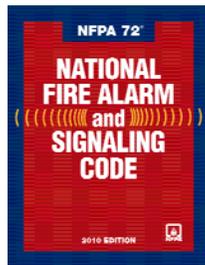
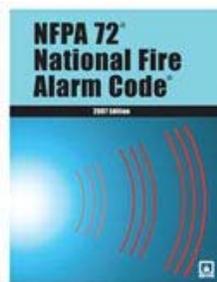


2010 NFPA 72: National Fire Alarm and Signaling Code Overview

*Presented by
Roger Reiswig, Tyco Fire Protection Products
for the*

*Office of Education and Data Management
Fall 2015 Career Development Series*

WHAT'S NEW IN NFPA 72 for 2010 and 2013 EDITIONS?



**Rodger Reiswig, SET
Director, Industry Relations
Tyco Fire Protection Products**

Take Fire out of NFPA 72? Why the change?



NFPA 72 covers many issues in addition to Fire Alarm Systems.

- Combination Systems
- Video Imaging Detection
- Carbon Monoxide Detection
- Supervisory Service of Sprinkler Control Valves
- Water Level Supervisory – 5.15.3
- Water Temperature Supervisory – 5.15.4
- Room Temperature Supervisory – 5.15.5
- Fire Extinguisher Monitoring – 6.8.4.11

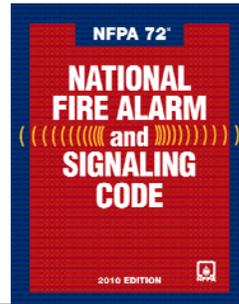
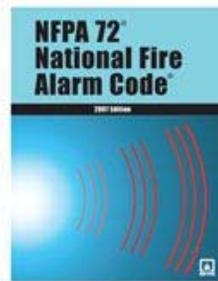
NFPA TCC Directive for 2010

Remove the word fire wherever possible

- Chapter 4 – Fundamentals of Fire Alarm Systems
- Chapter 8 – Supervising Station Fire Alarm Systems
- 8.3.7.1.1 Alarm signals initiated by manual fire alarm boxes, automatic fire detectors, waterflow from the automatic sprinkler system, or actuation of other fire suppression system(s) or equipment shall be treated as fire alarms.

NFPA 72 Name Change?

- Old Name – National Fire Alarm Code
- New Name
 - National Fire Alarm and Signaling Code



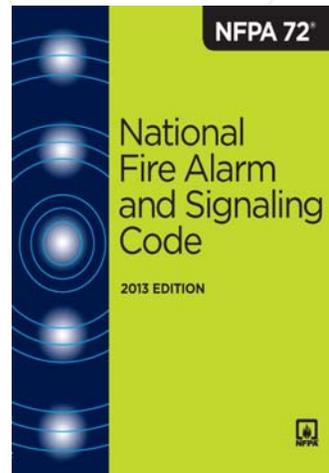
NFPA 72, 2010 Chapter Re-Organization

2007 edition had 11 Chapters

2010 and 2013 editions have 29 Chapters

- Administrative Chapters
- Support Chapters
- System Chapters
- Usability Chapters

NFPA 72



Organization of NFPA 72, 2010 & 2013

- Better organization
- Easier to locate key requirements
- Future growth

Administrative
Chapters
1 - 9

Support
Chapters
10 - 19

System
Chapters
20 - 29

Usability
Annexes
A - I

Administrative Chapters

1. Administration
2. Referenced Publications
3. Definitions
4. Reserved
5. Reserved
6. Reserved
7. **Documentation (New in 2013)**
8. Reserved
9. Reserved



Support Chapters

10. Fundamentals
11. Reserved
12. Circuits and Pathways
13. Reserved
14. Inspection, Testing, and Maintenance
15. Reserved
16. Reserved
17. Initiating Devices
18. Notification Appliances
19. Reserved



SUPPORT

System Chapters

- 20. Reserved
- 21. Emergency Control Functions and Interfaces
- 22. Reserved
- 23. Protected Premises Fire Alarm Systems
- 24. Emergency Communications Systems
- 25. Reserved
- 26. Supervising Station Alarm Systems
- 27. Public Emergency Alarm Reporting
- 28. Reserved
- 29. Single- and Multiple-Station Alarms and Household Fire Alarm Systems

Usability Annexes

- A. Explanatory Material
- B. Engineering Guide for Automatic Fire Detector Spacing
- C. System Performance and Design Guide
- D. Speech Intelligibility
- E. NEMA SB 30, Fire Service Annunciator and Interface
- F. Sample Ordinance Adopting NFPA 72
- G. Informational References
- H. Cross-Reference Table
- I. Index

Functional Layout

Administrative Chapters 1 - 9

1. Administration
2. Referenced Publications
3. Definitions
4. Reserved
5. Reserved
6. Reserved
7. Documentation (2013)
8. Reserved
9. Reserved

Support Chapters 10 - 19

10. Fundamentals
11. Reserved
12. Circuits and Pathways
13. Reserved
14. Inspection, Testing, and Maintenance
15. Reserved
16. Reserved
17. Initiating Devices
18. Notification Appliances
19. Reserved

System Chapters 20 - 29

20. Reserved
21. Emergency Control Functions and Interfaces
22. Reserved
23. Protected Premises Fire Alarm Systems
24. Emergency Communications Systems
25. Reserved
26. Supervising Station Alarm Systems
27. Public Emergency Alarm Reporting
28. Reserved
29. Single- and Multiple-Station Alarms and Household Fire Alarm Systems

