NFPA 72® Code Changes - 2010 vs 2013

AFAA-NE
Westborough, MA

February 7, 2018 Richard Roux
NFPA 72® National Fire Alarm and Signaling Code Overview and 2013 Changes
NFPA 72

- 2010 Edition Aug 26, 2009
NFPA 72-2013 Changes
NFPA 72-2013

- Report on Proposals (ROP)
  - 379 Pages – 833 Proposals

- Report on Comments (ROC)
  - 283 Pages – 525 Comments
Major Changes for 2013

- AFAA-NE
- Completion of the organizational changes to the Code
- New Chapters, including
  - Emergency Communications Systems
  - Mass Notification Systems
- Reorganized Chapter 10
- A more user-friendly Chapter 14
- Documentation Requirements
- Testing & Services personnel qualification requirements
Presentation Convention

– Red is new/revised
– Black for existing text or comment
– **Bold/Bold** for emphasis
Chapter Organization

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

- Administrative Chapters 1 - 9
  - 1 Administration
  - 2 Referenced Publications
  - 3 Definitions
  - 7 Documentation
  - 4 – 6 & 8 – 9 Reserved
Support Chapters

- 10 Fundamentals
- 12 Circuits and Pathways
- 14 Inspection, Testing & Maint.
- 17 Initiating Devices
- 18 Notification Appliances
- 11, 13, 15, 16 & 19 Reserved
System Chapters

- 21 Emergency Control Function Interfaces
- 24 Emergency Communications Systems (ECS)
- 26 Supervising Station Alarm Systems
- 27 Public Emerg. Alarm Reporting Systems
- 28 Reserved
- 20, 22, 25, 28 Reserved
- 23 Protected Premises Fire Alarm Systems
- 29 SS/MS & Household Fire Alarm Systems

System Chapters 20 – 29
Usability Annexes

- Annex A: Explanatory Material
- Annex B: Engineering Guide
- Annex C: System Performance & Design Guide
- Annex D: Speech Intelligibility
- Annex E: Sample Ordinance
- Annex F: Wiring Diagrams
- Annex G: Informational References
- Index
NFPA 72-2013
Chapter 7
Documentation
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 Inspection, Testing, and Maintenance Documentation
- 7.7 Records, Record Retention, and Record Maintenance
- 7.8 Forms
Chapter 7 Documentation

- 7.1 Application
  - 7.2 Min. Required Documentation
  - 7.3 Design (Layout) Documentation
  - 7.4 Shop Drawings (Inst. Documentation)
  - 7.5 Completion Documentation
  - 7.6 Insp., Testing & Maint. Documentation
  - 7.7 Records
  - 7.8 Forms
Chapter 7 Application

• 7.1.1 **New** systems must comply with the minimum requirements of this chapter

• 7.1.2 **Existing** systems (previously installed) must comply with the minimum requirements of this chapter

7.1.1 **New** systems must comply with the minimum requirements of this chapter
7.1.2 **Existing** systems (previously installed) must comply with the minimum requirements of this chapter
Minimum Required Documentation

• Where documentation is required by the enforcing authority, 7.2.1 provides the list that represents the minimum documentation required for all fire alarm and emergency communications systems, including new systems and additions or alterations to existing systems.
Minimum Required Documentation 7.2.1

1) Written narrative
2) Riser diagram
3) Floor plan
4) Sequence of operation (matrix or narrative)
5) Equipment data sheets
6) Manufacturers published instructions
7) Battery calculations
8) Voltage drop calculations
9) Completed record of inspection and testing
10) Completed record of completion
11) Copy of site-specific software
12) Record (as-built) drawings
13) Periodic inspection, testing, and maintenance documentation per 7.6
14) Records, record retention, and record maintenance per 7.7
Drawing Symbols

• All fire alarm drawings must use symbols described in NFPA 170, *Standard for Fire Safety and Emergency Symbols*, or other symbols acceptable to the AHJ.
Other Documentation

- 7.3 Design (Layout) Documentation
- 7.3.9 Evaluation documentation
- To include a signed statement by the person responsible for the design attesting to the evaluation
- Evaluation documentation **to be retained for the life of the system and be maintained** in the documentation cabinet

