontal backbone is installed, and~~ one or more of the following:

(1) 1-hour fire-rated circuit integrity (CI) or fire-resistive cable

(2) 1-hour fire-rated cable system [electrical circuit protective system(s)]

(3) 1-hour fire-rated enclosure or protected area

(4) Performance alternatives approved by the authority having jurisdiction

A.12.4.5

As identified in A.12.4 and Table A.12.4 , pathways are not ranked in a hierarchy of protection. As such, a Level 4 is not intended to be better than a Level 1. Rather, each provides a separate means of achieving an acceptable level of protection based on system performance and construction. Nonsprinklered buildings having less than 2-hour construction – such as a single-story nursing facility – might incorporate partial evacuation or relocation of occupants upon fire alarm signal activation. The provisions of a pathway survivability Level 4 might be appropriate for the fire alarm or signaling system installed in such facility. Figure A.24.3.14.4.6.3 provides examples of how a user might use various options within a multistory building to achieve an intended level of protection. These provisions might include 1-hour separations, separation by ⅓ diagonal of the area, Class N or Class X pathways, fire-rated enclosures, or other means of protection. Additional explanatory material related to pathway survivability use is provided in A.24.3.14.4.2 through A.24.3.14.4.4 , A.24.3.14.4.6.1 through A.24.3.14.4.6.4 , A.24.3.14.9 , and A.24.3.14.12.1 .

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 10:16:32 EDT 2020

Committee Statement

Committee Statement: Level 4 survivability is intended for buildings that are not sprinklered or provided with smoke protection but have separation by fire rated construction.

Item 1) was revised to include a 1-hour circuit integrity or fire-resistive cable for consistency with other levels of survivability. The annex material was added to clarify Level 4 survivability and where it could be used. The new annex material also points to other annex material, which discusses additional options and provides further clarification on its use.

Response Message: SR-5051-NFPA 72-2020

Public Comment No. 153-NFPA 72-2020 [Section No. 12.4.5]

Second Revision No. 5053-NFPA 72-2020 [Section No. 12.6.6]

12.6.6

Monitoring for integrity shall not be required for the circuit of an alarm notification appliance installed in the same room with the control ~~unit~~ equipment , provided that the notification appliance circuit conductors are installed in conduit or are equivalently protected against mechanical injury.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 10:52:40 EDT 2020

Committee Statement

Committee Statement: The Technical Committee accepts direction from the Correlating Committee and revises the text from control unit" to "control equipment."

Response Message: SR-5053-NFPA 72-2020

Public Comment No. 184-NFPA 72-2020 [Section No. 12.6.6]

Second Revision No. 5188-NFPA 72-2020 [Section No. 21.1 [Excluding any Sub-Sections]]

The provisions of Chapter 21 shall cover the minimum requirements and methods for emergency control function interfaces ~~to~~ with fire alarm ~~and~~ or signaling systems in accordance with this chapter.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Mon Aug 10 15:30:53 EDT 2020

Committee Statement

Committee Statement: A signaling system does not have to be combined with a FA system therefore the Technical Committee changes “to” to “with” and “and” to “or.”

The Technical Committee changes the term “Interface with” (appears 12 times in the Code) instead of “interface to” (appears 4 times in the Code) for consistency and clarity.

Response Message: SR-5188-NFPA 72-2020

Public Comment No. 308-NFPA 72-2020 [Section No. 21.1 [Excluding any Sub-Sections]]

Second Revision No. 5081-NFPA 72-2020 [Section No. 21.1.1]

21.1.1

The requirements of Chapters 7, 10, 11 , 12, 14, 17, 18, 23, 24, and 26 shall apply, unless otherwise noted in this chapter.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 24 10:58:26 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text as Chapter 11 should apply to Chapter 21. The Technical Committee agrees with the submitter's substantiation.

Response Message: SR-5081-NFPA 72-2020

Public Comment No. 123-NFPA 72-2020 [Section No. 21.1.1]

Public Comment No. 307-NFPA 72-2020 [Section No. 21.1]

Second Revision No. 5047-NFPA 72-2020 [Section No. 21.6.2.4.4]

21.6.2.4.4

When OEO is in effect and a manual floor selection is made, the elevator evacuation zone shall be permitted by the authority having jurisdiction to be expanded as described in 21.6.2.3.4 or by adding that floor to the evacuation zone .

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Thu Jun 18 15:03:36 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text to be permissive allowing the AHJ to accept either option.

Response Message: SR-5047-NFPA 72-2020

Public Comment No. 234-NFPA 72-2020 [Section No. 21.6.2.4.4]

Second Revision No. 5048-NFPA 72-2020 [Section No. 21.6.2.6.4 [Excluding any Sub-Sections]]

Where required by ~~the building code,~~ other governing laws, codes, or standards, the emergency voice/alarm communications system's loudspeaker(s) located in each OEE lobby shall be connected to a separate notification zone for manual paging only.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Thu Jun 18 15:52:45 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text to utilize the same standard language used elsewhere in the Code.

Response Message: SR-5048-NFPA 72-2020

Public Comment No. 290-NFPA 72-2020 [Section No. 21.6.2.6.4 [Excluding any Sub-Sections]]

Second Revision No. 5054-NFPA 72-2020 [Section No. 23.1.2]

23.1.2

The requirements of Chapters 7, 10, 11 , 12, 14, 17, 18, 21, 24, and 26 shall apply unless otherwise noted in this chapter.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 11:12:27 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text as Chapter 11 should apply to Chapter 23. The Technical Committee agrees with the submitter's substantiation.