Usability Annexes A - I

- A. Explanatory Material
- B. Engineering Guide for Automatic Fire Detector Spacing
- C. System Performance and Design Guide
- D. Speech Intelligibility
- E. NEMA SB 30, Fire Service Annunciator and Interface
- F. Sample Ordinance Adopting NFPA 72
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- I. Index

Chapter 3 New Definitions

- Accessible – four versions
- Communications Cloud
- Deficiency
- ECS Emergency Command Center
- Fire Command Center
- Emergency Control Function Interface
- Impairment
- Manufacturer's Published Instructions
- Occupiable
- Occupiable Area
- System Designer
- System Installer



Chapter 3 - Definitions

- 3.3.1 Accessible
- 3.3.4 Accessible Spaces

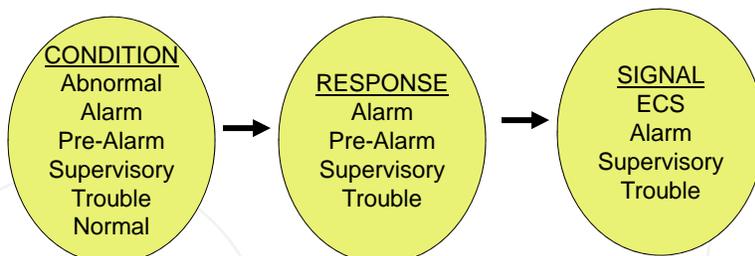


- There are several new definitions relating to accessibility including
 - Accessible as applied to equipment
 - Accessible as applied to wiring methods
 - Readily accessible as applied to installation
 - Accessible spaces as applied to detection coverage

Chapter 3 - Definitions

- 3.3.57 Condition
- 3.3.244 Response

- New concept for process of signals.



Chapter 3 - Definitions

- 3.3.91 Emergency Control Functions
- 3.3.137.1.2 Emergency Control Function Interface
- Change in terminology – this definition use to be known as “FIRE CONTROL FUNCTIONS”

Chapter 3 - Definitions

- 3.3.102.2.1 Dedicated Function FACU (component)
- 3.3.105.4.2 Dedicated function FAS
- Dedicated function fire alarm systems and dedicated fire alarm control units are used when fire alarm systems are not required but there is a need for a fire alarm control panel for other code-required functions.

Chapter 3 - Definitions

- 3.3.257 Signal



- This definition was expanded to include a number of different kinds of signals:
 - Alarm
 - Carbon Monoxide Alarm
 - Delinquency
 - Evacuation
 - Fire Alarm
 - Guard's Tour Supervisory
 - Pre-Alarm
 - Restoration
 - Supervisory
 - Trouble

Chapter 3 - Definitions

- 3.3.307 Unwanted Alarm



- New definition with several types of "unwanted alarms"
 - Malicious
 - Nuisance
 - Unintentional
 - Unknown

Chapter 7 Documentation

- 7.1 Application
- 7.2 Minimum Required Documentation
- 7.3 Design (Layout) Documentation
- 7.4 Shop Drawings (Installation Documentation)
- 7.5 Completion Documentation
- 7.6 ITM Documentation
- 7.7 Record Retention & Management
- 7.8 Forms



Chapter 7 - Documentation

- Applies to new systems
 - Design
 - Acceptance
 - Completion
- Applies to existing systems
 - Alterations
 - Maintenance
 - Testing
- Does NOT apply to Single Station, Multiple Station and Household Systems



Chapter 7 – Documentation Minimum Requirements

- Written Narrative
- Riser Diagram
- Floor Plan
- Sequence of operation (matrix or narrative)
- Equipment technical data sheets
- Manufacturers published instructions



Chapter 7 – Documentation Minimum Requirements

- Battery calculations
- Voltage drop calculations for NACs
- Completed record of inspection and testing
- Completed record of completion
- A copy of site specific software
- Record (as-built) drawings



7.7.2 Document Accessibility

- With every new system, a documentation cabinet shall be installed at the system control unit or at another approved location at the protected premises
- All record documentation shall be stored in the documentation cabinet
- Where this documentation cabinet is not in the same location as the system control unit, its location shall be identified at the system control unit

7.7.2 Document Accessibility

- The documentation cabinet shall be prominently labeled SYSTEM RECORD DOCUMENTS
- The contents of the cabinet shall be accessible by authorized personnel only.

Documentation Cabinet



Fundamentals Chapter 10 2010 Edition

- The Chapter has been renamed "Fundamentals." "Fire Alarm" deleted.
- The Chapter includes requirements for Emergency Communications Systems.
- The word "fire" has been removed throughout in relation to fire alarm systems, as the Code also covers Emergency Communications Systems.

Fundamentals Chapter 10

2010 Edition

10.4 Personnel Qualifications.

10.4.1 System Designer.

10.4.2 System Installer.

10.4.3 Inspection, Testing, and Maintenance Personnel. (SIG-TMS)

10.4.4 Supervising Station Operators. (SIG-SSS)

Fundamentals Chapter 10

2010 Edition

10.5.6.1.2 Secondary circuits that provide power to the control unit and are not integral to the unit shall be protected against physical damage.

- *Added the protection of secondary power circuits.*

Fundamentals Chapter 10

2010 Edition

10.5.6.3 Capacity

10.5.6.3.1.(A) Battery calculations shall include a 20 percent safety margin to the calculated amp-hour rating

- *This provides alignment with UL 864 9th edition and the realization that over the life of a battery, it will decay.*

Fundamentals Chapter 10

2010 Edition

10.6 Signal Priority. The priority of signals shall be in accordance with 10.6

10.6.1 ECS priority signals when evaluated by stakeholders through a risk analysis in accordance with 12.2.2.12 shall be permitted to take precedence over all other signals.

