

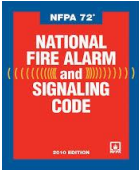
South Dakota Building Officials Association

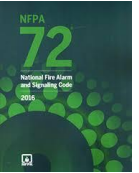
**Significant Changes to NFPA 72 –
Impacting the Code Official,
Designer and Contractor**

SOUTH DAKOTA BUILDING OFFICIALS' ASSOCIATION
— An Affiliate of the South Dakota Municipal League —

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Significant Changes to NFPA 72





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Who am I?

- Inspector/Plans Examiner
- Deputy State Fire Marshal (MN)
- MN State Fire Chiefs Code Committee
- NFPA 72 Technical Committee
- Instructor for National Fire Academy technical fire prevention curriculum
- Appointed by MN Gov. Mark Dayton to Board of Architecture & Engineering (2013)




FIRE & LIFE SAFETY CONSULTING

Fire & Life Safety Interests...


- Fire Alarm Systems



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Fire & Life Safety Interests...

- Fire Alarm Systems
- School Fire Safety




FIRE & LIFE SAFETY CONSULTING

Fire & Life Safety Interests...

- Fire Alarm Systems
- School Fire Safety
- Autism/Fire & Life Safety






FIRE & LIFE SAFETY CONSULTING

Introductions

- Please introduce yourself:
 - Department/City (if applicable)?
 - Years of experience in your industry?
 - Years of experience designing/inspecting/reviewing fire alarm systems?

Welcome



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Miscellaneous Information

- Restrooms
- Breaks
- Roster
- Informal
- Participate
- Please ask questions



"You're not allowed to use the sprinkler system to keep your audience awake."

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ICC Preferred Provider

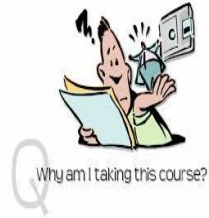
- This course has been approved by the International Code Council's Preferred Provider Program for 3.5 hours of continuing education.
- Please sign roster (if certified through ICC)



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Learning Objectives/Goals

- Gain a better understanding of fire alarm systems
- Scope and layout of NFPA 72, 2010 Edition
- What's coming in future editions
- That you learn something new



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Agenda

- Review the changes from the 2007 to the 2013 editions
- Cover new chapters
- Address what is coming in the 2016 and 2019 editions



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Terminology

- The term "alarm" refers to a single station device:
 - Not part of a system,
 - Intended to alert the occupant,
 - Examples: smoke alarms, CO alarms,
- The term "detector" refers to a device connected to a fire alarm system.
 - A detector does not alert the occupant (horn/strobes do that)



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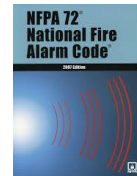
Editorial Remarks

- Asterisk (*) indicates annex material
- Vertical line indicates new/changed material
- Bullet indicates material removed
- [XXX-XXX] indicates committee responsible for definitions
- Brackets [] indicate material extracted from another NFPA document

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NFPA 72 – 2007 Edition

- NFPA 72 – 2007
 - National Fire Alarm Code



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NFPA 72 – 2013 Edition

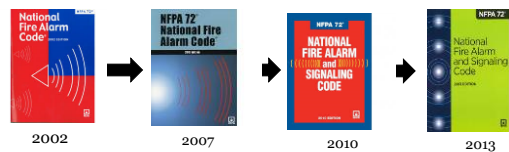
- NFPA 72 – 2013
 - National Fire Alarm and Signaling Code

- Introduction
- Chapters 1-3 (Administrative)
- Chapters 10-19 (Support)
- Chapters 20-29 (Systems)



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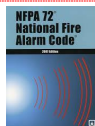
What Changed???



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2007 Edition/NFPA 72

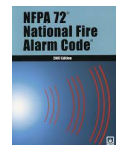
- Chapter 1-Administration
- Chapter 2-Referenced Standards
- Chapter 3-Definitions
- Chapter 4-Fundamentals of Fire Alarm Systems
- Chapter 5-Initiating Devices
- Chapter 6-Protected Premises Fire Alarm Systems



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2007 Edition/NFPA 72

- Chapter 7-Notification Appliances
- Chapter 8-Supervising Station
- Chapter 9-Public Fire Alarm Reporting
- Chapter 10-Inspection, Testing & Maintenance
- Chapter 11-Single/Multiple Station Alarm and Household Fire Alarm Systems



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New Format: 2007 – 2013



2002/2007 editions had 11 chapters



2010/2013 editions have 29 chapters

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NFPA 72, 2013 – Format

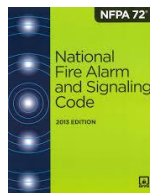
- Chapters 1-2-3
 - Administration
 - Referenced Publications
 - Definitions
- Chapters 4-9
 - Reserved
- Chapter 10
 - Fundamentals



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NFPA 72, 2013 – Format

- Chapter 11
 - Reserved
- Chapter 12
 - Circuits and Pathways
- Chapter 13
 - Reserved
- Chapter 14
 - Inspection, Testing & Maintenance



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NFPA 72 – Format

- Chapters 15-16
 - Reserved
- Chapter 17
 - Initiating Devices
- Chapter 18
 - Notification Appliances
- Chapters 19-20
 - Reserved



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NFPA 72 – Format

- Chapter 21
 - Emergency Control Functions and Interfaces
- Chapter 22
 - Reserved
- Chapter 23
 - Protected Premises Fire Alarm Systems
- Chapter 24
 - Emergency Communication Systems - **New**



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NFPA 72 – Format

- Chapter 25
 - Reserved
- Chapter 26
 - Supervising Stations Fire Alarm Systems
- Chapter 27
 - Public Emergency Alarm Reporting Systems
- Chapter 28
 - Reserved



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NFPA 72 – Format

- Chapter 29
 - Single – Multiple Station Alarms and Household Fire Alarm Systems
- Annexes (Not enforceable language)
 - A – Explanatory Material
 - B – Engineering Guide for Automatic Fire Detector Spacing
 - C – System Performance and Design Guide
 - D – Speech Intelligibility

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NFPA 72 – Format

- Annexes (cont.)
 - E – NEMA SB30 – Fire Service Annunciator and Interface
 - F – Sample Ordinance
 - G – Guide for Testing of Circuits
 - H – Informational References
 - I – Cross-Reference Table



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Terminology Changes

- “FIRE” removed or changed to “EMERGENCY” in most cases
 - Example: “manual fire alarm box” is now “manual alarm box”.
- Where “FIRE” is integral to the meaning of the text, it was not changed
 - Example: “fire department”

FIRE

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Chapters 1-2-3

- Chapter 1
 - Administration
- Chapter 2
 - Referenced Publications
- Chapter 3
 - Definitions



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Chapter 1 – Section 1.4

- Retroactivity
 - Continues language that the standard only applies once adopted.
 - Exception for conditions where the AHJ determines a distinct hazard
 - It is necessary for the AHJ to research previous editions when applicable.

Effective Date
Compliance Date

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Chapter 1 – Section 1.5

- Equivalency Section 1.5
 - Nothing in the standard shall prevent the use of systems, methods, devices, or appliances of equivalent or superior quality, strength, fire resistance, effectiveness, durability and safety over those prescribed in the standard
 - Fire alarm technology changes rapidly!



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Chapters 1-2-3

- Chapter 1 (continued)
- **1.6.5** *The values presented for measurements in this Code are expressed with a degree of precision appropriate for practical application and enforcement. It is not intended that the application or enforcement of these values be more precise than the precision expressed.*

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Chapters 1-2-3

- John's Interpretation
 - Use some common sense when measuring.
 - There is no exact science regarding many of the dimensions listed in the standard (examples to come).