**Evaluation documentation by 23.4.3.1**
- Class of pathways (A, B, X)
- Determine the integrity and reliability of the interconnecting signaling paths (circuits)
- Results of the evaluation documented

**Documentation per 23.10.2** to ensure survivability for systems used for partial evacuation or relocation (includes tone and coded systems)

**Evaluation documentation by 24.4.3.24.2**
- That the PA system has been evaluated and meets the performance requirements of Chapter 24 and the emergency response plan
Other Documentation

• 7.5 Completion Documentation
• Includes:

  1) An **owner’s manual** and manufacturer’s published instructions

  2) Record (as-built) drawings

  3) Completed record of completion

  4) Record copy of the site-specific software

  1) Detailed narrative description of inputs, evacuation signaling, ancillary functions, annunciation

  2) Written sequence of operation

  3) Operator instructions for basic system

  4) Detailed description of routine maintenance and testing:

     a) List of individual system components that require periodic testing and maintenance

     b) Step-by-step instructions with testing and maintenance procedures, and the intervals

     c) A schedule that correlates the testing and maintenance procedures

  5) Service directory with names and telephone numbers for service
Other Documentation

7.5 Completion Documentation

Includes:
1) An owner’s manual and manufacturer’s published instructions
2) Record (as-built) drawings
3) Completed record of completion
4) Record copy of the site-specific software

Current updated shop drawings reflecting the actual installation
Sequence of operations in input/output matrix or narrative form to reflect actual programming
Revised calculations depicting any changes due to installation conditions
Approval documentation resulting from variances, performance-based designs, risk analyses, and other system evaluations or variations
Other Documentation

- 7.5 Completion Documentation
- Includes:
  1) An owner’s manual and manufacturer’s published instructions
  2) Record (as-built) drawings
  3) Completed record of completion
  4) Record copy of the site-specific software

Documentation to be:
- Updated to reflect all system additions or modifications
- Maintained in a current condition at all times
- Maintained in the documentation cabinet in accordance with 7.7.2
- Where the original document cannot be obtained, a new system record of completion to be provided that documents the system configuration as discovered during the current project’s scope of work
Other Documentation

- 7.5 Completion Documentation

Includes:

1) An owner’s manual and manufacturer’s published instructions

2) Record (as-built) drawings

3) Completed record of completion

4) Record copy of the site-specific software

Documented per 7.5.6 using the record of completion forms:

- Figure 7.8.2(a) through Figure 7.8.2(f), OR
- An alternative document that contains only the elements of Figure 7.8.2(a) through Figure 7.8.2(f)

Completed by the installing contractor and submitted to the enforcing authority and the owner upon conclusion.
Other Documentation

- 7.5 Completion Documentation
- Includes:
  1) An owner’s manual and manufacturer’s published instructions
  2) Record (as-built) drawings
  3) Completed record of completion
  4) Record copy of the site-specific software

In accordance with 14.6.1.2
Copy provided to owner or owner’s designated rep
Stored on-site in nonvolatile, nonerasable, nonrewritable memory
System owner is responsible for maintaining these records for the life of the system for examination by the AHJ
Other Documentation

- 7.6 Inspection, Testing, and Maintenance Documentation
- **Required** as minimum per 7.2

Documented per 7.6.6 using the record of inspection and testing forms:
- Figure 7.8.2(g) through Figure 7.8.2(l), **OR**
- An alternative document that contains all the applicable information of Figure 7.8.2(g) through Figure 7.8.2(l)
Other Documentation

- 7.8.2(g) System Record Of Inspection And Testing
- 7.8.2(h) Notification Appliance Supplementary Record Of Inspection And Testing
- 7.8.2(i) Initiating Device Supplementary Record Of Inspection And Testing
- 7.8.2(j) Mass Notification System Supplementary Record Of Inspection And Testing
- 7.8.2(k) Emergency Communications Systems Supplementary Record Of Inspection And Testing
- 7.8.2(l) Interface Component Supplementary Record Of Inspection And Testing
- Forms available in Word at nfpa.org
Other Documentation

- 7.7 Records, Record Retention, and Record Maintenance
  - Records
  - Document accessibility
  - Document security
  - **Required** as minimum per 7.2

Record of all tests and operations to be retained for next test and 1 year
Records to be available for examination by the AHJ
Archiving (electronic) of records is permitted if hard copies of the records can be provided promptly when requested
If off-premises monitoring is provided, records of all signals, to be retained for 1 year minimum
Documents regarding system design and function to be maintained for the **life of the system**
Other Documentation

• 7.7 Records, Record Retention, and Record Maintenance
• Records
• Document accessibility
• Document security

For new system, documentation cabinet to be installed at the system control unit or at another approved location at the protected premises.