- *This includes fire alarm signals.*

Fundamentals Chapter 10

2010 Edition

10.15 Protection of Fire Alarm Systems.

- *Exception (2) has been removed. This exempted the requirement for smoke or heat detector protecting the FACU, NAC's or DACT's if the building is fully sprinklered per NFPA 13.*

Fundamentals Chapter 10

2010 Edition

10.18.2.1.2.7 Where not stored at the main fire alarm control unit, the location of these documents shall be identified at the main fire alarm control unit.

- *Requires the location of the Record of Completion to be identified at the FACU.*

Fundamentals Chapter 10 2010 Edition

10.18.2.1.2.8 If the documents are located in a separate enclosure or cabinet, the separate enclosure or cabinet shall be prominently labeled FIRE ALARM DOCUMENTS.

- *Documents related to the fire alarm system can no longer be hidden*



Fundamentals Chapter 10 2010 Edition

Record of Completion.

- *Has been expanded to 12 pages to enhance its usability.*
- *Note – All record of completion and testing documents are available from NFPA for **free** at www.NFPA.org*

Fundamentals Chapter 10 2013 Edition

- 10.6.5.2.2 Circuit Identification
- 10.6.5.4 Circuit Breaker Lock
- 10.8 Condition Detection Signaling
- 10.9 Responses
- 10.18.3.2 Annunciator Location
- 10.22 Unwanted Alarm Reporting



Fundamentals Chapter 10 2013 Edition

- Changes to circuit breaker identification
 - FIRE ALARM
 - EMERGENCY COMMUNICATIONS
 - FIRE ALARM/ECS
- 10.6.5.2.2 Circuit Identification



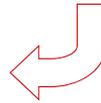
Fundamentals Chapter 10 2013 Edition



- Requires circuit breaker lock under all circumstances
- 10.6.5.4 Circuit Breaker Lock



NO, THE LOCK
IS NOT
REQUIRED!



Fundamentals Chapter 10 2013 Edition

- 10.8 and 10.9 refer back to the “Condition-Response-Alarm” concept
- 10.8 Condition Detection Signaling
 - 10.8.1 Abnormal Condition Detection
 - 10.8.2 Alarm Condition Detection
 - 10.8.2.1 Pre-Alarm Condition Detection
 - 10.8.2.2 Supervisory Condition Detection
 - 10.8.2.3 Trouble Condition Detection
 - 10.8.2.4 Normal Condition Detection
- 10.9 Responses

Fundamentals Chapter 10

2013 Edition

- All required annunciation means shall be located as required by the AHJ to facilitate an efficient response to the situation.
- 10.18.3.2 Annunciator Location



Fundamentals Chapter 10

2013 Edition

- For the purpose of reporting, alarm signals that are not the result of hazardous conditions shall be classified as Unwanted and sub classified as one of the following:
 - Malicious
 - Nuisance
 - Unintentional
 - Unknown
- 10.22 Unwanted Alarm Reporting

Circuits and Pathways - Chapter 12 2010 Edition

- Wiring tables being replaced with a new system for specifying wiring redundancy and survivability
- Includes removal of all of the old class and style tables and designations and the implementation of new Classes that will be applicable to any type of fire alarm circuit, not just SLCs, IDCs, and NACs as in the past.
- The term "pathway" is used instead of circuit to account for the use of optical fibers, radio, hardwires, and anything else that may appear in the marketplace.

Circuits and Pathways - Chapter 12 2010 Edition

12.1 Application.

12.1.1 Paths (interconnections) shall be designated based upon the performance characteristics defined in this chapter.

12.2 Purpose.

12.2.1 This chapter describes the performance and survivability characteristics for defined class designations of signaling paths (interconnections).

Circuits and Pathways - Chapter 12 2010 Edition

12.2.2 A path's (interconnection's) class designation is dependant on the path's (interconnection's) capability to continue to operate during specified fault conditions.

12.2.3 The designation of the paths can also include the performance of the path (interconnection) to survivability from attack by fire.

Circuits and Pathways - Chapter 12 2010 Edition

12.4.2.1 Pathway Class Designations

Pathways shall be designated as Class A, B, C, D, E, or X, depending on their performance as follows:

Class A*. A pathway with a redundant path. Operational capability continues past a single break. Conditions that affect the intended operation of the path are annunciated.

Class B. A pathway without a redundant path. Operational capability stops at a break. Conditions that affect the intended operation of the path are annunciated.

Circuits and Pathways - Chapter 12 2010 Edition

Class C. One or more pathways where operational capability is verified via end-to-end communication, but the integrity of individual paths is not monitored. A loss of end-to-end communication is annunciated.

Class D. A pathway that has fail-safe operation, where no fault is annunciated, but the intended operation is performed instead.

Circuits and Pathways - Chapter 12 2010 Edition

Class E. A pathway which is not monitored for integrity.

Class X. A pathway with a redundant path. Operational capability continues past a single break or short-circuit. Conditions that affect the intended operation of the path are annunciated.