Response Message: SR-5054-NFPA 72-2020

Public Comment No. 124-NFPA 72-2020 [Section No. 23.1.2]

Public Comment No. 319-NFPA 72-2020 [Section No. 23.1]

Second Revision No. 5056-NFPA 72-2020 [Section No. 23.6.2.2]

23.6.2.2

Multiple devices shall not be required in areas served by pathways not susceptible to ground faults, such as optical fiber cable or wireless pathways.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 11:35:23 EDT 2020

Committee Statement

Committee Statement: The Technical Committee accepts the text change as it provides consistency in optical fiber terminology.

Response Message: SR-5056-NFPA 72-2020

Public Comment No. 89-NFPA 72-2020 [Section No. 23.6.2.2]

Second Revision No. 5107-NFPA 72-2020 [Section No. 23.6.3.6.2]

23.6.3.6.2*

The analysis shall determine and document the power distribution capability as follows:

(1) The methods provided to maintain power to all shared pathway equipment

(2)* A calculation of power requirements of all connected equipment

A.23.6.3.6.2(2)

Where Class N networks incorporate power over communications cables, outputs are rated based on various systems. Section 725.144 of *NFPA 70* limits the number of 4-pair cables that can be bundled based on the current provided by the power source for these systems. The current rating marked on the power source equipment as required by 725.121(C) of *NFPA 70* for the outputs can be used to apply the requirements of 725.144 of *NFPA 70.*

One of the more common systems uses Power over Ethernet (PoE) technology standardized in IEEE 802.3bt, *IEEE Standard for Ethernet Amendment 2: Physical Layer and Management Parameters for Power over Ethernet over 4 pairs* . The information in Table A.23.6.3.6.2(2) shows allowable bundle sizes. It is derived from Table 725.144 of *NFPA 70* but temperature adjusted to 120°F (49°C) ambient as required by 10.3.5 of this Code.

Currently IEEE 802.3bt recognizes four PoE Types (Types 1 through 4). Each Type establishes a maximum power limit as supplied by the power sourcing equipment (PSE), commonly a PoE switch. Type 1 is limited to 15.4 W, Type 2 to 30 W, Type 3 to 60 W, and Type 4 to 90 W.

Table A.23.6.3.6.2(2) *NFPA 70* Cable Bundle Table 725.144 Viewed from a PoE Type Perspective

24 AWG: Number of 4-Pair Cables in a Bundle Corrected to 120°F (49°C), per Table 310.15(B)(1) of *NFPA 70*

	1–7			8–19			20–37			38–61			62–91			92–192		
	Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating		
IEEE 802.3bt Type Classification	60	75	90	60	75	90	60	75	90	60	75	90	60	75	90	60	75	90
Type 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes*	Yes	Yes
Type 4	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes

23 AWG: Number of 4-Pair Cables in a Bundle Corrected to 120°F (49°C), per Table 310.15(B)(1) of *NFPA 70*

	1–7			8–19			20–37			38–61			62–91			92–192		
	Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating		
IEEE 802.3bt Type Classification	60	75	90	60	75	90	60	75	90	60	75	90	60	75	90	60	75	90
Type 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes
Type 4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	No	Yes

22 AWG: Number of 4-Pair Cables in a Bundle Corrected to 120°F (49°C), per Table 310.15(B)(1) of *NFPA 70*

	1–7	8–19	20–37	38–61	62–91	92–192
	Temperature Rating	Temperature Rating	Temperature Rating	Temperature Rating	Temperature Rating	Temperature Rating

24 AWG: Number of 4-Pair Cables in a Bundle Corrected to 120°F (49°C), per Table 310.15(B)(1) of *NFPA 70*

	1–7			8–19			20–37			38–61			62–91			92–192		
	Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating		
IEEE 802.3bt Type Classification	60	75	90	60	75	90	60	75	90	60	75	90	60	75	90	60	75	90
Type 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type 4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes

Notes:

1. “Yes” indicates that the bundle size of the gauge and temperature cable is permitted for the IEEE Class in the leftmost column per *NFPA 70.* “No” designates bundle sizes that are not permitted.

2. IEEE 208.3bt: The PoE maximum permitted average current per conductor: Type 1: 175 mA, Type 2/3: 300 mA, Type 4: 433 mA.

*Section 725.144 (A) exception of *NFPA 70* for currents of not more than 300 mA for conductors 24 AWG or greater is applied for Types 1, 2, and 3.

(3) Secondary power capacities provided to maintain all life safety equipment with minimum operational capacity in accordance with 10.6.7.2.3

(4) Methods to disengage any non–life safety equipment in the event of emergency operation if required to support the minimum operational capacity requirements

Supplemental Information

File Name	Description	Approved
NEC_725_144_RJR.xlsx	for staff use	

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Mon Jun 29 13:32:36 EDT 2020

Committee Statement

Committee Statement: The TC adds new annex material to assist in proper application of section 23.6.3.6.2 (2) for compliance with 725.144 of the NEC.

Response Message: SR-5107-NFPA 72-2020

Public Comment No. 289-NFPA 72-2020 [Section No. A.23.6.3.6.2]

Second Revision No. 5082-NFPA 72-2020 [Section No. 23.6.3.8.9]

~~23.6.3.8.9~~

~~The risk analysis shall consider cybersecurity risks in accordance with Chapter 11 .~~

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 24 11:28:41 EDT 2020

Committee Statement

Committee Statement: The Technical Committee deletes 23.6.3.8.9 to correlate with actions taken on Public Comment 124.

