

# Fire Alarm Inspection, Testing, and Maintenance. What You Need to Know!

Presented by:

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39th Annual FPC Seminar + Expo

## Purpose

- Why inspect, test and maintain fire alarm?
  - Performance Verification
  - Reliability / Dependability
    - **Confirm Operational Integrity of System Panel**
    - **Confirm Circuit and Field Component Integrity**
    - **Confirm Building System Interface**
      - ✓ Confirm "other" systems are monitored / controlled / interfaced properly

**It is required by Code!**

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## Routine Inspection, Testing, and Maintenance Requirements

- Inspection, testing and maintenance is required by NFPA 72, *National Fire Alarm Code, Chapter 14 (2022 Edition)*.
- These requirements are intended to assure system operation and uncover potential problems so they can be corrected.



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## Inspection, Testing & Maintenance



- The requirements of NFPA 72, Chapter 14 apply to both new and existing systems.

The requirements are retroactive, including testing documentation!

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## Inspection, Testing & Maintenance



- Who is responsible for ensuring that inspections, tests, and maintenance are conducted?
- The owner is responsible for ensuring that fire alarm systems are properly maintained, inspected, and tested.
  - The owner may delegate (in writing) an individual or;
  - The owner may contract (in writing) the responsibility to another party.

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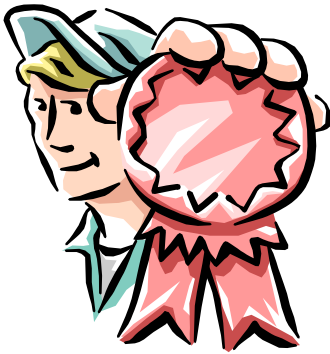
## Inspection, Testing & Maintenance

- Who is qualified to perform inspections, tests, and maintenance?
- Service personnel must be qualified and experienced in the inspection, testing, and maintenance of fire alarm systems.



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## Inspection, Testing & Maintenance



- **Trained Personnel**
  - Defined by NFPA 72 (10.5.3.4)
    - Factory trained and certified on the specific type and brand of system being serviced.
    - Certified by nationally recognized certification organization.
    - Registered, licensed, certified by the state or local authority.
    - Employed and qualified by an organization listed by a nationally recognized testing laboratory.

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## Contracting Your Fire Alarm System Testing



- **Selecting the right company**
  - Conduct Interviews
  - Ask for references – and call them
  - Review their documentation and forms
  - What experience do they have on your particular fire alarm system (not all are the same)?
  - What employees will be doing the test and what qualifications do THEY have?
- **Low dollar doesn't mean the right price – Remember, you are ultimately responsible.**
- **Know what you are getting and what the contractor is not doing!**

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## Fire Alarm Contractors

- Typical Fire Alarm Contractor Organization

- Manager
- Sales Person
- Project Manager
- Programmer / Technician
- Service Technician
- Designer
- **Inspector / Tester**
- Installer

Who are you getting?

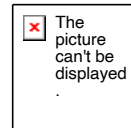


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## Introduction to Inspection & Testing

For Fire Alarm Systems the Owner must maintain:

- Manufacturers Documents (O&M manuals)
- Record Drawings
- Prior Inspection and Testing Records
- Site Specific Software



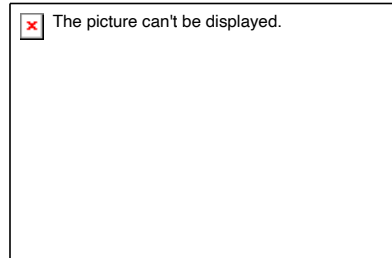
To be available to the contracted company performing the service – As well as for review by the local Fire Marshal.

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## Per NFPA-72

What does it mean when someone says  
“Testing and Maintenance per NFPA-72?”