Circuits and Pathways - Chapter 12 2010 Edition

Survivability has also been assigned "levels" in recognition that one size does not fit all. For example:

12.1.2.5 Pathway Survivability Level 0

12.1.2.5.1 Pathway survivability Level 0 shall consist of the following:

- a. Pathways shall comply with the requirements of NFPA 70 Articles 760, 770 or 800

Circuits and Pathways - Chapter 12 2010 Edition

12.1.2.7 Pathway Survivability Level 1

12.1.2.7.1 Pathway survivability Level 1 shall consist of the following:

- a. Pathways in buildings fully protected by an automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems and with the interconnecting wiring or cables installed in metal raceways

Circuits and Pathways - Chapter 12 2010 Edition

12.1.2.8 Pathway Survivability Level 2

12.1.2.8.1 Pathway survivability Level 2 shall consist of the following:

- a. 2-hour fire rated circuit integrity (CI) cable or,
- b. 2 hour fire rated cable system (electrical circuit protective system (s) or,
- c. 2-hour fire rated enclosure or protected area or,
- d. 2-hour performance alternatives approved by the authority having jurisdiction

Circuits and Pathways - Chapter 12 2010 Edition

12.1.2.9 Pathway Survivability Level 3

12.1.2.9.1 Pathway survivability Level 3 shall consist of the following:

- a. Pathways in buildings fully protected an automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems and 2-hour fire rated circuit integrity (CI) cable or,
- b. Pathways in buildings fully protected an automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems and 2 hour fire rated cable system (electrical circuit protective system(s)) or,

Circuits and Pathways - Chapter 12 2010 Edition

- c. Pathways in buildings fully protected an automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems and 2-hour fire rated enclosure or protected area or,
- d. Pathways in buildings fully protected an automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems and 2-hour performance alternatives approved by the authority having jurisdiction

Circuits and Pathways - Chapter 12 2010 Edition

Pathway Class Designations

– A, B, C, D, E, X

Survivability Levels

– 0, 1, 2, 3

Circuits and Pathways - Chapter 12 2013 Edition

- 12.3 Pathway Class Designation
- 12.5 Shared Pathway Designations



Circuits and Pathways - Chapter 12 2013 Edition

- 12.3 Pathway Class Designation
- In 2013 there is more clarification for performance of Class A, Class B, and Class X Circuits



Circuits and Pathways - Chapter 12 2013 Edition

- 12.5 Shared Pathway Designations
- Shared Pathways:
 - Level 0
 - Level 1
 - Level 2
 - Level 3

Circuits and Pathways - Chapter 12 2013 Edition

- Pathway designations for signaling line circuits when they are being considered for both life safety and non-life safety applications. Establishes designations for shared pathways in terms of how life safety data and non-life safety data are prioritized or segregated
- **Level 0** – Level 0 pathways shall not be required to segregate or prioritize life safety data from non life safety data.
- **Level 1** – Level 1 pathways shall not be required to segregate life safety data from non life safety data but shall prioritize life safety data from non life safety data
- **Level 2** – Level 2 pathways shall segregate all life safety data from non life safety data
- **Level 3** – Level 3 pathways shall use equipment that is dedicated to the life safety system.

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

- Includes Emergency Communications Systems.
- Revised requirements for the testing of intelligible voice communications.
- New allowance for automated testing.
- New requirements for the testing of gas detectors.



Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

- New requirement for the replacement of combination smoke/carbon monoxide alarms after ten years.
- New requirements for the commissioning and testing of in-building emergency radio communication systems.

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

14.2.4 System Documentation.

14.2.4.1 The provided documentation shall include the current revisions of all fire alarm software and the revisions of software of any systems with which the fire alarm software interfaces.

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

14.2.4.2 The revisions of the fire alarm software, and the revisions of the software in the systems with which the fire alarm software interfaces, shall be verified for compatibility in accordance with the requirements of 23.2.2.1.1.

23.2.2.1.1* Software and firmware within the fire alarm control system that interfaces to other required software or firmware shall be functionally compatible.

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

14.2.7 Automated Testing.

14.2.7.1 Automated testing arrangements that provide equivalent means of testing devices to those specified in Table 14.4.2.2 at a frequency at least equivalent to those specified in Table 14.4.5 shall be permitted to be used to comply with the requirements of this chapter.

14.2.7.2 Failure of a device on an automated test shall result in an audible and visual trouble signal.

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

14.4.4 Gas detectors shall be inspected, tested, and maintained in accordance with the manufacturers' published instructions.

- *Correlates with the addition of gas detection in Chapter 17.*

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

14.4.7 Household Fire Alarm Systems.

14.4.8 Replacement of Smoke Alarms in One- and Two-Family Dwellings.

14.4.8.2 Combination smoke/carbon monoxide alarms shall be replaced when the end-of-life signal activates or 10 years from the date of manufacture, whichever comes first.

- *The Code now recognizes that these type of alarms are being used.*

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

14.4.12 In-Building Emergency Radio Communication Systems.

This section was expanded from 2007 to cover:

- *Signal level testing.*
- *System commissioning testing.*
- *Test procedures*
- *Measurement parameters*
- *Acceptance Test*
- *Annual Tests*

Chapter 14 – Inspection, Testing, and Maintenance, 2010 Edition

Record of Inspection and Testing

- *Has been expended to 12 pages*
- *Includes mass notification system interface*

Chapter 14 – Inspection, Testing, and Maintenance, 2013 Edition

- 14.2.2.2 Impairments/Deficiencies
- 14.2.3.2 Delegation of Responsibility
- 14.2.10 Test Plan
- Table 14.4.3.2 Format
- 14.4.11 Voice Intelligibility



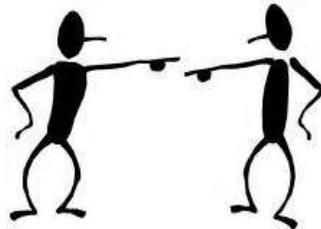
Chapter 14 – Inspection, Testing, and Maintenance, 2013 Edition

- 14.2.2.2 Impairments/Deficiencies
 - System deficiencies shall be corrected
 - If not corrected at the time of the conclusion of ITM, owner shall be notified within 24 hours in writing.