Response Message: SR-5082-NFPA 72-2020

Second Revision No. 5059-NFPA 72-2020 [Section No. 23.8.1.2.1.1]

23.8.1.2.1.1

The positive alarm sequence operation shall comply with the following:

(1) To initiate the positive alarm sequence operation, unless otherwise permitted by 23.8.1.2.1.3 , the signal from an automatic fire detection device selected for positive alarm sequence operation shall be acknowledged at the fire alarm control unit by qualified personnel within 15 seconds of annunciation.

(2) 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 actuated.

(3) If the positive alarm sequence operation is initiated in accordance with 23.8.1.2.1.1(1), qualified personnel shall have an alarm investigation phase of up to 180 seconds to evaluate the fire condition and reset the system.

(4) If the system is not reset during the alarm investigation phase, notification signals in accordance with the building evacuation or relocation plan and remote signals shall be automatically and immediately actuated.

(5) If a second automatic fire detector selected for positive alarm sequence is actuated during the alarm investigation phase, notification signals in accordance with the building evacuation or relocation plan and remote signals shall be automatically and immediately actuated.

(6)* If any other fire alarm initiating device is actuated, notification signals in accordance with the building evacuation or relocation plan and remote signals shall be automatically and immediately actuated.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 12:16:15 EDT 2020

Committee Statement

Committee Statement: The Technical Committee adds language to eliminate the conflict between this section and 23.8.1.2.1.3.

Response Message: SR-5059-NFPA 72-2020

Public Comment No. 125-NFPA 72-2020 [Section No. 23.8.1.2.1.1]

Second Revision No. 5189-NFPA 72-2020 [Section No. 23.8.2.7.4]

23.8.2.7.4*

Where supervised pathways between interconnected fire alarm control units is not achievable, a supervised annunciator shall be installed adjacent to control unit(s) to annunciate the status of ~~the~~ each control unit.

Submitter Information Verification

Committee: SIG-PRO
Submittal Date: Mon Aug 24 11:39:57 EDT 2020

Committee Statement

Committee Statement: The Technical Committee deletes "the" as it is not required.
Response Message: SR-5189-NFPA 72-2020

Second Revision No. 5095-NFPA 72-2020 [Section No. 23.8.2.11]

23.8.2.11 Remote Access.

23.8.2.11.1*

Remote access to fire alarm ~~and~~ or signaling systems ~~control units~~ shall be permitted in accordance with ~~this section~~ 23.8.2.11 .

A.23.8.2.11.1

Remote access is achieved by, but not limited to, the use of cellular technology, internet-based technology, or radio frequency technology. Paragraph 23.8.2.11 is intended to address the following activities: testing, maintenance, diagnostics, and software upgrade performed through remote access.

23.8.2.11.2

Remote access shall not affect the operation or response of the fire alarm or signaling systems ~~control unit~~ unless permitted by 23.8.2.11.3 or 23.8.2.11.5 .

23.8.2.11.3

~~Resetting~~ Remote access shall be permitted for testing and maintenance activities, including resetting , silencing, or operation of emergency control functions ~~shall not be permitted when remotely accessing fire alarm or signaling systems unless otherwise permitted by the authority having jurisdiction.~~ provided all of the following are met:

(1)* The system shall provide a means to manually terminate the remote access connection at the remote device and at the fire alarm or signaling system control unit at any time.

A.23.8.2.11.3(1)

It is the intent to require two separate means of manually terminating the remote access connection with one of them being performed at the system control unit by a person on-site.

(2)* Remote access shall be automatically terminated within a maximum of 1 hour of inactivity in the remote access mode.

A.23.8.2.11.3(2)

It is the intent that the remote connection be automatically terminated upon no activity or changes being performed for a period of one hour. The inactivity limitation of one hour is used as a reasonable time period.

(3) Resetting, silencing, or operation of emergency control functions shall be limited to portion(s) of the system taken out of service.

(4) Qualified personnel shall be on-site to enable resetting, silencing, and operation of emergency control functions at the affected system(s) by password or limited access.

23.8.2.11.4*

Remote access shall be permitted to be enabled remotely for the purposes of performing remote diagnostics~~, maintenance, and testing~~ when both of the following are met:

(1)* ~~Remote access connections shall be permitted to be exited manually at any time.~~ The system shall provide a means to manually terminate the remote access connection at the remote device and at the fire alarm or signaling system control unit at any time.

A.23.8.2.11.4(1)

It is the intent to require two separate means of manually terminating the remote access connection with one of them being performed at the system control unit by a person on-site.

(2)* Remote access shall be automatically ~~exited~~ terminated within ~~4 hours~~ a maximum of 1 hour of inactivity in the remote access mode .

A.23.8.2.11.4(2)

It is the intent that the remote connection be automatically terminated upon no activity or changes being performed for a period of one hour. The inactivity limitation of one hour is used as a reasonable time period.

A.23.8.2.11.4

Remote diagnostics involves queries of the system and does not involve changing the system. ~~status, programming, or functionality.~~

23.8.2.11.5

Remote access for the purposes of software updating ~~or remote access testing~~ shall be permitted ~~only where qualified personnel are on-site and authorize the software change or remote access testing at the affected control unit.~~ when all of the following are met:

(1)* The system shall provide a means to manually terminate the remote access connection at the remote device and at the fire alarm or signaling system control unit at any time.