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Important New Definitions

- Acoustically Distinguishable Spaces
 - Applicable to emergency communication systems
- Several new definitions for emergency communication systems and the different types (one-way, in-building, wide area, etc.)
- Dedicated Function Fire Alarm Control Unit

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New Definitions

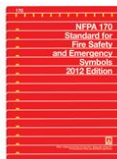
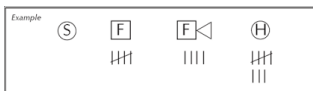
- Managed Facilities-Based Voice Network
 - Added to allow the continued use of DACTs with certain conditions
- Risk Analysis



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Fire Alarm Plan Symbols

- Section 7.2.3 (13)-Requires all symbols on fire alarm drawing plan submittals to comply with NFPA 170, *Standard for Fire Safety and Emergency Symbols*



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Chapter 10 - Fundamentals

- Protection of Fire Alarm Systems
- Qualifications-Designer/Installer/Supervising station operators
- Primary/Secondary Power Supplies
- Annunciation and Annunciation Zoning
- Monitoring Integrity
- Documentation
- Impairments



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Chapter 10 - Qualifications

- 10.5 Personnel Qualifications
 - Revised and added requirements for personnel qualifications for:
 - System designers
 - System installers
 - Inspection/Testing/Maintenance Personnel
 - Supervising Station operators (added in 2010)
 - Inspectors/Plans Examiners – **2016 Edition**

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Chapter 10 – Fundamentals

- Supervising Station Operators-Added in 2010
 - Operators in supervising station shall demonstrate competence in all tasks as required by chapter 26. Including...
 - Certified by the manufacturer of the receiving system or equipment or the alarm monitoring automation system.



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Chapter 10 – Fundamentals

- Supervising Station Operators (Cont.)
 - Operators in supervising station shall demonstrate competency in all tasks as required by chapter 26. Including...
 - Certified by an organization acceptable to the AHJ
 - Ex. Central Station Alarm Association
 - Licensed or certified by the state or local AHJ
 - Other training or certification approved by the AHJ

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Chapter 10 -Fundamentals

- Language for 2016 Edition of NFPA 72
- Establish a minimum standard for inspectors and plans examiners that inspect and review fire alarm/ECS systems



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AHJ/Plans Examiner Qualifications

- 2016 Edition
- Section 10.5.4.3-Code officials who perform plan review services shall meet one or more of the following:
 - (1) Personnel who are registered, licensed, or certified by a state or local authority
 - (2) Personnel who meet the requirements of NFPA 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiner*
 - (3) Personnel who are assigned to perform plan reviews and inspections by the authority having jurisdiction

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Chapter 10 - Changes

- 10.6 Signal Priority – Changed in 2010 Ed.
 - Signals need to be prioritized as follows:
 1. Emergency Communication System
 2. Fire
 3. Supervisory
 4. Trouble
 - Note that ECS is not prioritized all the time, but based on a risk analysis
 - See definition of Risk Analysis in Chapter 3



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Chapter 10-Change

• 10.6 Signal Priority – 2013 Edition

- Signals need to be prioritized as follows:
 1. Emergency Communication System
 2. Fire
 3. Pre-Alarm/Carbon Monoxide Alarm
 4. Supervisory
 5. Trouble

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Chapter 10 (13) – Fundamentals

• New Pre-Alarm signal language

- Pre-Alarm Condition-“An abnormal condition that poses an immediate threat to life, property or mission”.
 - Ex: Heat detector sending a signal to the panel when ceiling temperature reaches 130°F
- Intent is to give building owner/staff additional time to investigate possible issue before initiating devices reach alarm condition.

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Chapter 10 (13) – Fundamentals

• New Pre-Alarm signal language

- Newer technology panels have pre-alarm capability
 - This is in addition to alarm, supervisory and trouble
 - This is different from alarm verification (will discuss later)
- Panel will notify building owner by text/email of condition *about* to happen

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Coded Alarm Signals

• Section 10.9.4-Each round of a coded alarm signal shall consist of not less than three impulses.

- Coded alarms are typically used in areas/buildings where private notification is desired (hospitals, nursing homes, etc.)
- Ex. “Paging Dr. Firestone, Dr. Firestone, Building 4 West Wing”

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Trouble Signals

• Section 10.12.8.3-An audible trouble signal that has been silenced at the protected premises shall comply with the following:

- Signal shall automatically re-sound every 24 hours or less until fault condition is restored.
- The signal shall sound until it is manually silenced or acknowledged.
- The trouble signal shall be automatically retransmitted to the supervising station when provided

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Chapter 10 -Fundamentals

• 10.10 Alarm Signal Deactivation

- Requirement to deactivate both audible and visible signaling when silencing a fire alarm system.
- Silencing just the horns is a violation of ADA regulations.



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Chapter 10 – Fundamentals

- 10.14.3 Initiating Devices (manual and automatic) shall be selected and installed so as to minimize the possibility of nuisance alarms.
 - Pay close attention to where initiating devices are being placed on plans.



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Chapter 10 - Changes

- Protection of Control Equipment
 - In areas that are not continuously occupied, automatic smoke detection is required at all fire alarm control panels, NAC power panels and supervising station transmission equipment.
 - Exception for fully sprinklered buildings (2007 edition) has gone away

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Initiating Devices

- FAQ: Can a heat detector be used when ambient conditions prohibit a smoke detector?



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Initiating Devices

- FAQ: Can a heat detector be used when ambient conditions prohibit a smoke detector?
 - ANSWER: Yes; however, if ambient conditions are not suitable for a smoke detector, it often is not suitable for control equipment either.

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Chapter 12 – Circuits and Pathways

- Application
- General
- Pathway Class Designation
- Pathway Survivability
- Terminology

TERMINOLOGY

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Section 12.2 - General

- Chapter 12 is a NEW chapter in 2010
- Chapter 12 has no requirements
- Chapter 12 describes pathway classifications and pathway survivability levels
- Other chapters refer to Chapter 12 for reference.

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Chapter 14 – Inspection, Testing and Maintenance

- Application
- General
- Inspection
- Testing
- Maintenance
- Records



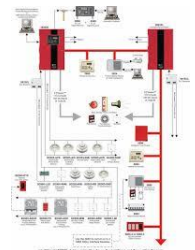
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Chapter 14 – Inspection, Testing & Maintenance

For a fire alarm system to be reliable, it must be:

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Properly Designed



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Properly Installed



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Properly Maintained



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Inspection, Testing and Maintenance

- Chapter 14 is the only chapter in the standard that applies to new and existing fire alarm system installations.
- It is the owner's responsibility to ensure ITM is provided for the system.



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Inspection, Testing and Maintenance

- Section 14.4.1 Test methods- Fire alarm systems and associated equipment shall be tested in accordance with Table 14.4.2.2.



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Inspection, Testing and Maintenance

- Section 14.6.1.2-Site-Specific Software-Many of the new fire alarm systems have specific software applications that must be provided by the installing contractor.



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Inspection, Testing and Maintenance

- A copy of this software must be provided to the owner and stored on-site.
- The owner of the building is responsible for maintaining the records.
 - If contractors do not have this information it can cause delays to any repairs that may be necessary.



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Chapter 17 – Initiating Devices



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Chapter 17 – Initiating Devices

- Application
- Purpose
- Performance-Based Design
- General Requirements
- Requirements for Smoke and Heat Detectors
- Heat-Sensing Fire Detectors



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Chapter 17 – Initiating Devices

- Smoke-Sensing Fire Detectors
- Radiant-Energy Sensing Fire Detectors
- Combination, Multi-Criteria and Multi-Sensor Detectors
- Gas Detection
- Other Fire Detectors



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Chapter 17 – Initiating Devices

- Sprinkler Water-flow Alarm Initiating Devices
- Detection of the operation of Other Automatic Extinguishing Systems
- Manually Actuated Alarm-Initiating Devices
- Fire Extinguisher Electronic Monitoring Devices
- Supervisory Signal Initiating Devices

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Chapter 17 – Initiating Devices

- Covers the installation criteria for all sensors or devices that are used to provide recognition of a fire
- Chapter covers any device that provides an incoming signal to the fire alarm control panel
- Installation criteria for single & multiple station smoke alarms are found in chapter 29.