Chapter 14 – Inspection, Testing, and Maintenance, 2013 Edition

- 14.2.3.2 Delegation of Responsibility
 - Property owner shall be able to delegate authority and responsibility to the occupant



Chapter 14 – Inspection, Testing, and Maintenance, 2013 Edition

- 14.2.10 Test Plan
 - A test plan shall be written to clearly establish the scope of the testing for the system.
 - The test plan and results shall be documented in the testing records.



Chapter 14 – Inspection, Testing, and Maintenance, 2013 Edition

- Table 14.4.3.2 Format
 - The two tables for testing (testing methodology and testing frequencies) were combined into one table
 - Component
 - Periodic Frequency
 - Method

Chapter 14 – Inspection, Testing, and Maintenance, 2013 Edition

- 14.4.11 Voice Intelligibility
 - Follow requirements of Chapter 18
 - Intelligibility shall not be required to be determined through quantitative measurements
 - Quantitative measurements (Annex D) shall be permitted but not required



Chapter 17 – Initiating Devices 2010 Edition

17.4.6 Initiating devices shall be installed in all areas, compartments, or locations where required by other NFPA codes and standards or as required by other governing laws, codes, or standards.

- *This replaces AHJ, and has been added through the body of NFPA 72®.*

Chapter 17 – Initiating Devices 2010 Edition

17.7.1.11 Protection During Construction.

17.7.1.11.1 Where detectors are installed for signal initiation during construction, they shall be cleaned and verified to be operating in accordance with the listed sensitivity, or they shall be replaced prior to the final commissioning of the system.

Chapter 17 – Initiating Devices 2010 Edition

17.7.1.11.2 Where detectors are installed but not operational during construction, they shall be protected from construction debris, dust, dirt and damage in accordance with the manufacturer's recommendations and verified to be operating in accordance with the listed sensitivity, or they shall be replaced prior to the final commissioning of the system.

Chapter 17 – Initiating Devices 2010 Edition

17.7.1.11.3 Where detection is not required during construction they shall not be installed until after all other construction trades have completed cleanup.

- *This is an expansion over previous text.*

Chapter 17 – Initiating Devices 2010 Edition

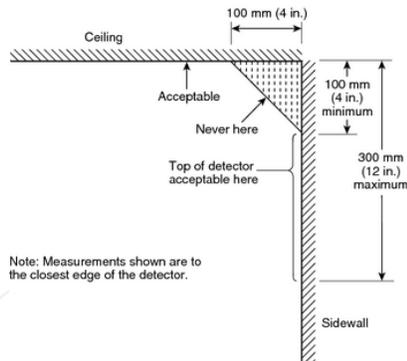
17.7.3.2 Spot-Type Smoke Detectors

17.7.3.2.1 Spot-type smoke detectors shall be located on the ceiling or, if on a sidewall, between the ceiling and 12 in. (300 mm) down from the ceiling to the top of the detector.

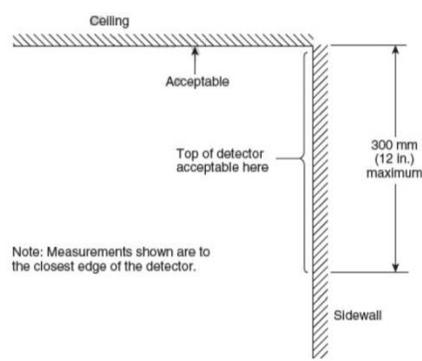
- *The 4 inch restriction has been removed.*

Spacing of Smoke Sensors

72, 2007



72, 2010 & 2013



Chapter 17 – Initiating Devices 2010 Edition

17.7.3.2.4.2 For level ceilings with beam depths of less than 10 percent of the ceiling height ($0.1 H$), smooth ceiling spacing shall be permitted. Spot-type smoke detectors shall be permitted to be located on ceilings or on the bottom of the beams.

Chapter 17 – Initiating Devices 2010 Edition

17.10 Gas Detection.

17.10.1 General. The purpose and scope of Section 17.10 shall be to provide requirements for the selection, installation, and operation of gas detectors.

Chapter 17 – Initiating Devices 2010 Edition

17.10.2 Gas Characteristics and Detector Selection.

17.10.2.1 Gas detection equipment shall be listed for detection of the specific gas or vapor to be encountered.

17.10.2.2 Any gas detection system installed on a fire alarm system shall comply with all the applicable requirements of Chapters 1,10,14,17 and 23 of this Code.

Chapter 17 – Initiating Devices 2013 Edition

- 17.4.4 Accessible installation required
- 17.4.8 Remote indicators
- 17.14. Manual Alarm Boxes



Chapter 17 – Initiating Devices 2013 Edition

- Initiating devices shall be installed in a manner that provides accessibility for periodic inspection, testing and maintenance.
- 17.4.4 Accessible installation required



Chapter 17 – Initiating Devices 2013 Edition

- Modified requirements for labeling of remote indicators
- 17.4.8 Remote indicators



Chapter 17 – Initiating Devices 2013 Edition

- Updated requirements for manual boxes for fire and non-fire purposes
- 17.14. Manual Alarm Boxes



Chapter 18 – Notification Appliances 2010 Edition

18.4.2 Distinctive Evacuation Signal

- *Moved from Protected Premises to Notification Appliances.*

Chapter 18 – Notification Appliances 2010 Edition

18.4.5 Sleeping Area Requirements.

18.4.5.3 Effective January 1, 2014, where audible appliances are provided to produce signals for sleeping areas, they 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 shall have a fundamental frequency of 520 Hz \pm 10 percent.