- In accordance to ALL the requirements, frequency and methods prescribed in Chapter 14 “Inspection, Testing and Maintenance”



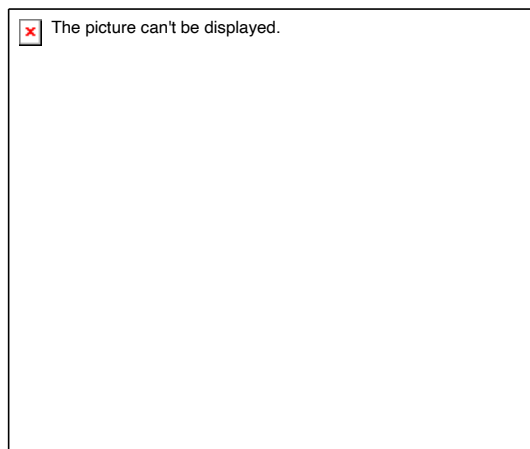
## Records

### 7.7.1.1

A complete record of the tests and operations of each system shall be kept until the next test and for 1 year thereafter unless more stringent requirements are required elsewhere in this Code.

### 7.7.2.1

With every new system, a documentation cabinet shall be installed at the system control unit or at another approved location at the protected premises.




# Inspection


- So what is required?
- 14.3 Inspection
  - Inspection = Visual Observations
  - Often done as part of the Testing
  - Frequency per Table 14.3.1
    - Components are listed individually

The contractor should develop a checklist for each specific building containing each initiating device, notification appliance and control relay.


For new installations, a written test plan is required.


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# Testing

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- 14.4 Annual Testing
  - Physical testing of each;
    - Initiating Device
    - Notification Appliance
    - Control Relay
    - Systems Interfaces
    - Control Panel
    - Etc, See table 14.4.3.2
  - Sequence of Operation
  - Interfaces with other systems (to the point of connection)

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# Testing

- Refer to Table 14.4.3.2 for Test Methods
  - Components are listed individually
    - **Initiating Devices and Circuits**
    - **Notification Appliances and Circuits**
    - **Interface Components and Auxiliary Circuits**
    - **Annunciators**
    - **DACT**

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# Testing

- **Timing & Logistics**
  - **Are All The Assets In Place?**
    - **Testing Schedule Posted**
    - **FA Technician Scheduled**
    - **Other**
  - **Documents**
    - **Record Of Completion**
    - **Previous Test Report**
    - **Record Drawings**

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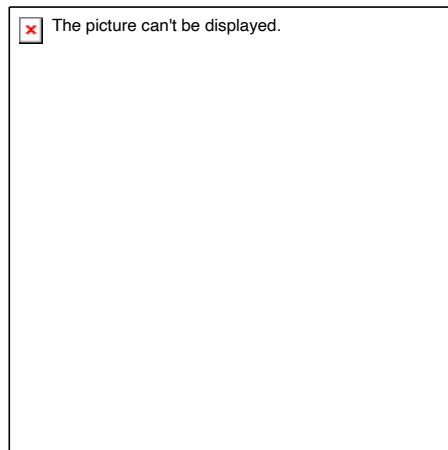
# Testing

- Pass / Fail?
  - Testing is NOT a Maybe Thing
    - **All Deficiencies To Be Corrected**
      - **Anticipate Possible Problems**
        - ✓ Spare Parts / Components
      - **Budget For Corrective Measures**
      - **Plan in Place for Outages**
        - ✓ Possible Fire Watch



# Testing Notification

- Before beginning any testing, notify:
  - Management
  - Occupants
  - Fire Department
  - Supervising Central Station

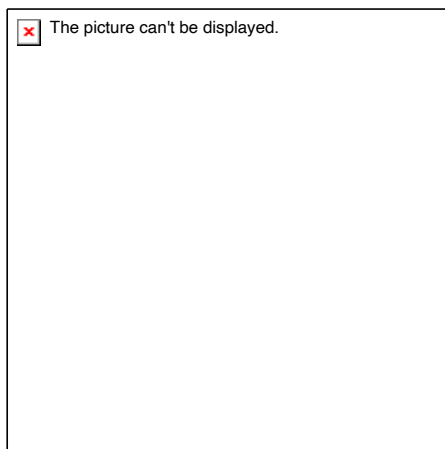


## Testing Notification

- Notify Occupants by:
  - Placing signs on all exit doors two days before testing (use red paper)
  - Place large signs in lobby and at entrances the day of testing
  - Sending e-mail
  - Bulletin boards