All record documentation to be stored in the documentation cabinet.

Where cabinet is not in the same location as the system control unit, its location identified at the system control unit.

Documentation cabinet must be prominently labeled SYSTEM RECORD DOCUMENTS.

Cabinet to be accessible by authorized personnel only.
Other Documentation

- 7.7 Records, Record Retention, and Record Maintenance
- Records
- Document accessibility
- **Document Security (MNS)**

Security for system documentation to be determined by the stakeholders. Where such documents cannot be protected from public access, it is permitted to remove sensitive information from record documents provided the owner retains complete documentation that will be made accessible to the AHJ at an owner designated location.
Fundamentals

2013 (p 72-65)

Personnel Qualifications

– System Designer – No change
– System Installer – No change
– Inspection, Testing, and Service Personnel
  • Inspection Personnel – by persons who developed competence by training and experience
  • Testing Personnel – by persons with knowledge and experience of the testing requirements
  • Service Personnel – No change
  • Programming Personnel – shall be certified by the system manufacturer
Distinctive Signals

- Alarm evacuation signals shall be distinctive in sound from other signals, shall comply with the requirements of 18.4.2, and their sound shall not be used for any other purpose.

- 18.4.2 Distinctive Evacuation Signal
  - The alarm audible signal pattern used to notify building occupants of the need to evacuate (leave the building) or relocate (from one area to another) shall be the standard alarm evacuation signal consisting of a three-pulse temporal pattern.
Distinctive Signals

- Pre-alarm signals shall be distinctive in sound from other signals, and their sound shall not be used for any other purpose except as permitted in 10.10.4

- 10.10.4 An audible notification appliance on a control unit, or on multiple control units that are interconnected to form a system, or at a remote location, shall be permitted to have the same audible characteristics for all alerting functions including, but not limited to, alarm, trouble, and supervisory, provided that the distinction between signals shall be by other appropriate means, such as visible annunciation
Alarm Signals

• An alarm signal that has been deactivated at the protected premises shall comply with 10.12.6.1 and 10.12.6.2

• 10.12.6.1 The audible and visible alarm signal at the control unit only shall automatically reactivate every 24 hours or less until alarm signal conditions are restored to normal

• 10.12.6.2 The audible and visible alarm signal shall operate until it is manually silenced or acknowledged

• NFPA 72-2010 had similar provisions but only for trouble conditions; the 2013 now extends requirements to alarm conditions
Fire Alarm Notification Appliance Deactivation

- When an occupant notification alarm signal deactivation means is actuated, **both audible and visible** notification appliances **shall be simultaneously deactivated**
- When voice instructions are in progress, **visible appliances** in same area where speakers are activated **shall also be activated where required by the emergency response plan**
- The fire alarm notification **deactivation means** shall be key-operated or located within a locked cabinet, or arranged to provide equivalent **protection against unauthorized use**
NFPA 72-2013
Chapter 14
Inspection, Testing, and Maintenance
Chapter 14

- Extensive chapter structure changes
- Improves user friendliness
- 14.2 Purpose added

2013 (p 72-75)
Inspection, Testing, and Maintenance

• Initial and reacceptance
  – To ensure compliance with approved design documents and to ensure installation in accordance with this Code and other required installation standards
  – To ensure system operation in accordance with the design documents
  – New work or modifications

Periodic
  Performed at prescribed intervals (W, M, Q, S, A)

Periodic inspections
  To assure that obvious damages or changes (building or environment) that might affect the system operability are visually identified

Periodic testing
  To statistically assure operational reliability
Inspection, Testing, and Maintenance

- NFPA 72-2010
- Visual Inspection Frequencies
- Test Methods
- Testing Frequencies