Chapter 18 – Notification Appliances 2010 Edition

18.4.10 Voice Intelligibility. Within the acoustically distinguishable spaces (ADS) where voice intelligibility is required, voice communications systems shall reproduce prerecorded, synthesized, or live (e.g., microphone, telephone handset, and radio) messages with voice intelligibility.

Chapter 18 – Notification Appliances 2010 Edition

18.4.10.1 Acoustically distinguishable spaces (ADS) shall be determined by the system designer during the planning and design of all emergency communications systems.

18.4.10.2 Each ADS shall be identified as requiring or not requiring voice intelligibility.

18.4.10.3 Where required by the authority having jurisdiction, ADS assignments shall be submitted for review and approval.

Chapter 18 – Notification Appliances 2010 Edition

3.3.2* Acoustically Distinguishable Space (ADS).

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

Chapter 18 – Notification Appliances 2013 Edition

- 18.4.1.4.1 Designated audible areas
- 18.4.2.1 Temporal III used for more than evacuation
- 18.5.5.2 Strobe mounting alternatives
- 18.9 Textual and Graphical Visible Appliances



Chapter 18 – Notification Appliances 2013 Edition

- 18.4.1.4.1 Designated audible areas
 - Designer to designate where audible notification will be installed and those areas where audible notification is not required.



Chapter 18 – Notification Appliances 2013 Edition

- 18.4.2.1 Temporal III used for more than evacuation
 - Evacuate
 - Relocate



Chapter 18 – Notification Appliances 2013 Edition

- 18.5.5.2 Strobe mounting alternatives
 - Low ceilings where 80-96” is not achievable
 - Formula to determine rating of strobes when mounted in accordance with this section



Chapter 18 – Notification Appliances 2013 Edition

- 18.9 Textual and Graphical Visible Appliances
 - Section revised to include location (private and public modes), performance, character and symbol requirements and viewing distances



Chapter 21 – Emergency Control Functions and Interfaces, 2010 Edition

- Used to be Fire Safety Functions in Chapter 6
- Name changed to include non-fire alarm emergency functions
- Includes requirements for elevator recall

Chapter 21 – Emergency Control Functions and Interfaces, 2013 Edition

- Title Changed to “Emergency Control Function Interfaces”
- 21.3.7 Elevator pit sprinklers trigger detection
- 21.5 Fire Service Access Elevators
- 21.6 Occupant Evacuation Elevators

Chapter 21 – Emergency Control Functions and Interfaces, 2013 Edition

- 21.3.7 Elevator pit sprinklers trigger detection
 - When sprinklers are installed in elevator pits, automatic fire detection shall be installed to initiate elevator recall.



Chapter 21 – Emergency Control Functions and Interfaces, 2013 Edition

- 21.5 Fire Service Access Elevators
 - Conditions for fire service access elevators where provided



Chapter 21 – Emergency Control Functions and Interfaces, 2013 Edition

- 21.6 Occupant Evacuation Elevators
 - Conditions for occupant evacuation elevators where installed



Chapter 23 – Protected Premises 2010 Edition

- All voice communications material is moving out of chapter 6 and into chapter 24
- Fire Safety Functions are also moving to chapter 21
 - Generalizes material in chapter 21 and allows for both fire alarm and mass notification correlation

Chapter 23 – Protected Premises 2010 Edition

- Requirements for combination systems revised
 - Sharing wiring for robust systems will be easier
- Language added to Annex confirming that the Chapter is applicable to fire alarm systems used for mass notification.
- Language revised to not limit application to fire emergencies only.

Chapter 23 – Protected Premises 2010 Edition

23.8.5.1.2* Where connected to a supervising station, fire alarm systems employing automatic fire detectors or waterflow detection devices shall include a manual fire alarm box to initiate a signal to the supervising station.

Exception: Fire alarm systems dedicated to elevator recall control and supervisory service as permitted in Section 21.3.

Chapter 23 – Protected Premises 2013 Edition

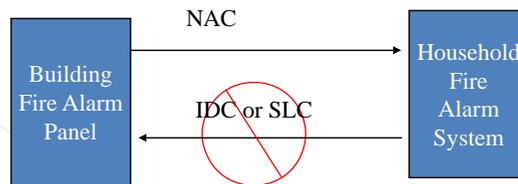
- 23.3.3.2 Dedicated Function Fire Alarm Systems
- 23.8.3.2 Interconnection of Bldg FAS to Household Panel
- 23.8.4.8 CO Signals
- 23.8.5.6.3 Monitoring of Sprinkler System valves
- 23.10 FAS using Tones

Chapter 23 – Protected Premises 2013 Edition

- 23.3.3.2 Dedicated Function Fire Alarm Systems
- Dedicated function fire alarm systems are used when a building fire alarm system is not required but a fire alarm control panel is needed for waterflow monitoring or other dedicated use.

Chapter 23 – Protected Premises 2013 Edition

- 23.8.3.2 Interconnection of Bldg Fire Alarm System to a Household Panel



Chapter 23 – Protected Premises 2013 Edition

- 23.8.4.8 Carbon Monoxide Signals
 - CO signals shall be indicated as carbon monoxide alarm signals



Chapter 23 – Protected Premises 2013 Edition

- 23.8.5.6.3 Monitoring of Sprinkler System valves
 - Permits monitoring of sprinkler system valves (waterflow and valve supervisory) with
 - Building Fire Alarm System
 - Dedicated Function Fire Alarm System

Chapter 23 – Protected Premises 2013 Edition

- 23.10 Fire Alarm Systems Using Tones
 - Requires survivability for fire alarm systems using tones for partial evacuation and relocation

Mass Notification and NFPA

NFPA and Mass Notification

- Air Force Civil Engineering petitioned NFPA in June 2003
 - Added Mass Notification to Annex of 72-2007
- NFPA Standards Council approved new Chapter in 72-2010
- Technical Committee formed
- Several meetings took place
 - Draft document created
 - ROP, Report on Proposals
 - ROC, Report on Comments

NFPA and Mass Notification

New Technical Committee

Technical Committee Scope:

This Committee shall have primary responsibility for documents on the installation and performance of emergency communications systems (including mass notification systems), and their components.