A.23.8.2.11.5(1)

It is the intent to require two separate means of manually terminating the remote access connection with one of them being performed at the system control unit by a person on-site.

(2)* Remote access shall be automatically terminated within a maximum of 1 hour of inactivity in the remote access mode.

A.23.8.2.11.5(2)

It is the intent that the remote connection be automatically terminated upon no activity or changes being performed for a period of one hour. The inactivity limitation of one hour is used as a reasonable time period.

(3) Qualified personnel shall be on-site to enable software updating at the affected fire alarm or signaling system control unit by password or limited access.

(4) All software changes shall be tested in accordance with Section 14.4 .

~~**23.8.2.11.5.1**~~

~~Remote access for the purposes of 23.8.2.11.5 shall be protected at the affected control unit by password or limited access.~~

~~**23.8.2.11.5.2**~~

~~All software changes shall be tested in accordance with Section 14.4 .~~

Supplemental Information

File Name	Description	Approved
6_PC-126_FR_5095_RJR.docx	Attached Word doc is provided for clarity. The lists really make it complicated because everything looks like new text and it is not. For staff use	

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Thu Jun 25 11:48:37 EDT 2020

Committee Statement

Committee Statement: The Technical Committee accepts the submitter's text and edits as the TC is in support of allowing remote access, however, there are different limitations to be followed for testing and maintenance vs diagnostic vs software updates. The TC addresses the timeout feature and changes 4 hours to 1 hour with inactivity qualifiers. Remote access cybersecurity requirements and limitations are being addressed by SIG-FUN and SIG-TMS and the Correlating Committee may need to correlate. Additional annex material was also added to clarify some of the paragraphs in this section.

Response Message: SR-5095-NFPA 72-2020

Public Comment No. 126-NFPA 72-2020 [Section No. 23.8.2.11]

Second Revision No. 5060-NFPA 72-2020 [Section No. 23.8.3.2]

23.8.3.2

The actuation of ~~dwelling unit~~ household warning equipment shall only be permitted to be displayed at the protected premises control unit and annunciators as supervisory signals.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 12:21:25 EDT 2020

Committee Statement

Committee Statement: The Technical Committee revises to “household warning equipment” because 29.2.1 and 29.2.2 refer to warning equipment and there is no mention of signaling equipment other than in the title of Chapter 29. “Dwelling unit” refers to the occupied space and not the equipment.

Response Message: SR-5060-NFPA 72-2020

Public Comment No. 291-NFPA 72-2020 [Section No. 23.8.3.2]

Second Revision No. 5061-NFPA 72-2020 [Section No. 23.8.3.3]

23.8.3.3

If interconnected, an alarm condition at the protected premises system shall cause the ~~alarm notification appliance(s) of the dwelling unit's~~ intended notification alarm signal of the household's warning equipment to become ~~energized~~ activated and remain ~~energized~~ activated until the protected premises system is silenced or reset.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 12:26:45 EDT 2020

Committee Statement

Committee Statement: The Technical Committee agrees with PC 127 which clarifies which alarm signal is being activated in the dwelling unit. For example, carbon monoxide alarms only activate carbon monoxide signals. In addition, the committee is revising "dwelling unit's warning equipment" to "household's warning equipment" to be consistent in reference to equipment in Chapter 29.

Response Message: SR-5061-NFPA 72-2020

Public Comment No. 127-NFPA 72-2020 [Section No. 23.8.3.3]

Second Revision No. 5062-NFPA 72-2020 [Section No. 23.8.3.4]

23.8.3.4

The interconnection circuit or path from the protected premises system to the ~~dwelling unit~~ household warning equipment shall be monitored for integrity by the protected premises system in accordance with Section 12.6.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 12:28:33 EDT 2020

Committee Statement

Committee Statement: The Technical Committee revises to “household warning equipment” because 29.2.1 and 29.2.2 refer to warning equipment and there is no mention of signaling equipment other than in the title of Chapter 29. “Dwelling unit” refers to the occupied space and not the equipment.

Response Message: SR-5062-NFPA 72-2020

Public Comment No. 293-NFPA 72-2020 [Section No. 23.8.3.4]

Second Revision No. 5063-NFPA 72-2020 [Section No. 23.8.3.5]

23.8.3.5

An alarm condition occurring at the ~~dwelling unit~~ household fire warning equipment or the operation of any test switches provided as part of the ~~dwelling unit~~ household warning equipment shall not cause an alarm condition at the protected premises system.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 12:30:15 EDT 2020

Committee Statement

Committee Statement: The Technical Committee revises to “household warning equipment” because 29.2.1 and 29.2.2 refer to warning equipment and there is no mention of signaling equipment other than in the title of Chapter 29. “Dwelling unit” refers to the occupied space and not the equipment.

Response Message: SR-5063-NFPA 72-2020

Public Comment No. 294-NFPA 72-2020 [Section No. 23.8.3.5]

Second Revision No. 5036-NFPA 72-2020 [Section No. A.12.2.4.3]

A.12.2.4.3

Technologies that do not use metallic conductors (e.g., wireless or ~~optical~~ fiber optics) are not affected by ground connections.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 17 15:42:47 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text to establish consistency throughout the document for the term fiber optics.