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Chapter 17 – Initiating Devices

- It is important for the designer to understand basic fire chemistry when utilizing chapter 17.
- Fire and the products of combustion behave differently based on the size of the room, the ceiling layout, and the amount of combustible materials in the space.

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Detector Coverage

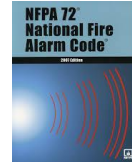
- **Total Coverage**-When required by laws, codes, or standards, ...includes all rooms, hallways, storage areas, basements, attics, spaces above suspended ceilings
 - Rare to require total coverage
- **Partial/Selective**-Where laws, codes, or standards require selected areas be covered
- **Nonrequired**-Devices installed to achieve a specific fire safety objective but not mandated by laws, codes or standards

NFPA 72 (10) Section 17.5.3

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Initiating Device Locations – 02/07 Edition

- **5.4.6** Initiating devices shall be installed in all areas, compartments, or locations where required by other NFPA codes and standards or as required by the authority having jurisdiction.



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Initiating Device Locations – 2013 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.



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Heat Detectors

- Heat detectors are not considered life safety equipment.
- Heat detectors should be installed where conditions are not favorable for smoke detectors such as kitchens, garages, boiler rooms, etc.
- The maximum ceiling temperature in the area where the heat detector is installed must be 20 degrees or more below the operating temperature of the heat detector.

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Heat Detectors & High Ceilings

TABLE 17.6.3.5.1 Heat Detector Spacing Reduction Based on Ceiling Height

Ceiling Height Greater than (->)		Up to and Including		Multiply Listed Spacing by
ft	m	ft	m	
0	0	10	3.0	1.00
10	3.0	12	3.7	0.91
12	3.7	14	4.3	0.84
14	4.3	16	4.9	0.77
16	4.9	18	5.5	0.71
18	5.5	20	6.1	0.64
20	6.1	22	6.7	0.58
22	6.7	24	7.3	0.52
24	7.3	26	7.9	0.46
26	7.9	28	8.5	0.40
28	8.5	30	9.1	0.34

Exception: Table 17.6.3.5.1 shall not apply to the following detectors, which rely on the integration effect:

- (1) Line-type electrical conductivity detectors (see 3.3.66.11)
 - (2) Pneumatic rate-of-rise tubing heat detectors (see 3.3.66.15)
- In these cases, the manufacturer's published instructions shall be followed for appropriate alarm point and spacing.

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Chapter 17 – Initiating Devices

- Section 17.7.1.8-Unless specifically approved and listed for specific environmental conditions, smoke detectors shall not be installed in the following locations:
 - Where temperature is below 32°F
 - Where temperature is above 100°F
 - Where relative humidity is above 93%
 - Air velocity > 300 ft./min.

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Chapter 17 – Initiating Devices

TABLE A.17.7.1.8 Environmental Conditions that Influence Smoke Detector Response

Protection	Air Velocity >300 ft/min (>91.44 m/min)	Altitude >3000 ft (>914.4 m)	Humidity >93% RH	Temp. <32°F > 100°F (<0°C>37.8°C)	Color of Smoke
Ion	X	X	X	X	O
Photo	O	O	X	X	X
Beam	O	O	X	X	O
Air sampling	O	O	X	X	O

X: Can affect detector response. O: Generally does not affect detector response.

Environmental Factors on Smoke Detectors

- Factors to consider that may affect smoke detector response:

- Moisture
- Combustion Products and Fumes
- Atmospheric Contaminants
- Engine Exhaust
- Heating Elements and Abnormal Conditions



Environmental Factors on Smoke Detectors

- Factors to consider that may affect smoke detector response:

Moisture

- Live steam
- Steam tables
- Showers
- Humidifiers
- Slop sink
- Humid outside air
- Water spray



Environmental Factors on Smoke Detectors

- Factors to consider that may affect smoke detector response:

Combustion Products and Fumes

- Chemical fumes
- Cleaning fluids
- Cooking equipment
- Cutting/welding
- Fireplaces
- Ovens



Environmental Factors on Smoke Detectors

- Factors to consider that may affect smoke detector response:

Engine Exhaust

- Diesel engines
- Gas engines
- Gasoline forklifts



Environmental Factors on Smoke Detectors

- Factors to consider that may affect smoke detector response:

Heating Elements with Abnormal Conditions

- Dust accumulation
- Improper exhaust
- Incomplete Combustion



Environmental Factors on Smoke Detectors

- Factors to consider that may affect smoke detector response:

Electrical Noise and Mechanical Influences

- Vibration
- Radiation
- Intense light
- Electrostatic discharge



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Environmental Factors on Smoke Detectors

- Factors to consider that may affect smoke detector response:

Airflow

- Gusts
- Excessive velocity



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Chapter 17 – Changes

- 17.7.1.11 Protection During Construction

- When smoke detectors are installed during construction, they need to be tested and calibrated or replaced.
- When detectors are not required during construction, they shall not be installed until after all the other construction trades have completed cleanup.



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Chapter 17 – Initiating Devices

- 17.7.3.1.3** If the intent is to initiate action when smoke/fire threatens a specific object or space, the detector shall be permitted to be installed in close proximity to that object or space.

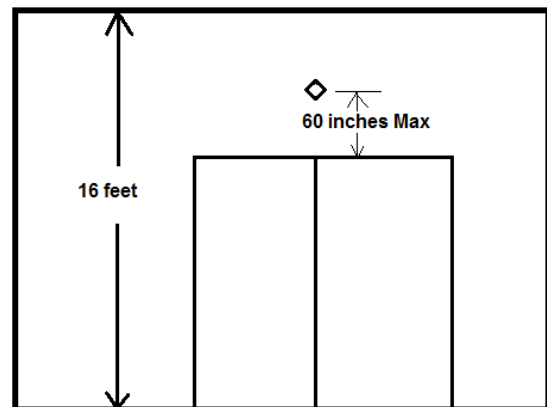


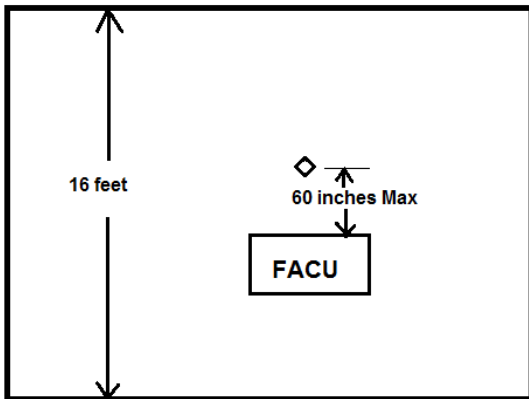
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Chapter 17 – Initiating Devices

- There are some applications that do not require full area protection where there are ceilings in excess of 15 feet:
 - Elevator landings
 - Protection of fire alarm control units
- Detection should be placed on the wall above and within 60 in. from the top of the elevator door(s) or FACU

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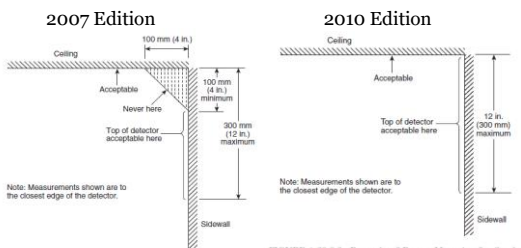
Chapter 17 – Changes

- 17.7.3.2 Smoke detector (or alarm) installation
 - Wall mounting permitted within 12" of ceiling
 - 4" dead space no longer in the code for smoke detectors
 - Exc. for sloped or peaked ceilings



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Wall-Mounted Smoke Alarms/Detectors



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Peaked Ceilings

A.29.8.3.1 Figure A.29.8.3.1 illustrates acceptable smoke alarm or smoke detector mounting locations for a peaked ceiling.

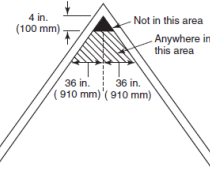


FIGURE A.29.8.3.1 Example of Proper Mounting for Alarms and Detectors with Peaked Ceilings.