Chapter reference for MNS currently in NFPA 72, 2007

Chapters 4 thru 11 currently ends with:

Mass Notification Systems. See Annex E.

NFPA and Mass Notification

Current NFPA 72 Annex E, Mass Notification Systems replaced by Chapter 24 **Emergency**

Communications Systems

- Content from Chapter 6, Protected Premises Fire Alarm Systems
 - Emergency Voice Alarm Communications
 - Two-Way Communication Service

NFPA and Mass Notification

Chapter 24 Emergency Communications Systems

24.1 Introduction

Emergency Communications Systems (ECS) shall consist of two classifications of systems, one-way and two-way.

NFPA and Mass Notification

Chapter 24 Emergency Communications Systems

24.2 One-Way Emergency Communications Systems

24.2.1 In-Building Emergency Voice/Alarm Communications Systems

24.2.1.1* Section 24.2.1 shall be used in the design and application of emergency voice/alarm communications for fire alarm systems.

NFPA and Mass Notification

Chapter 24 Emergency Communications Systems

24.2.1.8 Priority.

24.2.1.8.1 When the fire alarm system has been activated, and mass notification has been given priority, an audible and visible indication shall be provided at the building fire alarm control unit.

24.2.1.8.2 The fire alarm system shall not automatically override emergency mass notification messages.

NFPA and Mass Notification

Chapter 24 Emergency Communications Systems

24.2.1.11* Relocation and Partial Evacuation.

The requirements of 24.2.1.11 shall apply only to systems used for relocation or partial evacuation.

NFPA and Mass Notification

- Chapter 24 is a complete set of requirements for emergency communications systems – including requirements from other chapters by reference.
- Includes EVAC and Two-way communications relocated from Chapter 6.
 - Fire Fighter phones
 - Fire Alarm Voice Evacuation

One-Way ECS In-Building EVACs

- Relocation of section 6.9 and other requirements
- Survivability requirements to reference new chapter
- Permits a mass notification control unit to take control of fire alarm notification appliances including amplifiers, speakers, and strobes
- Requires a tone or voice message any time the priority is granted to the mass notification control unit
- Strobes used for dual purposes shall not be marked 'FIRE', strobes to be blank or 'ALERT'

Strobes, NFPA and UL

- UL Standards for Strobes
- UL 1971 – Signaling Devices for the Hearing Impaired
- UL 1638 – Visual Signaling Appliances – Private Mode Emergency and General Utility Signaling



Strobes and NFPA



One-Way ECS In-Building MNS

- Operation of MNS system is based on the emergency response plan
- Intelligibility of voice messages are required to meet the requirements of chapter 18 (notification)
- Visual notification to be completed through strobes, textual, graphic or video displays
- Re-labeling of existing strobes labeled fire is required to be completed in a manufacturers approved method

One-Way ECS Wide Area MNS

- High powered speaker arrays (HPSA) for large outdoor areas
- Mounted at heights to prevent hearing damage to nearby persons
- Are not permitted to provide mass notification to occupants inside structures or buildings

One-Way ECS Distributed Recipient MNS

- Communication to a wide range of targeted individuals or groups
- Systems include mass dialing systems, reverse 911, email, SMS (mobile phone text messages), and other directed communication methods

Two-Way ECS Wired Emergency Services

- Firefighter and warden telephones
- Elimination of common talk recommended

Two-Way ECS Radio Emergency Services

- In Building amplifiers
 - Bidirectional amplifiers



Chapter 24 – Emergency Communications Systems, 2013 Edition

- 24.3.8 Mass Notification Layers
- 24.3.11 Risk Analysis for MNS



Chapter 24 – Emergency Communications Systems, 2013 Edition

- 24.3.8 Mass Notification Layers
 - Layer 1 – means of notification of occupants by systems installed inside a building
 - Layer 2 – means of notification of occupants on the exterior of a building
 - Layer 3 – means of notification of personnel through distributed recipient MNS
 - Layer 4 – means of notification of personnel by public measures (public broadcast radio, TV, etc)



Chapter 24 – Emergency Communications Systems, 2013 Edition

- 24.3.11 Risk Analysis for MNS
 - Specifies risk analysis design requirements for mass notification systems.

Chapter 26 – Supervising Station Fire Alarm Systems, 2010 Edition

- **26.6.3.2 Digital Alarm Communicator Systems.**
- **26.6.3.2.1 Digital Alarm Communicator Transmitter (DACT).**
- **26.6.3.2.1.1* Public Switched Network.** A DACT shall be connected to the public switched telephone network upstream of any private telephone system at the protected premises.
 - (A) The connections to the public switched telephone network shall be under the control of the subscriber for whom service is being provided by the supervising station alarm system.