Note: See NFPA 72, 14.2.4, Notification and the Fire Alarm Test Report

## Testing Notification




- Restore systems promptly
  - Notify all parties of test conclusion

## What Gets Overlooked

- Smoke Detector Sensitivity
  - 1yr after Installation
  - Every alternate year thereafter
  - Up to five years a part (records of nuisance alarms must be maintained)


TYPICALLY EXCLUDED BY THE CONTRACTOR

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## What Gets Overlooked


- Smoke Detector Sensitivity Tests:
  - Calibrated test method (smoke box or other measurement device)
  - Manufacturer's calibrated test instrument (meter)
  - Listed controls where the detector causes a signal at the control unit (new addressable panels)

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## What Gets Overlooked


- **Load testing of the batteries**
  - Requires special equipment
- **Verification of Sequence of Operations**
  - Requires knowledge of the system programming features and a documented "Sequence of Operation" matrix (part of record drawings)
- **Verification of record drawings and device placement**
  - Only those devices or appliances that are visible get tested
- **Verification of evacuation / alert tone sound levels**
  - Requires use of a Sound Level (dBA) meter
- **Documentation and Verification of each notification appliance, individually.**
  - First appeared in the 2013 code edition – often overlooked

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## Life Safety Systems Testing


- **Some interfaced systems are tested as part of the fire alarm system**
  - HVAC
  - Elevators
  - Smoke Doors / Door Closures
  - Security
  - Releasing Circuits

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## Life Safety Systems Testing


- Suppression systems are NOT tested as part of fire alarm system test.
  - Test up to the releasing of system
  - Isolate the releasing system
  - Simulate release where possible
  - Suppression systems are tested to their own standards
    - **NFPA 25 for Water Based Systems**

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## Test Records

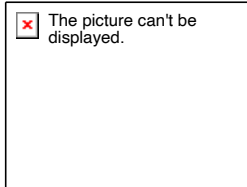
- After tests are satisfactorily finished, a completed Record of Inspection and Test (Fire Alarm Inspection and Test Report) should be prepared by the contractor.
- Retain this form in a safe place for one year, along with the previous year.

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## Other Test Records

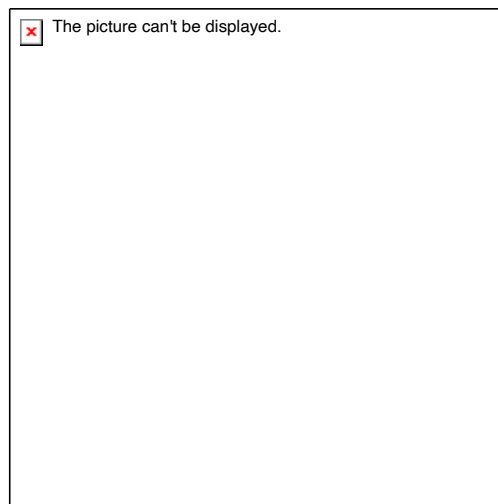
- Points list illustrating each device tested, location,
- Printed testing report from the system printer or downloaded from the system memory.
- Sensitivity report from the fire alarm control panel.



## Test Completed

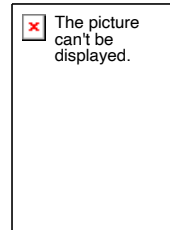
After any changes to the fire alarm system, the contractor shall revise the Record of Completion (Chapter 7 of NFPA 72)

Refer to Sample



## Test Completed

- Audit the contractors test records and documents to ensure compliance with NFPA-72
- Make sure you received:
  - Updated Record of Completion
  - NFPA Inspection and Testing Form
  - Detailed Test Report
  - System Reports
  - Sensitivity Report
  - Discrepancy Report
- The 2016 eForms from NFPA 72 is a good starting point. Section 7.8.2 lists forms to use.



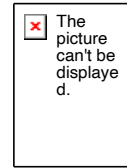
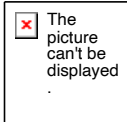
## Impairments

- System defects and malfunctions are to be corrected.
- If defect or malfunction cannot be corrected, the system owner (or owner's designated representative) shall be informed of the impairment in writing within 24 hours.