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Sloped Ceilings

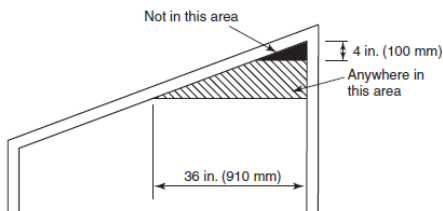


FIGURE A.29.8.3.2 Example of Proper Mounting for Alarms and Detectors with Sloped Ceilings.

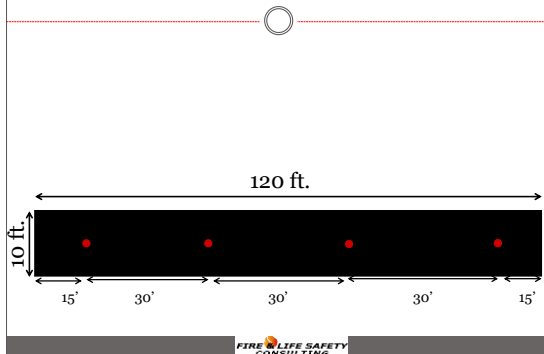
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Chapter 17 – Changes

- 17.7.3.2.3.1 Smoke Detector Spacing
 - Code language modified to clarify nominal spacing of smoke detectors
 - NFPA 72 (13) – “In the absence of specific performance-based design criteria, smooth ceiling smoke detector spacing shall be a nominal 30 feet.” OR
 - Use the “0.7 Rule”

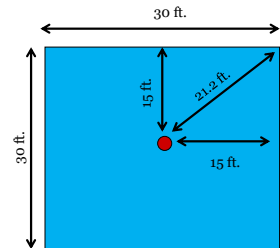
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Corridor Spacing



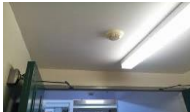
Detector Spacing - "The 0.7 Rule"

- The distance to the corner is more than 15 ft.
- $a^2 + b^2 = c^2$
- $15^2 = 225$
- $225 + 225 = 450$
- $\sqrt{450} = 21.2$ ft.
- 30 ft. $\times 0.7 = 21$ ft.



Smoke Detectors for Door Release

- NFPA 72 outlines two methods for controlling doors:
 - Door and shutter release mechanisms that are integral to the door hold-open release mechanism (see section 21.8)
 - Area smoke detectors



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Smoke Detectors for Door Release Service

- Section 17.7.5.6
 - If corridor is protected with smoke detection, no need for detection within 5 feet of door
 - Specific installation requirements depend on the depth of wall section (see section 17.7.5.6.5)



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Smoke Detectors for Door Release Service

- Section 17.7.5.6 (cont.)
 - If depth of wall section > 24 in. on one side only, one ceiling mounted smoke detection is required on the higher side
 - If the depth of wall section is > 24 in. on both sides, two ceiling mounted smoke detectors are required



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Smoke Detectors for Door Release

- Section 17.7.5.6.1-Smoke detectors that are part of an open area protection system covering the room, corridor, or enclosed space on each side of the smoke door and that are located and spaced as required by 17.7.3 shall be permitted to accomplish smoke door release service.

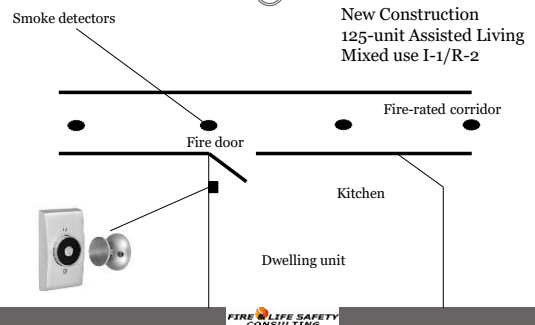
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Smoke Detectors for Door Release

- Section 17.7.5.6.1-Smoke detectors that are part of an open area protection system covering the room, corridor, or enclosed space on each side of the smoke door and that are located and spaced as required by 17.7.3 shall be permitted to accomplish smoke door release service.

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Smoke Detectors for Door Release-Scenario



Smoke Detectors for Door Release Service

- If separation between (multiple doorways is > 24 in., each doorway shall be treated separately



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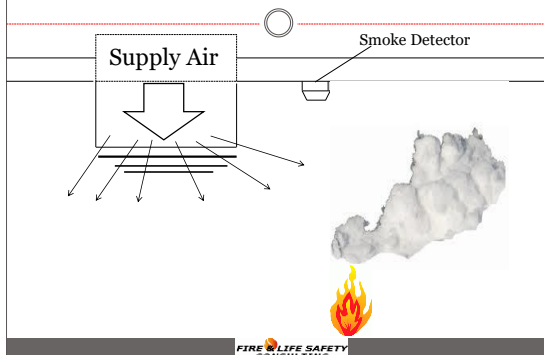
Smoke Detectors in High Air Movement Areas

- Section 17.7.6.3.2-Smoke detectors shall not be located directly in the airstream of supply registers.



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Smoke Detectors in High Air Movement Areas



Chapter 18 – Notification Appliances



Chapter 18 – Notification Appliances

- Application
- General
- Audible Characteristics
- Visible Characteristics – public mode
- Visible Characteristics –private mode
- Graphic Visible Signaling Method



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Notification Signal

- The type of notification signal must match the evacuation scheme for the facility:
 - Total evacuation,
 - Zoned evacuation,
 - Occupant relocation,
 - Defend in place strategies.
- Notification zones shall be consistent with the emergency response or evacuation plan for the protected premises.

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Chapter 18 – Notification Appliances

- The use of the T3 pattern shall only be used where evacuation of the building is desired/necessary.
- The T3 signal shall not be used where occupants are relocating within a building or they are practicing defend-in-place.



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Sound Levels – Public Mode

- 15 dBA above average ambient sound; or,
- 5 dBA above average ambient sound level lasting 60 seconds
- If ambient sound level is greater than 105 dBA, visual notification appliance is required,



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Sound Levels – Public Mode

- 110 dBA is maximum allowed



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TABLE A.18.4.3 Average Ambient Sound Level According to Location

Location	Average Ambient Sound Level (dBA)
Business occupancies	55
Educational occupancies	45
Industrial occupancies	80
Institutional occupancies	50
Mercantile occupancies	40
Mechanical rooms	85
Piers and water-surrounded structures	40
Places of assembly	55
Residential occupancies	35
Storage occupancies	30
Thoroughfares, high-density urban	70
Thoroughfares, medium-density urban	55
Thoroughfares, rural and suburban	40
Tower occupancies	35
Underground structures and windowless buildings	40
Vehicles and vessels	50

The Distance Effect on Sound Pressure Level

Distance from Appliance	Sound Pressure Level
10 ft. →	nameplate value
20 ft. →	- 6 dBA
40 ft. →	- 12 dBA
80 ft. →	- 18 dBA

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The Distance Effect on Sound Pressure Level

Speaker Rated at 84 dBA at 10 feet

10 ft. →	84 dBA
20 ft. →	78 dBA
40 ft. →	72 dBA
80 ft. →	66 dBA

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The Walls and Doors Effect on Sound

The Effect of Walls and Doors on Sound Transmission

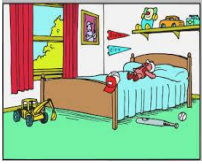
	Avg. Loss	Typical Range
Open Door	8 dBA	4-12 dBA
Closed Door	17 dBA	10-24 dBA
Sealed Door	28 dBA	22-34 dBA
Stud Wall	39 dBA	32-42 dBA

Source: NIST Handbook 119 "Quieting: A Practical Guide to Noise Control": D.A. Robinson, Univ. of MA, "Sound Transmission Loss From Corridors to Rooms: Implications for Locating Fire Alarm Sounders"

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Sound Levels – Sleeping Areas

- 15 dBA above ambient average sound level,
- 5 dBA above maximum sound level (lasting 60 seconds), or
- 75 dBA minimum measured at pillow level
- Whichever is greater.
- This will usually require an appliance in the dwelling unit.