Chapter 26 – Supervising Station Fire Alarm Systems, 2010 Edition

- **26.6.3.2.1.4 Transmission Channels.**
- (A)* A system employing a DACT shall employ one telephone line (number). In addition, one of the following transmission means shall be employed:
 - (1) A second telephone line (number)
 - (2) A cellular telephone connection
 - (3) A one-way radio system
 - (4) A one-way private radio alarm system
 - (5) A private microwave radio system
 - (6) A two-way RF multiplex system
 - (7) A transmission means complying with 26.6.3.1

Chapter 26 – Supervising Station Fire Alarm Systems, 2010 Edition

- **26.6.3.1.4.1 Single Communications Technology.**
- Where only one communications technology is used, any failure of the communications path shall be annunciated at the supervising station within 5 minutes of the failure.
- **26.6.3.1.4.2 Multiple Communications Technologies.**
- Where two or more different technologies are used, the following requirements shall be met:
 - (1) Provision shall be made to monitor the integrity of each communications path.
 - (2) Failure of any communications path shall be annunciated at the supervising station and at the protected premises within not more than 24 hours of the failure.

Chapter 26 – Supervising Station Fire Alarm Systems, 2010 Edition

- Certain legacy technologies (active multiplex, McCulloh, directly connected non-coded and private microwave) have been removed from the text of the document.
- Existing systems utilizing these technologies are acceptable, because all these technologies also comply with the general provisions of 26.6.3.1.

Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.2.1 Alarm Signal Verification
- 26.2.7 Change of Service
- 26.5.2 Indication of Remote Station Service
- 26.6.3.1.5 Single Path Supervision Interval
- 26.6.3.1.6 Multiple Path Supervision Intervals
- 26.6.3.1.15 Secondary Power Requirements
- 26.6.3.2.1.4 DACT Transmission Channels
- 26.6.3.2.1.5 DACT Transmission Means

Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.2.1 Alarm Signal Verification
 - Permitted where specifically required only
 - Requires “pre-verification”
- Steps:
 - Monitoring company receives alarm
 - Monitoring company dispatches “pre-alarm”
 - Monitoring company has 90 seconds to verify alarm
 - Monitoring company will either dispatch or not depending on results of verification



Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.2.7 Change of Service
 - Requires subscribers and AHJs to be notified within 30 days of change of monitoring service where supervising station changes.



Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.5.2 Indication of Remote Station Service
 - Requires affidavit to be submitted annually by owners of remote station fire alarm systems.
 - Owner has to declare who does the required ITM on the system.



Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.6.3.1.5 Single Path Supervision Interval
- 26.6.3.1.6 Multiple Path Supervision Intervals
 - Single transmission path shall be permitted, and path shall be supervised at an interval of not more than 60 minutes
 - If multiple transmission paths are used, each path shall be supervised within not more than 6 hours

Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.6.3.1.15 Secondary Power Requirements
 - Secondary power capacity for all equipment necessary for the transmission of ... signals located at the protected premises shall have a secondary power capacity of 24 hours.

Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.6.3.2.1.4 DACT Transmission Channels
 - The first transmission means shall be a telephone line (number).
 - The second transmission means shall be a one way private radio, two way RF multiplex radio system, or a performance based transmission method as specified in 26.6.3.1.
 - **This means that only one telephone line may be used!**

Chapter 26 – Supervising Station Fire Alarm Systems, 2013 Edition

- 26.6.3.2.1.5 DACT Transmission Means
 - Each transmission means shall automatically initiate and complete a test signal transmission sequence to its associated receiver at least once every 6 hours.

Chapter 27 – Public Emergency Alarm Reporting Systems, 2010 Edition

- 2007 Edition
 - Public Fire Reporting
- 2010 Edition
 - Public Emergency Alarm Reporting Systems
 - Changes in scope to clearly identify requirements already covered by the chapter and now include “emergency alarms” in addition to fire.

Chapter 27 – Public Emergency Alarm Reporting Systems, 2010 Edition

- Clarification of the way users should apply Chapter
- Declaring in 27.1.7 that when a protected premises transmits signals to a communications center via a public emergency alarm reporting system, the entire alarm system becomes classified as an auxiliary alarm system.
- Section 27.4.1.1 describes the types of communications pathways that a public emergency alarm reporting system may use.
- Section 27.4.1.2 grants permission to use a public emergency alarm reporting system with emergency communications systems covered by Chapter 24

Chapter 29 – Single- and Multiple-Station Alarms and Household Fire Alarm Systems, 2010 Edition

- **29.3.8.1 Mild to Severe Hearing Loss.** Notification appliances provided for those with mild to severe hearing loss shall comply with the following:
 - (1) An audible notification appliance producing a low frequency alarm signal shall be installed in the following situations:
 - (a)*Where required by governing laws, codes or standards for people with hearing loss
 - (b) Where provided voluntarily for those with hearing loss
 - (2)*The low frequency alarm signal output shall comply with the following:
 - (a) The alarm signal shall be a square wave or provide equivalent awakening ability.
 - (b)The wave shall have a fundamental frequency of 520 Hz +/- 10%

Chapter 29 – Single- and Multiple-Station Alarms and Household Fire Alarm Systems, 2010 Edition

29.8.2.2 (5) In multiple station configurations that are comprised with multiple purpose alarms, smoke only, and CO only alarms, if the multiple purpose alarm detects an abnormal amount of CO the product will need to sound the CO alarm signal on the remaining interconnected alarms. The smoke only alarm will have an option of remaining silent or to sound the CO alarm signal.

Chapter 29 – Single- and Multiple-Station Alarms and Household Fire Alarm Systems, 2013 Edition

- 29.7.3 Resistance to Nuisance Alarms
 - Effective 1/1/19, smoke alarms and smoke detection used in household fire alarm systems shall be listed for resistance to common nuisance sources.



Chapter 29 – Single- and Multiple-Station Alarms and Household Fire Alarm Systems, 2013 Edition

- 29.7.7 Combination Systems
 - Allows single- or multiple-station smoke alarms to be connected to household fire warning systems
 - Allows sprinkler waterflow switch to be connected to multiple-station alarms or household fire alarm system to activate an alarm signal.

Questions?

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