- NFPA 72-2013
- Visual Inspection/Method
- Testing/Method
NFPA 72-2013
Chapter 17
Initiating Devices
Detector Location Requirements

- 4" SPOT
- 20" LINE
- 12" SPOT
- 20" LINE

Ceiling
- 4"

OK
- 4"

DEAD AIR SPACE NOT OK

OK

Wall
Manual Fire Alarm Boxes

- Single-action
- Double-action
- Break-glass
- Addressable
- Nonaddressable
Protective Cover
NFPA 72-2013
Chapter 23
Protected Premises Fire Alarm Systems
Performance of SLCs

- A single fault on a pathway connected to the addressable devices shall not cause the loss of more than 50 addressable devices
  - The intent is to clarify that this requirement applies only to SLCs that connect to addressable devices and not to SLCs that interconnect fire alarm control units
Isolation modules must be integral or installed in close proximity to the control unit.
NFPA 72-2013
Chapter 24
Emergency Communications Systems
Emergency Communications Systems

2013 (p 72-125)

• Listing

• Control units installed as part of a mass notification system shall be in compliance with this Code and applicable standards such as
  – ANSI/UL 864, Standard for Control Units and Accessories for Fire Alarm Systems
  – ANSI/UL 2017, Standard for General-Purpose Signaling Devices and Systems
  – ANSI/UL 2572, Mass Notification Systems
Emergency Communications Systems

2013 (p 72-125)

- Risk Analysis for Mass Notification Systems
- The risk analysis shall include a review of the extent to which occupants and personnel are notified, based on the anticipated event (potential hazard) – relocated from 24.7.7.5
- The risk analysis shall be used as the basis for development of the ECS provisions of the facility emergency response plan
Emergency Communications Systems
In-Building MNS

- Voice Message Priority
- When identified by the emergency response plan, messages from the mass notification system shall be permitted to take priority over fire alarm messages and signals
Emergency Communications Systems
In-Building MNS

2013 (p 72-130)

• Volume Control
• Local controls shall be permitted to adjust volume levels of ancillary functions
Visible Appliances

The spacing of colored strobes shall be in accordance with public mode spacing requirements of Section 18.5 using the effective intensity as the basis for spacing.

18.5 Visible Characteristics — Public Mode

Where strobes are used solely for mass notification, the word “ALERT” shall be stamped or imprinted on the appliance and be visible to the public.
NFPA 72-2013
Chapter 26
Supervising Station Alarm Systems
Supervising Station Systems

2013 (p 72-138)

• Change of Service

• Supervising station customers or clients and the AHJ shall be notified in writing within 30 days of any scheduled change in service that results in signals from the client’s property being handled by a different supervising station

• Service Termination

• The supervising station shall notify the AHJ prior to terminating service
Supervising Station Systems

2013 (p 72-144)

• Communications Methods for Supervising Station Alarm Systems

• The minimum signaling requirement shall be an alarm signal, a trouble signal, and a supervisory signal, where used
Supervising Station Systems

2013 (p 72-145)

- Communications Methods for Supervising Station Alarm Systems
- The communications methods used to transmit signals to supervising stations shall meet the requirements of 26.6.3.1 for performance-based technologies, or 26.6.3.2 or 26.6.3.3 for prescriptive-based technologies
  - 26.6.3.1 Performance-Based Technologies (General)
  - 26.6.3.2 Digital Alarm Communicator Systems
  - 26.6.3.3 Radio Systems
Communications Methods

Performance-Based Technologies
- Single Communications Path OR
- Multiple Communications Path

Digital Alarm Communicator Transmitter (DACT)
- Primary one telephone line (number) AND
- Secondary

Radio Systems
- One-Way Private Radio Alarm Systems OR
- Two-Way Radio Frequency (RF) Multiplex Systems

Transmission means complying with 26.6.3.1 Performance-Based Technologies
Supervising Station Systems

2013 (p 72-145)

• Performance-Based Technologies

• 26.6.3.1.1 Conformance. Communications methods operating on principles different from specific methods covered by this chapter shall be permitted to be installed if they conform to the performance requirements of this section and to all other applicable requirements of this Code
Supervising Station Systems

2013 (p 72-145)