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Alert Tones in Sleeping Areas



- Same for public and private operating mode
- 70 dBA min. 1999
- 75 dBA since 2002
- Remember, NFPA 72 is not a retroactive document
 - It is necessary to research the standard in effect at the time

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New Requirement for Frequency of Alert Tone for Awakening

- 520 Hz Square Wave
 - Systems (Chapter 18) – effective January 1, 2014
 - Household (Chapter 29) – effective on adoption



520 Hz Sq. Wave 3000 Hz

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Waking Effectiveness: High Risk Groups

-School aged children: Thirteen percent of civilian fire fatalities in residential buildings were under the age of 10 ¹

-Alcohol/drug impaired: It's suspected that over 27% of civilian fatalities in residential buildings are linked to alcohol, drug or chemical influence ¹

-People with hearing loss: More than 34.5 million people in the US are hard of hearing ²

Sources:

1. USFA, Civilian Fire Fatalities in Residential buildings 2008-2010 Report
2. Working Effectiveness of alarms for adults who are hard of hearing, NFPA Dorothy Bruck; Ian Thomas, June 2007

**Why the change?****• Background:**

- Study done by Victoria (Australia) University
- Study tried to determine why people were not waking to the fire alarm signal
- Nearly 50% of the participants with mild to severe hearing loss slept through the 3000 Hz smoke alarm signal
- The higher 3000 Hz signal also was not as effective at waking children

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Why the change?**• Background:**

- In the 1970s and early 1980s standard horns were replaced with low-current and more efficient high frequency horns.
- When this happened some stated they couldn't hear the newer alarms as well.
- Both devices measured 85 decibels at 10 feet;
- The issue was the frequency, not the sound output.



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Why the change?

- People with hearing loss have trouble hearing high frequencies than low.
- The 520 Hz square wave signal awoke nearly 100% of the participants in the test.
- Low frequency signal is 6-10 times more effective than the high frequency devices



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Why the change?

- Due to the results from the Victoria University study, in 2006, the Fire Protection Research Foundation (FPRF) funded two additional research studies on the issue
- Focus was on the effectiveness of the 3000 Hz tone on high risk groups
 - Waking effectiveness of alarms and adults who are hard of hearing
 - Waking effectiveness of alarms for the alcohol impaired



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FPRF Study**• The studies tested six signals:**

1. 400 Hz Square wave signal
2. 520 Hz Square wave signal
3. 3000 Hz pure tone (standard)
4. Bed shaker (under mattress)
5. Pillow shaker
6. Strobe light in T-3 pulse



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FPRF Conclusions

- The low frequency signal with a fundamental frequency of 520 Hz is the most effective signal for waking people.
 - Low frequency signal woke 92% between 55 dBA and 75 dBA
 - 3000 Hz signal woke 56% between 55 dBA and 75 dBA
- The low frequency signal is superior bed/pillow shakers and strobe lights.



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Do you recognize the Signal?



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In what occupancies will this apply?

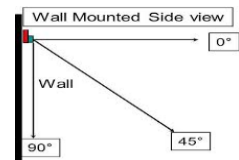
- Low frequency sounders will be required for new fire alarm system installations in:
 - Hotel/motels
 - Assisted living
 - Dormitories
 - Apartments
- Not required in:
 - Hospitals*
 - Nursing homes
 - Prisons
 - Child Care Centers



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Notification Appliances-Audible

- Section 18.4.8-If ceiling heights allow, wall-mounted audible appliances shall be not less than 90 inches above the floor, but not less than 6 inches below the finished ceiling.



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Notification Appliances-Visible

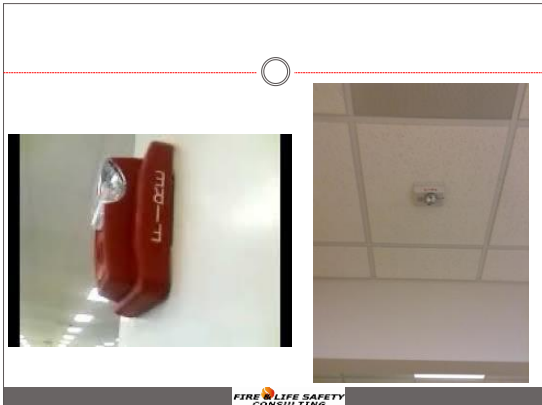
- Section 18.5.4-Wall mounted visible appliances shall be not less than 80 inches and not greater than 96 inches above the finished floor
- Performance-based design option for spacing and location
 - Must be designed by a licensed engineer
- Number and placement depends on the room size and light output of the strobe

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Visible Strobes

- Visible appliances are installed in one of two orientations:
 - Wall mounted
 - Ceiling mounted
- Strobes are listed for a certain orientation and cannot be used interchangeably.
 - Wall mounted strobes cannot be mounted on the ceiling or vice versa.

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Chapter 18 – Changes

- 18.4.10 Voice Intelligibility
- 18.4.10.1 Acoustically distinguishable spaces (ADS) are to be determined during design of a voice notification system.
- 18.4.10.2 ADS shall be identified by the system designer as needing or not needing voice intelligibility.



Audibility vs. Intelligibility

- Audibility – Can you hear the signal?
- Intelligibility – Can you understand the signal?



Voice Alarm Messages

- Voice messages shall not be required to meet the audibility requirements for public mode signaling, but shall meet intelligibility requirements.
 - Chapter 14 does not require voice signals to be measured for audibility.
 - Sound produced from a voice system is modulated and a meaningful measurement cannot be determined.

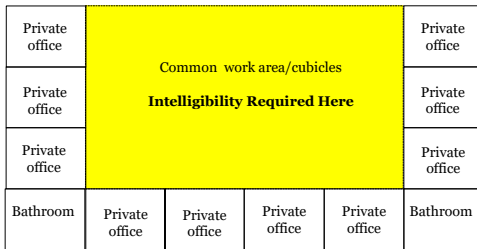
Voice Alarm Systems

- Areas that may not require voice intelligibility (18.4.10.2.1):
 - Private bathrooms;
 - Mechanical/elevator equipment rooms or similar areas;
 - Elevator cars
 - Kitchen/storage rooms/closets

Voice Alarm Systems-Office Building

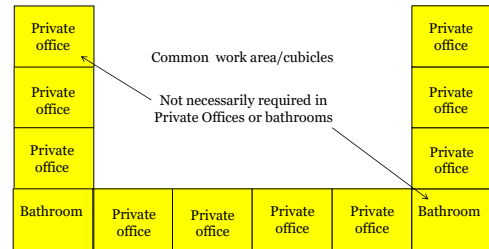
Private office	Common work area/cubicles				Private office
Private office	All areas (common area, private office, and bathrooms are considered an "acoustically distinguishable space" or ADS.				Private office
Private office					Private office
Bathroom	Private office	Private office	Private office	Private office	Bathroom

Voice Alarm Systems-Office Building



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Voice Alarm Systems-Office Building

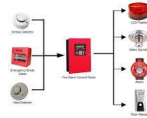


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Chapter 23

Protected Premises FA Systems

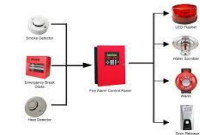
- Application
- General
- System Features
- System Performance & Integrity
- Performance for Initiating Device Circuits
- Performance for Signaling Line Circuits
- Performance for Notification Appliance Circuits
- System Requirements



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Chapter 23 (cont.)

- In-Building Fire Emergency Voice/Alarm Communications
- Prerecorded (Digital) Voice and Tone Fire Alarm Systems
- Two-Way Communication Service
- Signal Annunciation



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Chapter 23 (cont.)

- Suppression System Actuation
- Off-Premises Signals
- Guard's Tour Supervisory Service
- Suppressed Signal Systems
- Protected Premises Fire Safety Functions
- Special Requirements for Low-Power Radio (Wireless) Systems



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Protected Premises Fire Alarm Systems

- 23.2.3.1 Non-required protected premises systems and components shall meet the requirements of this Code.
- 23.3.1 Features for required systems shall be based on the requirements of applicable codes and statutes that have been adopted by the jurisdiction
 - MSFC tells you when and what type of FA is needed
- 23.3.2 Features of non-required systems shall be based on the goals and objectives of the system owner.