Response Message: SR-5036-NFPA 72-2020

Public Comment No. 95-NFPA 72-2020 [Section No. A.12.2.4.3]

Second Revision No. 5037-NFPA 72-2020 [Section No. A.12.3.6(1)]

A.12.3.6(1)

The Class N pathway designation is added to specifically address the use of modern network infrastructure when used in fire alarm ~~and emergency communication~~ or signaling systems.

Class N networks can be specified for ancillary functions but are not required for supplemental reporting described in 23.12.4. *[See Figure A.23.12.4.]*

Ethernet network devices are addressable but with an important distinction from device addresses on a traditional SLC multi-drop loop. A device with an Ethernet address is, in most cases, a physical endpoint connected to a dedicated cable. Traditional SLC devices are all wired on the same communication line (in parallel), similar to an old party-line telephone system. By comparison, Ethernet's network switches direct each data packet to its intended recipient device like our modern phone systems.

Class N uses redundant paths as a means to compensate for Ethernet wiring that does not report a single connection to ground, a basic requirement of Class B. Thus, the physical separation of Class A and Class X, and equipment redundancy described in 12.3.7, is not inherently required of Class N. In other words, failure of a single switch is permitted to take down a Class N segment and is only required to report the loss of communication. Where redundant path segments are intended to have survivability similar to Class A or Class X, the physical separation requirements and overall equipment redundancy must be specified in addition to the Class N designation.

As a visual model, Class N could be likened to a redundant pathway backbone, allowed to have Class C branch paths to single endpoint devices. Therefore, every effort is made in this section to clearly distinguish the single endpoint device from the transport equipment required to have redundant paths.

Class N requires redundant, monitored pathway segments to and from a control unit(s) where any interruption in communications could potentially affect multiple endpoint devices. Typically, interconnected communications equipment such as Ethernet switches, wireless repeaters, or media converters are used in combination to create pathways. Chapter 12 describes the required behavior of Class N pathways. All equipment must meet the requirements of other chapters in *NFPA 72* (such as, but not limited to, requirements pertaining to secondary power supplies, equipment listings, and environment conditions).

Redundant pathways, isolated from ground, are actually common practice in robust Ethernet designs. Managed network switches commonly have specific uplink ports that are intended for load sharing and allow two parallel connections. For compliance with Class N, a trouble must be reported if either of these connections fails. *[See Figure A.12.3.6(1)(a) and Figure A.12.3.6(1)(b).]*

Class N pathways can use metallic conductor communications cable, such as a 100 ohm balanced twisted pair (e.g., Category 5E), including single-pair or multi-pair cable, or other communications media, such as optical fiber~~-optic~~ cable or wireless transmission, or a combination of two or more such transport mediums.

Where a conductor-based media is used for Class N, the intention is not to monitor faults on individual conductors but rather to monitor the operational capability and performance of the pathway as a whole. Similar to Class C, end-to-end verification is used in Class N.

Primary and required redundant pathways are independently and continuously verified for their ability to support end-to-end communications to and from each endpoint device and its associated control equipment. Pathway segments that service more than one device must have at least one verified redundant pathway segment. Should any primary pathway segment fail, communication is supported by the redundant pathway segment(s). Failure of either a primary or redundant pathway will indicate a trouble.

Redundant pathway segments are generally independent and do not normally share media with the primary pathways. However, there are exceptions, such as different frequencies for wireless components or ring topologies. *[See Figure A.12.3.6(5).]*

A Class N network can be made more reliable with physically distinct pathway segments (i.e., an alternate conduit, or cable tray route, or wireless transmission frequency range, or a combination of distinct media). In addition to the required primary segments and redundant segments, a Class N pathway is permitted to have nonrequired segments. *[See Figure A.12.3.6(1)(c).]* Additional nonrequired pathway segments are allowed to be connected and not independently monitored for integrity as long as two paths are monitored to meet the redundancy requirement of Class N.

Figure A.12.3.6(1)(a) Class N Pathway Block Diagram – Example 1.

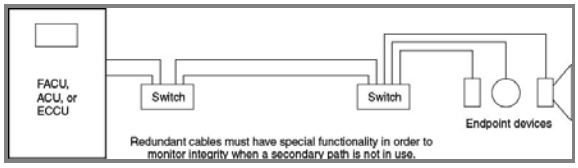
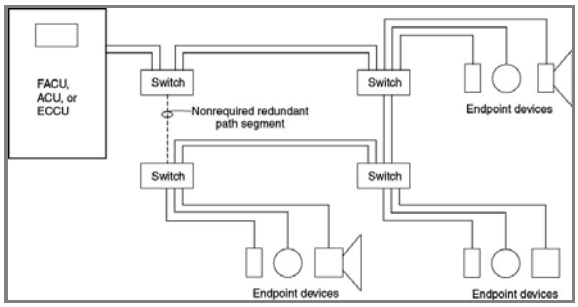


Figure A.12.3.6(1)(b) Class N Pathway Block Diagram – Example 2.