• Performance-Based Technologies

• 26.6.3.1.5 Single Communications Path. *Unless prohibited* by the enforcing authority, governing laws, codes, or standards, a single transmission path shall be permitted, and the *path shall be supervised at an interval of not more than 60 minutes*. A failure of the path shall be annunciated at the supervising station within not more than 60 minutes. The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15

• 10.15 Trouble Signals
Supervising Station Systems

2013 (p 72-145)

• Performance-Based Technologies
• 26.6.3.1.6 Multiple Communications Paths. If multiple transmission paths are used, the following requirements shall be met:
  1) Each path shall be supervised within not more than 6 hours
  2) The failure of any path of a multipath system shall be annunciacted at the supervising station within not more than 6 hours
  3) The failure to complete a signal transmission shall be annunciacted at the protected premises in accordance with Section 10.15
• 10.15 Trouble Signals
Supervising Station Systems

2013 (p 72-145)

• Performance-Based Technologies

• 26.6.3.1.7 Single Technology. A single technology shall be permitted to be used to create the multiple paths provided the requirements of 26.6.3.1.6(1) through 26.6.3.1.6(3)

• A.26.6.3.1.7 When considering a fire alarm system utilizing a single communication path to the supervising station, consideration should be given to the risk exposure that results from the loss of that path for any period of time and for any reason. Some of these outages can be regular and predicable and others transitory
Supervising Station Systems

2013 (p 72-146)

• Performance-Based Technologies
• Sharing Communications Equipment On-Premises
• If the fire alarm transmitter is sharing on-premises communications equipment, the shared equipment shall be listed as communications or information technology equipment
Supervising Station Systems

2013 (p 72-146)

- Performance-Based Technologies
- Secondary Power
- Premises Equipment. Secondary power capacity for all equipment necessary for the transmission of alarm, supervisory, trouble, and other signals located at the protected premises shall be as follows:
  1) Fire alarm transmitters **not** requiring **shared** on-premises communications equipment shall comply with 10.6.7
     - 10.6.7 Secondary Power Supply
Supervising Station Systems

2013 (p 72-146)

• Performance-Based Technologies
• Secondary Power

2) If the fire alarm transmitter is sharing on-premises communications equipment, the shared equipment shall have a secondary power capacity of 24 hours

  – Exception: Secondary power capacity for shared equipment shall be permitted to have a capacity of 8 hours where acceptable to the authority having jurisdiction and where a risk analysis is performed to ensure acceptable availability is provided
Supervising Station Systems

2013 (p 72-146)

• Digital Alarm Communicator Systems
• 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) One-way private radio alarm system
  2) Two-way RF multiplex system
  3) Transmission means complying with 26.6.3.1
  • 26.6.3.1 Performance-Based Technologies
• Exception – continued on next slide
Supervising Station Systems

2013 (p 72-146)

- Digital Alarm Communicator Systems
- Transmission Channels
- 
  Exception: Where access to two technologies in the preceding list is not available at the protected premises, with the approval of the AHJ, a telephone line (number) shall be permitted to be used as the second transmission means. Each DACT shall be programmed to call a second DACR line (number) when the signal transmission sequence to the first called line (number) is unsuccessful. The DACT shall be capable of selecting the operable means of transmission in the event of failure of the other means. Where two telephone lines (numbers) are used, it shall be permitted to test each telephone line (number) at alternating 6-hour intervals.
NFPA 72-2013 Changes
Thank You!
2013 (p 72-168)

• **29.8.3.4 Specific Location Requirements.** The installation of smoke alarms and smoke detectors shall comply with the following requirements:
Supervising Station Systems

2013 (p 72-168)

• (4)*Smoke alarms and smoke detectors shall not be installed within an area of exclusion determined by a 10 ft (3.0 m) radial distance along a horizontal flow path from a stationary or fixed cooking appliance, unless listed for installation in close proximity to cooking appliances. Smoke alarms and smoke detectors installed between 10 ft (3.0 m) and 20 ft (6.1 m) along a horizontal flow path from a stationary or fixed cooking appliance shall be equipped with an alarm-silencing means or use photoelectric detection.
Supervising Station Systems

2013 (p 72-168)

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

EXCEPTION: If the 10 ft exclusion prohibits an installation, put a photoelectric detector at least 6 ft from the cooking appliances.

29.8.3.4