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Protected Premises Fire Alarm Systems

• Dedicated Function Fire Alarm Systems

- New term in the 2007 Edition
- “A *protected premises fire alarm system installed specifically to perform fire safety function(s) where a building fire alarm system is not required*”
- Intended to address “systems” where notification appliances and/or detectors are not required by model codes

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Protected Premises Fire Alarm Systems

• Dedicated Function Fire Alarm Systems

- Where codes, standards, or AHJs require monitoring of specific functions, but do not require a building fire alarm system, a dedicated function fire alarm system is appropriate.
 - Elevator recall
 - Sprinkler system
 - HVAC detectors
- Other functions of the fire alarm system are not required.

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Protected Premises Fire Alarm Systems

• Section 23.8.1.2-Systems may have a pre-signal feature when approved by the authority having jurisdiction.

- A pre-signal feature must meet the following criteria:
 - FA sounds only in offices, control rooms, fire brigade stations or other constantly attended location (no general evacuation throughout)
 - Transmission to supervising station (when required) shall commence upon activation from the initial fire alarm signal

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Protected Premises Fire Alarm Systems

• Pre-signal features (cont.):

- Requires human action to activate the general fire alarm (manual pull)
- Pre-signal should only be considered in limited cases when approved by the AHJ



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Protected Premises Fire Alarm Systems

• Section 23.8.1.3-Fire alarm systems may utilize positive alarm sequencing (PAS) when approved by the AHJ

• PAS must comply with the following:

- FA signal must be acknowledged within 15 seconds of when the signal is received
- If signal is not acknowledged within 15 seconds, notification signal and general evacuation shall commence.

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Protected Premises Fire Alarm Systems

• PAS must comply with the following (cont.):

- If signal is acknowledged, a delay of the evacuation signal of up to 180 seconds begins for staff to investigate the source of the alarm signal.
- If FA system is not reset after 180 seconds ends, notification appliances commence and general evacuation shall begin.

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Protected Premises Fire Alarm Systems

- PAS must comply with the following (cont.):
 - If a second automatic fire detector is actuated during the investigation (180 second) phase, notification appliances and general evacuation shall be activated.
 - If any other FA initiating device is actuated (manual pull), notification signals and evacuation shall be activated
 - The FA system shall provided a means for bypassing the PAS

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Protected Premises Fire Alarm Systems

- Pull Station-Section 23.8.5.1.2*-New Language
 - Where connected to a supervising station, FA systems employing automatic detection or water-flow monitoring shall include a manual alarm box to initiate a signal at the supervising station.
 - Not required for elevator recall control and supervisory control (duct detectors) dedicated function fire alarm systems.

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Protected Premises Fire Alarm Systems

- Annex Material-23.8.5.1.2
- Pull station is intended to provide a backup means of communication with supervising station when system is out of service.
- Because system is out of service, pull station should be placed on a separate circuit that will not be placed on test with the main FA system.
- Should be located around FACP or sprinkler riser.

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Protected Premises Fire Alarm Systems

- Section 23.8.5.4-Fire alarm systems equipped with alarm verification features shall be permitted.
 - *Alarm verification feature*-A feature of automatic smoke detection and alarm systems to reduce unwanted alarms where smoke detectors report alarm conditions for a minimum period of time, or confirm alarm conditions within a given period of time period after being reset in order to be accepted as a valid alarm signal.

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Protected Premises Fire Alarm Systems

- Alarm verification (cont.)
 - Only applicable to smoke detectors
 - The feature may be a part of individual smoke detectors or part of the fire alarm control panel.
 - See additional requirements in section 23.8.5.4.1



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Low-Power Fire Alarm Systems

- Low-power (wireless) fire alarm systems:
 - Special requirements found in section 23.18 (10) or 23.16 (13)
 - Numerous applications:
 - Historic buildings
 - Industrial (corrosives)
 - Remote/Non-continuous properties
 - FA alterations in existing buildings



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Chapter 24-Emergency Communication Systems



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Chapter 24

- Emergency Communication Systems (ECS)
 - Application
 - Purpose
 - General
 - One-Way Emergency Communication Systems
 - Two-Way In-Building Emergency Communication Systems



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Emergency Communication Systems

- Information, Command & Control
- Performance-Based Design of Mass Notification Systems



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Emergency Communication Systems

- 24.2.3 An emergency communication system is intended to communicate information about emergencies including:
 - fire,
 - human-caused events (accidental/intentional),
 - Accidents, or
 - Natural disasters.



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Emergency Communication Systems

- Chapter is new
- Chapter contains materials related to:
 - Emergency Voice Alarm Communication Systems
 - Emergency Communication Systems (also known as Mass Notification Systems)
- NOTE: MSFC tells you when an ECS is required

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Emergency Communication Systems

- Air Force Civil Engineering came to NFPA looking for guidance on mass notification systems (MNS)
 - Project was assigned to NFPA 72
 - Technical committee developed
- At the time there were no national standards/guidelines that addressed installation of these systems.



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Emergency Communication Systems

- Section 24.3.1-Emergency communication systems shall be capable of reproduction of prerecorded, synthesized, or live messages with voice intelligibility
 - Can require alternate or additional languages
 - It is recommended speakers be distributed around the building rather than high power output of a few speakers.

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Microphone Use

- Section 24.3.2.1*-All users of systems that are equipped with a microphone for live voice announcements shall be provided with posted instructions



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Emergency Communication Systems

- 24.3.4 Ancillary Functions
 - Emergency Communication Systems may be used for ancillary functions such as:
 - General paging
 - Background music
 - Non-emergency functions
 - Primary function (emergency notification) must take precedence and cannot be compromised



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Emergency Communication Systems

- 24.4 One Way Emergency Communication Systems
 - 24.4.1 In Building Fire Emergency Voice Alarm Communication Systems
 - 24.4.2 In-Building Mass Notification Systems
 - 24.4.3 Wide Area Mass Notification Systems
 - 24.4.4 Distributed Recipient Mass Notification Systems

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Emergency Communication Systems

- 24.4.1.2.1-Voice evacuation messages shall be preceded and followed by a minimum of two cycles of the emergency evacuation signal specified in section 18.4.2 (T3 pattern).
 - Goal is to get people's attention with the T3 pattern and then move into the voice instructions.



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Voice Alarm in Sleeping Areas

- In occupancies where sleeping accommodations are provided, a low-frequency tone shall be provided in the sleeping areas that complies with chapter 18.
- In areas where sleeping accommodations are provided, but message is communicated to those awake (public, common areas, etc.), low frequency is not required.



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Emergency Communication Systems

- 24.5 Two-way In Building Emergency Communication Systems
 - 24.5.1 Two-Way In Building Wired ECS
 - 24.5.2 Two Way Radio ECS
 - 24.5.3 Area of Refuge/Area of Rescue Assistance ECS
 - 24.5.4 Elevator ECS

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Chapter 26-Supervising Station FA Systems



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Chapter 26

- Supervising Station Fire Alarm Systems
 - Application
 - General
 - Alarm Systems for Central Station Service
 - Proprietary Supervising Station Systems
 - Remote Supervising Station Systems
 - Communication Methods for Supervising Station Alarm Systems

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Supervising Station Fire Alarm Systems

- Three options for monitoring a fire alarm system
 - MSFC will tell when monitoring is required
- Central Station
- Proprietary Supervising Station
- Remote Supervising Station
 - Remote Station represents roughly 85-90% of all monitored fire alarm systems (Source: AFAA)

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Fire Alarm Signal (Pre)Verification

- 2010 Edition-Allows monitoring companies to verify alarm signals for Remote Station Service only before dispatching when approved by the AHJ
- IAFC introduced proposal to NFPA 72 to require verification on all fire alarm signals.
 - IAFC proposal was modified
 - It was allowed only for remote station when approved by AHJ but verification cannot be more than 90 seconds.