Traditionally, NFPA has used the word *device* for input components and the term *appliance* for components used in notification. With respect to Class N, the term *device* includes appliances and other intelligent, addressable components that perform a programmable input or output function. Examples of Class N devices include the following:

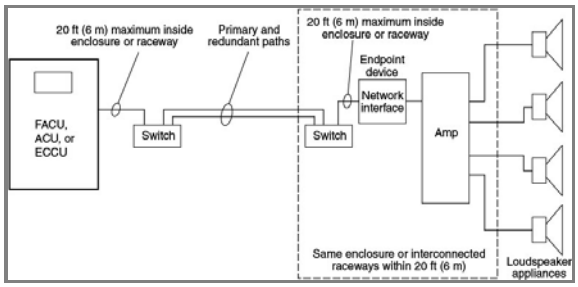
(1) Input components such as alarm initiating modules switches and sensors

(2) Output components such as output modules, Ethernet loudspeakers (i.e., IEEE 802.3 PoE loudspeakers), intelligent visual notification appliances (strobes), textual signage, and intelligent audio amplifiers

Transmission equipment components (e.g., media converters, Ethernet switches, patch panels, cross-connects) are connected to the Class N pathway merely to transport instructions between other equipment. As such, they are not considered devices with respect to Class N pathways.

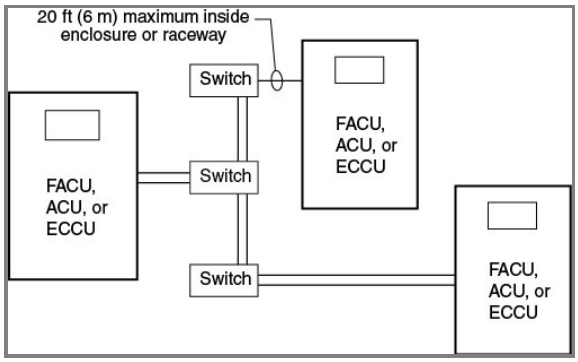
The audio amplifier listed above is an example of an addressable device that can receive a digital audio input from the Class N pathway and then provide a notification appliance circuit (NAC) output with Class A, B, or X pathways. Other endpoint devices can similarly provide alternate class pathways for visual notification appliances (strobes) (NACs) or initiating devices (IDCs). From the perspective of the Class N pathway, communications terminate at this endpoint device. However, since these types of endpoints can support multiple notification appliance devices or initiating devices, path segments are subject to the redundant pathway requirement unless protected in an enclosure or raceway less than 20 ft (6 m) in length. *(See 12.6.9.) [See Figure A.12.3.6(1)(c).]*

Figure A.12.3.6(1)(c) Class N Pathway to Endpoint with Multiple Devices.



Class N connections between control equipment are required to have redundant monitored pathway segments if a failure of a primary pathway segment in between control equipment could impair the operation of the control equipment. *[See Figure A.12.3.6(1)(d).]*

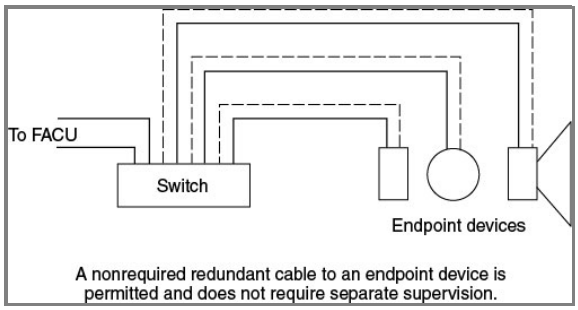
Figure A.12.3.6(1)(d) Class N Pathway Block Diagram with Multiple Control Units.



Class N is also permitted to include dual port devices that provide both transmission and input/output functions. Endpoint devices can have multiple connection ports and support dual pathway segment connections; thus the term *endpoint device* is not intended to prohibit more than one connection to a

device. Even with dual connections, where other devices depend on the path, primary and redundant paths are required. But, where an endpoint device has two connection ports, and when a secondary nonrequired connection is added, there is no requirement to separately supervise the nonrequired redundant pathway segment. *[See Figure A.12.3.6(1)(e).]*

Figure A.12.3.6(1)(e) Class N Pathway Block Diagram with Device with Dual Pathway Connection.



Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 17 16:09:49 EDT 2020

Committee Statement

Committee Statement: The Technical Committee accepts direction from the Correlating Committee and revises the text changing “and” to “or” in the 1st paragraph. The TC also changes emergency communication to signaling for consistency throughout the Code. The Technical Committee edits the text to establish consistency throughout the document for the term fiber optics.

Response Message: SR-5037-NFPA 72-2020

Public Comment No. 339-NFPA 72-2020 [Section No. A.12.3.6(1)]

Public Comment No. 96-NFPA 72-2020 [Section No. A.12.3.6(1)]

Second Revision No. 5052-NFPA 72-2020 [Section No. A.12.4]

A.12.4

The intent of the pathway survivability designation is to provide options for the protection of the pathway circuits as shown in Table A.12.4 and not to create a hierarchical ranking. Other chapters within *NFPA 72* or other code-making jurisdictions can select the survivability option that best meets their needs.