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Fire Alarm Signal (Pre)Verification

- 2013 Edition-Alarm signal verification was expanded to allow for all three types of supervising stations (when approved by the AHJ).
- Language changed from “Alarm Signal Verification” to “Alarm Signal Preverification”



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Fire Alarm Signal (Pre)Verification

- 2016 Edition-All language dealing with preverification of alarm signals was removed from NFPA 72.

○ Rationale:

- Requirements are too confusing for code officials
- 911 call centers are not equipped to handle “possible calls”



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Confusing ?

- **Caution:** Do not confuse (smoke) alarm verification (chapter 23) with alarm signal pre-verification by the supervising station.
 - Smoke Alarm Verification involves smoke detectors and/or fire alarm control panels and their response to alarm signals
 - Alarm Signal Pre-Verification is referring to the supervising station’s role in responding to fire alarm signals from the protected premises.

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Supervising Station Alarm Systems

- 2013 Edition
- 26.2.4 Alarm Signal Content-When required by the AHJ, alarm signals transmitted to a supervising station shall be by addressable device or zone identification (“Point ID”)



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Supervising Station Alarm Systems

- Section 26.3.7.1.2-The central station shall perform the following actions upon receipt of an alarm signal:
 - Immediately retransmit the alarm to the communications center
 - Dispatch a runner/technician to the protected premises to arrive within 2 hours
 - Immediately notify the subscriber
 - Provide notice to the subscriber or AHJ, when required

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Supervising Station Alarm Systems

- Section 26.3.7.1.2-The central station shall perform the following actions upon receipt of an alarm signal:
 - Immediately retransmit the alarm to the communications center...
 - The term “immediately” in this context is intended to mean without unreasonable delay.
 - Routine handling should not take longer than 90 seconds to transmit to the supervising station.

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Chapter 26 – Changes

02/07 Communication Methods:

- | | |
|--------------------|----------------------|
| • Active Multiplex | • 1-Way Radio |
| • DACTs | • Direct Connect |
| • McCulloh | • Private Microwave |
| • 2-Way Radio | • Other Technologies |

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Chapter 26

10/13 Communication Methods

- ~~Active Multiplex~~
- DACTs
- ~~McCulloh~~
- 2-Way Radio
- 1-Way Radio
- ~~Direct Connect~~
- ~~Private Microwave~~
- Other Technologies

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Chapter 26 – Changes

• 26.6.3 Communication Methods

- 26.6.3.1 General
- 26.6.3.2 DACTs
- 26.6.3.3 Radio
 - 26.6.3.3.2 One-Way Radio
 - 26.6.3.3.1 Two-Way Radio



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Supervising Station FA Systems

- 2010 Edition
- Section 26.6.3.1.4.1-Where only one communications technology is used, any failure of the communication path shall be annunciated at the supervising station within 5 minutes of the failure.
- The transmission path shall be monitored



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Supervising Station FA Systems

- 2010 Edition
- Section 26.6.3.1.4.2-Where two or more transmission methods are used (DACTs), the following requirements shall be met:
 - Both transmission methods shall be monitored.
 - Failure of any of the communications path shall be annunciated at the supervising station and the protected premises at intervals of not more than every 24 hours.

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Supervising Station FA Systems

- 2013 Edition
- Section 26.6.3.1.5-Where a single transmission path is used, the following requirements shall be met:
 - The transmission method shall be monitored.
 - Failure of any of the communications path shall be annunciated at the supervising station and the protected premises at intervals of not more than every 60 minutes.

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Supervising Station FA Systems

- 2013 Edition (cont.)-For single transmission technology, failure of the communications path shall be annunciated at the supervising station and the protected premises at intervals of not more than every 60 minutes.
 - Why the change from 5 minutes to 60 minutes?
 - More FA are utilizing IP to monitor system and when IT departments shut down internet for service it was initiating trouble signals at panel.

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Supervising Station FA Systems

- **2013 Edition**
- Section 26.6.3.1.6-Where multiple transmission paths are used (DACTs), the following requirements shall be met:
 - Both transmission methods shall be monitored.
 - Failure of any of the communications path shall be annunciated at the supervising station and the protected premises at intervals of not more than every 6 hours.

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Chapter 26 – Changes

- 26.6.3.1.12 Secondary Power
 - Secondary power supplies for communication methods need to match the requirements for secondary power for the rest of the fire alarm system (24 hours).
 - Caution: Many power supplies for the communication method will not meet this requirement.

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Active vs. Passive Methods

- **Active = More Reliable**
 - The communications method indicates at the supervising station quickly when the communications pathway is interrupted
 - Ex: Cell, Radio, IP Communications
- **Passive = Less Reliable**
 - The communications method does not indicate when it is down; discovery is only when attempts are made to use it
 - Ex: DACTs



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Chapter 26 – DACTS

- **Definition: Digital Alarm Communicator Transmitter (DACT)**
 - A system component at the protected premises to which initiating devices or groups of devices are connected. The DACT seizes the connected telephone line, dials a preselected number to connect to a DACR, and transmits signals indicating status change of the initiating device (NFPA 72)

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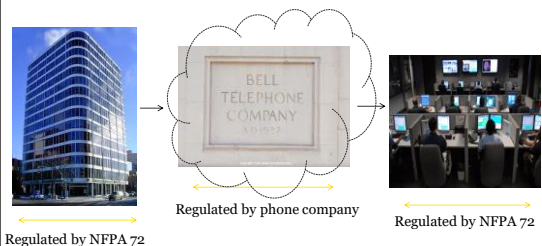
DACT Background & History

- First introduced in the 1980s.
- Determined (twice!) by TC to be unreliable.
- DACT proponents were successful on the third attempt to get into the standard, but with precautions for redundancy.
- Uses plain-old telephone service (POTS) phone lines

IF AT FIRST
YOU DON'T
SUCCEED,
TRY, TRY
AGAIN!

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DACT Background & History



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DACT Background & History

- DACTs are to be connected to the public switched telephone network ahead of any customer owned equipment
 - Must be ahead of any private-branch exchange (PBX) phone networks
- Connection needs to be on a loop start POTS telephone line.
- Ground start is not permitted.
 - Fire panel should not have to dial "9" to get an outside line.

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DACT Background & History

- DACTs need to do the following when sending a signal:
 - Seize the telephone line
 - Disconnect any other uses of the phone line
 - No public telephone lines
- NFPA 72 does NOT require a dedicated phone line.



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DACT Background & History

- DACTs need to:
 - Get a dial tone
 - Dial the DACR
 - Get verification that the DACR is ready to receive (handshake)
 - Transmit the signal
 - Receive acknowledgment that the DACR has accepted the signal (kiss-off).



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DACT Background & History

- Transmission channels for DACTs
 - First channel must be a loop start POTS (copper) telephone line.
 - Second channel could be either another telephone line, cellular telephone service, radio, or IP.



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DACT Background & History

- THE TRADITIONAL WAY (as originally proposed)
 - Use two end-to-end copper POTS telephone lines
 - Connect to the fire alarm system via a RJ-31X jack



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DACT Background & History

- Original concept of redundancy



- Original intent was to have phone lines on opposite ends

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Frequently Asked Question

- Can non-traditional phone service (fiber-optic or broadband) be used with a DACT?



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Frequently Asked Question

- Can non-traditional phone service (fiber-optic or broadband) be used with a DACT?
- ANSWER: Yes, as long as the service is provided through a managed facilities-based voice network (MFVN)



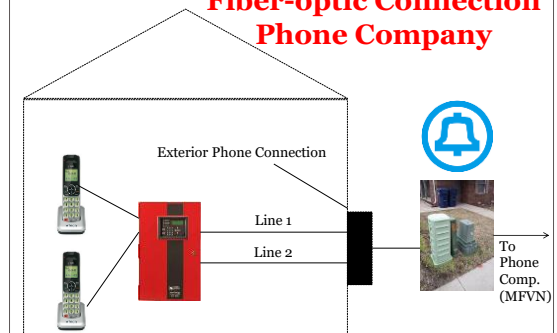
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Chapter 26 – DACTs

- Option 1
- Using telephone company fiber optic
 - Regular telephone company fiber optic lines
 - CODEC fiber optic lines is the same as end-to-end copper lines
 - All equipment is telephone company owned
 - **PROBLEM: Standby power supplies are generally only 8 hours, not 24 hours**

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Fiber-optic Connection Phone Company

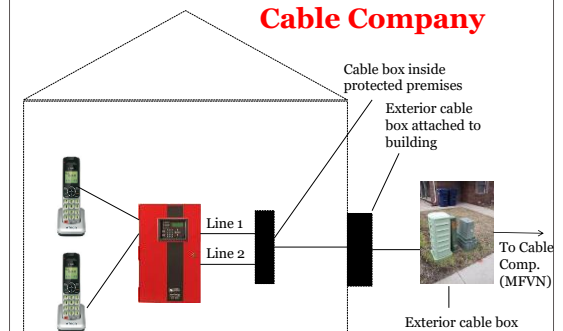


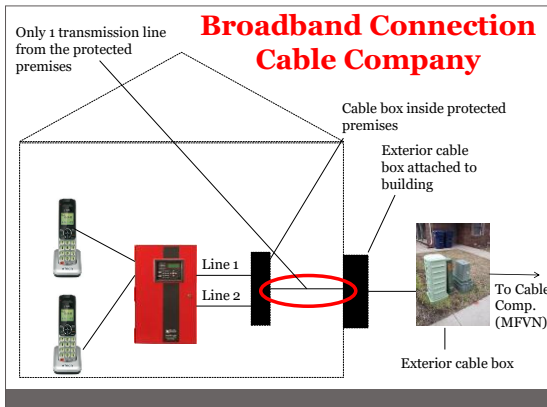
Chapter 26 – DACTs

- Option 2
- Cable company broadband
 - Cable company telephone service
 - CODEC is usually compatible with telephone company standards
 - **PROBLEM: Some equipment may be customer owned**
 - **PROBLEM: Standby power supplies are generally 8 hours, not 24 hours**

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Broadband Connection Cable Company





Chapter 26 – DACTs

- Using VoIP telephonic pathways
 - Service similar to “Vonage”, “Magic Jack”, or “Ooma”.
 - **PROBLEM: Lines are generally not compatible with telephone company equipment.**
 - **PROBLEM: Equipment is customer owned.**
 - **PROBLEM: Standby power is generally non-existent.**

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Chapter 26 – DACTs

- Using VoIP
 - Service similar to “Vonage”, “Magic Jack”, or “Ooma”.
 - **PROBLEM: Lines are generally not compatible with telephone company equipment.**
 - **PROBLEM: Equipment is customer owned.**
 - **PROBLEM: Standby power is generally non-existent.**

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The following table summarizes the requirements found in NFPA 72 2010.

Voice Provider Type	Telco			Cable	Internet
Product Examples	Verizon, AT&T, Landline, CenturyLink	Verizon, AT&T Landline	Verizon FiOS, AT&T UVerse	Comcast, TWC, Cox Cable Digital Voice	Vonage, MagicJack, Google Voice
Voice Equipment Location	Central Office	Remote Terminal	Customer Premises	Customer Premises	Customer Premises
Technology Used	Analog	Digital	VoIP	VoIP	VoIP
NFPA 72 AHJ Verification Requirements					
Managed Facilities-based	●	●	●	●	No
Functional equivalence to traditional PSTN line	●	●	●	●	No
Proactive management	●	●	●	●	No
Loop start telephone circuit	●	●	●	●	●
8 hour standby power for voice equipment providing dialtone	●	●	○	●	No
24 hours standby power at the “central office”	●	●	●	●	No
Safeguards to protect from unauthorized access	●	●	○	●	No
Notification to have alarm system re-tested	○	○	○	●	No
Professional installation ensuring line seizure	●	●	●	●	No
Disaster recovery plans	●	●	●	●	No

● indicates conformance to new NFPA requirements
○ indicates needs AHJ verification

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Chapter 26 – 2013 Edition

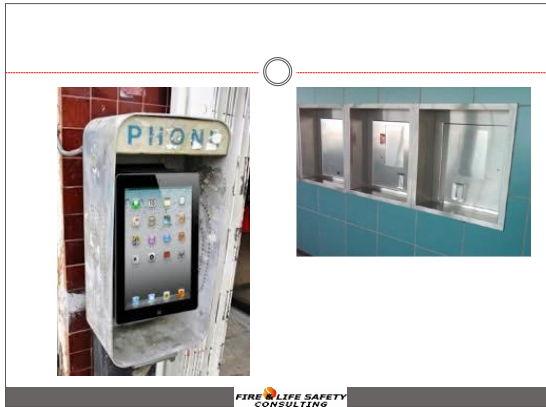
- The second line on a DACT must be a different technology (i.e. radio, IP)
- If there are two telephone lines on a DACT, time tests must be every 6 hours.

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Chapter 26 – DACTs

- *With each passing day, more and more communications services migrate to broadband and IP-based services, leaving the public switched telephone network and plain-old telephone service as relics of a by-gone era.*
- AT&T Filing to the FCC, 21 Dec. 2009

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Chapter 26 – Current Alternatives

- Current Alternatives to DACTS
- Radio
 - AES Intellinet
 - GSM
 - Alarm Net
- IP Communications
 - Firelite “IP-DACT”
 - Honeywell “IP-DACT”
- Cellular
 - Telular cellular communicator

Chapter 29

- Single & Multiple Station Alarms and Household Fire Alarm Systems
 - Application
 - Purpose
 - Basic Requirements
 - Assumptions
 - Detection and Notification
 - Power Supplies

Smoke Alarms & Household FA Systems

- Equipment Performance
- Installation
- Optional Functions
- Maintenance and Tests
- Markings and Instructions

Chapter 29 – Changes

- Section 29.3.8.1
 - Chapter 29 TC took a different approach than Chapter 18 TC on low frequency smoke alarms
 - Smoke alarms with low frequency are only required for those with mild to severe hearing loss.
 - Must have a square wave frequency

Correct smoke alarm location?

Is this in the “immediate vicinity” of the sleeping room?
(NFPA 72 (02) 11.5.1.1)

This was clarified in the 2010 Edition of NFPA 72:
 “Outside of each separate dwelling unit sleeping area,
 within 21 feet of any door to a sleeping room, with
 distance measured along path of travel” (29.5.1.1)



Household Smoke Alarms

• Section 29.8.1.4

- Continues language requiring smoke alarms in one & two family dwellings to be replaced after 10 years or when they fail to operability test.



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Chapter 29 & NFPA 720

- Proposal for the 2019 edition is to add NFPA 720 (CO detection and warning systems) into NFPA 72 (NFPA 720 would discontinue).
- Discussion also includes removing chapter 29 from NFPA 72 and creating a separate standard for single/multiple station smoke/CO alarms
 - Rational for change: single & multiple station smoke/CO alarms are not “fire alarm systems”
 - Proposal is to create a new NFPA standard for single & multiple station smoke alarms and carbon monoxide alarms (currently in NFPA 720).
 - Stay tuned...

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Chapter 29-2019 Edition ???

- Proposal has been made to remove Chapter 29 from NFPA 72 (2019 Edition)
 - Rational for change: single & multiple station smoke alarms are not “fire alarm systems”
 - Proposal is to create a new NFPA standard for single & multiple station smoke alarms and carbon monoxide alarms (currently in NFPA 720).
 - Stay tuned...

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NFPA 72 Task Group

- An NFPA 72 task group is working with the Fire Protection Research Foundation and Oklahoma State University
- Goal is to develop a new set of guidelines for code officials and designers when working on projects where the occupants have sensory related conditions.



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E-mail is preferred option so I can attach code sections, if necessary

Try to get back to you in 24 hours or less



THANK YOU!

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South Dakota Building Officials Association



Thank you for Coming!

SOUTH DAKOTA BUILDING OFFICIALS' ASSOCIATION

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