Table A.12.4 Performance Criteria Options for Pathway Survivability Levels

Required Performance Criteria	Pathway Survivability				
	Level 0 (12.4.1)	Level 1 (12.4.2)	Level 2 (12.4.3)	Level 3 (12.4.4)	Level 4 (12.4.5)
Per 12.2.3.3 and Section 12.4 of this Code, all pathways must comply with *NFPA 70* applicable requirements.	YES	YES	YES	YES	YES
Wiring methods permitted are installed in accordance with manufacturer's published instructions (12.2.3.3).	YES	YES	YES	YES	YES
Building is fully protected by an automatic sprinkler system in accordance with NFPA 13.	—	YES	—	YES	—
Any interconnecting conductors, cables, or other physical pathways are protected by metal raceways or metal armored cables.	—	YES	—	—	—
One or more of the following are required: (1) 1-hour fire-rated circuit integrity (CI) or fire-resistive cable (2) 1-hour fire-rated cable system [electrical circuit protective system(s)] (3) 1-hour fire-rated enclosure or protected area (4) Performance alternative approved by the AHJ	—	—	—	—	YES
One or more of the following are required: (1) 2-hour fire-rated circuit integrity (CI) or fire-resistive cable (2) 2-hour fire-rated cable system [electrical circuit protective system(s)] (3) 2-hour fire-rated enclosure or protected area (4) Performance alternative approved by the AHJ	—	—	YES	YES	—

Supplemental Information

File Name	Description	Approved
Table_A.12.4_-_PC_Submission-R1.1588782058916_RJR.xlsx	This is Table A..12.4. Disregard yellow highlight. For staff use	

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 10:49:07 EDT 2020

Committee Statement

Committee Statement: The Technical Committee includes the table to be consistent with 12.4.5.

Response Message: SR-5052-NFPA 72-2020

Public Comment No. 251-NFPA 72-2020 [Section No. A.12.4]

Second Revision No. 5050-NFPA 72-2020 [Section No. A.21.5]

A.21.5

The continuous monitoring of smoke and temperature is to allow the responding fire fighters to know when the tenability conditions at the floor elevator lobbies are changing. This can be accomplished at a minimum by monitoring elevator lobbies, machine rooms, control rooms, machinery spaces, or control spaces smoke detector(s) for the presence of smoke and a minimum of three ranges of temperature in the elevator lobbies, machine rooms, machinery spaces, or control rooms that provide full bodily access for fire fighters, as follows:

(1) Normal ≤90°F (32°C)

(2) Monitoring (supervisory) between 90°F (32°C) and 135°F (57°C)

(3) Unsafe (alarm) above 135°F (57°C)

Indications at the fire alarm control unit would typically be as follows:

For smoke:

(1) No indication for normal

(2) Red/alarm messaging or unsafe

For heat:

(1) Green (no indication on fire alarm control unit) for a normal range

(2) Amber/yellow/supervisory messaging for monitor range

(3) Red/alarm messaging for unsafe

Note 1: Temperature monitoring should not be required in areas or locations not accessible to fire fighters, such as elevator control spaces and elevator machinery spaces located inside the elevator hoistway.

Note 2: If fire service access elevators or occupant evacuation elevators are provided in buildings not provided with a fire command center or emergency command center , such as low-rise buildings, the required annunciator(s) should be installed in another approved location as determined by the authority having jurisdiction.

In most cases, a separate annunciator would be recommended to provide an overall status of the elevator lobbies, machine rooms, or control rooms that provide full bodily access for fire fighters in the building.

The lowest temperature defined in Table 17.6.2.1, Temperature Classification and Color Code for Heat-Sensing Fire Detectors, is 100°F (38°C), so a thermostat or other approved heat sensor(s) should be used to monitor temperatures less than 100°F (38°C).

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Thu Jun 18 16:11:46 EDT 2020

Committee Statement

Committee Statement: The Technical Committee edits the text to be consistent with other sections in the Code specifying FCC or ECC.

Response Message: SR-5050-NFPA 72-2020

Public Comment No. 344-NFPA 72-2020 [Section No. A.21.5]

Second Revision No. 5192-NFPA 72-2020 [Section No. A.21.10.1]

A.21.10.1

Doors are commonly locked for various security reasons. Though doors are permitted to be locked to prevent ingress, doors are generally not permitted to be locked to restrict egress unless specifically permitted by governing laws, codes, and standards. Examples of special locking arrangements include delayed egress locking and access control locking. Approved locking requirements by governing laws, codes, and standards can vary extensively. For example, some might require all fire alarm initiating devices to immediately unlock electrically locked egress doors, while others might permit such doors to remain locked when a single manual fire alarm box is ~~actuate~~ actuated . Some codes might also permit electrically locked doors to remain locked when a single smoke detector has actuated. These allowances are typically permitted only in sprinklered buildings and are generally used as additional safeguards to counter efforts to breach security, without compromising occupant safety.

Submitter Information Verification

Committee: SIG-PRO
Submittal Date: Mon Aug 24 14:50:19 EDT 2020

Committee Statement

Committee Statement: The Technical Committee changes actuate to actuated in the 4th sentence.
Response Message: SR-5192-NFPA 72-2020

Second Revision No. 5055-NFPA 72-2020 [Section No. A.23.6.2]

A.23.6.2

Class N systems should mitigate risk that could be present when a zone or area is serviced by a single Class N device. However, 23.6.2 is not intended to automatically require the installation of twice as many (or more) Class N devices as compared to a design based on Class A, B, or X pathways. The risks inherent to Class N are different from the risks inherent to Class A, B, or X.

Class A and B pathways are permitted to lose devices in a zone *(see Section 23.6)* upon a multiple ground-fault pathway failure. Class A and B pathways require a single ground to be annunciated as a trouble signal. The requirement is to annunciate the first ground fault and alert the user so that the ground fault can be addressed before a possible second ground fault occurs. Note that a second ground fault is also annunciated at the systems operator interface because communication is lost.

Class X pathways are not permitted to lose devices in a zone *(see Section 23.6)* upon a multiple ground-fault pathway failure that results in a short circuit across the pathway. Class X pathways require a single ground to be annunciated as a trouble signal. The requirement is to annunciate the first ground fault and alert the user so that the ground fault can be addressed before a possible second ground fault occurs.

By contrast, Class N is not required to report a trouble condition at the occurrence of the first ground fault because it limits the loss to a single device if another ground occurs. A second ground fault in the Class N pathway, like Class A and B pathways, annunciates a trouble condition at the systems operator interface because communication is lost.

In summary, the potential risk of a loss of fire alarm function in an area must be considered in Class N network design. Multiple ground faults might cause such a loss in an area, especially after no one was alerted of a trouble condition at the first ground fault.

The term “device” in this context should be understood in conjunction with the definition of Device (Class N) 3.3.78 and the associated annex material A.3.3.78. An area is a separated space within a zone where initiating devices or notification appliances are required. Examples include an office, conference rooms, or temporary partitioned banquet rooms where alarm notification is required. Factors to consider when determining the need for multiple Class N devices within an area or zone include the following: whether the space is acoustically and/or visually isolated; specific audible and visual indication of trouble to the occupants in that area for a related ground-fault pathway failure of any device/appliance in that area; the pathways to devices in the area are not susceptible to ground faults such as fiber-optic or wireless pathways.

Also, multiple devices are not required when devices/appliances are connected by redundant pathways. For example, consider the dual port devices deployed as per A.12.3.6(5). For example, the failure of a sole Class N initiating device might delay or prevent the timely initiation of an alarm.

Depending on the facility and the risks for that occupancy, areas serviced by single devices, without redundant pathways, that are susceptible to ground faults should be established by the system designer and approved by the authority having jurisdiction.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 11:34:12 EDT 2020

Committee Statement

Committee Statement: The Technical Committee accepts the text change as it provides consistency in optical fiber terminology.

Response Message: SR-5055-NFPA 72-2020

Public Comment No. 97-NFPA 72-2020 [Section No. A.23.6.2]

Second Revision No. 5057-NFPA 72-2020 [Section No. A.23.6.3.3.3.2]

A.23.6.3.3.3.2

Life safety Class N network cabling, equipment, and infrastructure might include (but is not limited to) Ethernet switches, media converters, uninterruptible power supplies, separate life safety network dedicated branch circuit power, cabling cross connects, and both copper and optical fiber cabling.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Fri Jun 19 11:37:24 EDT 2020

Committee Statement

Committee Statement: The Technical Committee accepts the text change as it provides consistency in optical fiber terminology.

Response Message: SR-5057-NFPA 72-2020

Public Comment No. 98-NFPA 72-2020 [Section No. A.23.6.3.3.3.2]

Second Revision No. 5079-NFPA 72-2020 [Section No. A.23.10.2]

A.23.10.2

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) Installing a fire alarm system in a fully sprinklered building in accordance with NFPA 13

(2) Routing notification appliance circuits separately

(3) Using short-circuit fault-tolerant signaling line circuits for controlling evacuation signals

The requirement for notification appliances to operate in those notification zones that are not attacked by fire will also require that circuits and equipment that are common to more than one ~~signaling~~ notification zone be designed and installed such that the fire will not disable them. For instance, a signaling line circuit used to control notification appliances in multiple notification zones should be properly designed and installed so that one fire would not impair more than one notification zone. Power supply requirements of Chapter 10 apply to these systems. The secondary power supply requirements of that chapter meet the intent of these survivability requirements.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 24 10:17:52 EDT 2020

Committee Statement

Committee Statement: The Technical Committee does not agree with revising the text as proposed by PC-150, and is therefore rejecting this comment. The existing examples in the annex, including sprinkler protection, are reasonable means for ensuring system survivability for the required 5 minutes of alarm, and should not be deleted. Newly proposed text does not enhance existing annex text, and performance based approaches, if used are addressed by paragraph 23.10.3, thus don't belong in this annex.

The Technical Committee revises "signaling" to "notification" in the last paragraph of the annex to correct intended terminology.

Response Message: SR-5079-NFPA 72-2020

Public Comment No. 150-NFPA 72-2020 [Section No. A.23.10.2]

Second Revision No. 5080-NFPA 72-2020 [Section No. A.23.16]

A.23.16

The term *wireless* has been replaced with the term *low-power radio* to eliminate potential confusion with other transmission media such as fiber~~-optic cables~~ optics .

Low-power radio devices are required to comply with the applicable low-power requirements of Title 47, Code of Federal Regulations, Part 15.

Submitter Information Verification

Committee: SIG-PRO

Submittal Date: Wed Jun 24 10:28:58 EDT 2020

Committee Statement

Committee Statement: The Technical Committee revises the text as proposed in PC-99 by replacing the term “fiber cables” with “fiber optics” for consistency.

Response Message: SR-5080-NFPA 72-2020

Public Comment No. 99-NFPA 72-2020 [Section No. A.23.16]

Second Revision No. 5049-NFPA 72-2020 [Section No. C.2.1.3.2]

C.2.1.3.2 Control.

Nonprimary response locations might be intended to provide a partial or complete fire command center or emergency command center to provide control functions for the entire building, or for a portion of the building associated with the response location.

Submitter Information Verification

Committee: SIG-PRO
Submittal Date: Thu Jun 18 16:07:58 EDT 2020

Committee Statement

Committee Statement: The Technical Committee revises the text and adds emergency command center.
Response Message: SR-5049-NFPA 72-2020

Public Comment No. 349-NFPA 72-2020 [Section No. C.2.1.3.2]