# Impairments

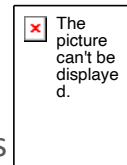
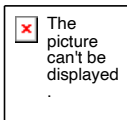
- The system owner (or designated representative) shall be notified when a fire alarm system or part thereof is impaired.
- A record shall be maintained by the system owner (or designated representative) for a period of one year from the date the impairment is corrected.



# Impairments

- Impairments include out-of-service events
  - Disabling systems or portions thereof during testing.

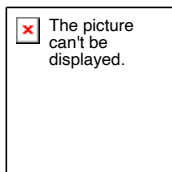
**When fire alarm system functions are disabled, someone should always be at the fire alarm control panel to restore these functions in the event of an actual alarm.**





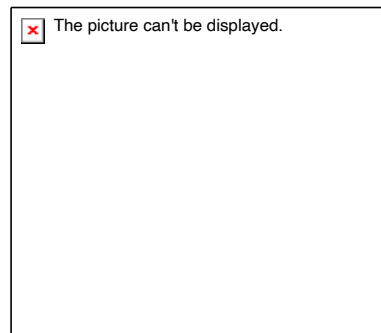
# Impairments

- Where required, mitigating measures acceptable to the AHJ shall be implemented for the period the system is impaired.
- The system owner (or designated representative) shall be notified when an impairment period is completed or discontinued.



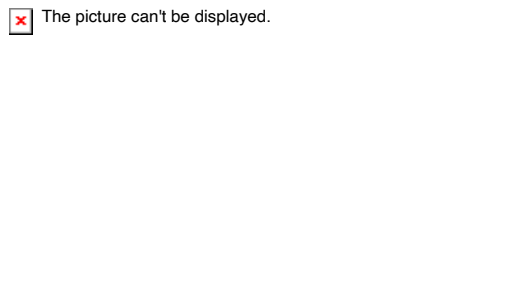
# New Technology for Performing Inspections and Testing

- Scanners and Barcode Readers
  - Eliminates missed devices
  - Ensures accuracy in reporting
  - Identifies devices removed or added since last inspection and test
  - Reduces inspection time



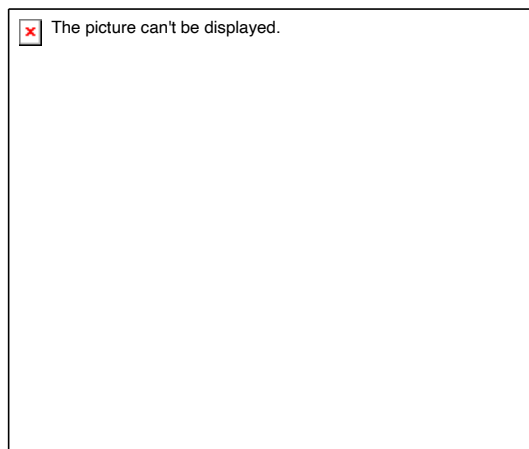
# New Technology for Performing Inspections and Testing

- Electronic Forms
  - Legible record documents
  - Accessible On-line
  - Code Compliant Documentation
  - CMS and Joint Commission Accepted



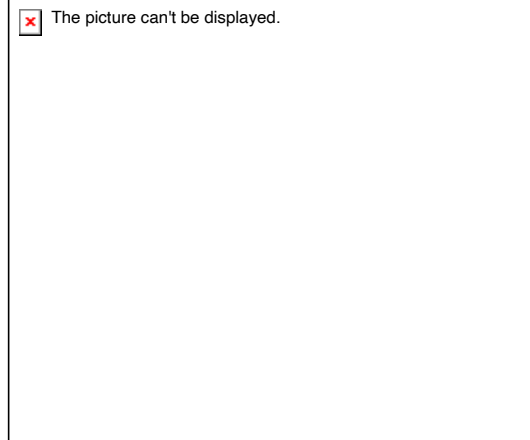
# Other Routine Inspection, Testing, and Maintenance

- **NFPA 10 - Fire Extinguishers**
- **NFPA 12A - Halon**
- **NFPA 13 - Automatic Sprinkler Sys**
- **NFPA 20 - Fire Pumps**
- **NFPA 25 - Water Based Systems**

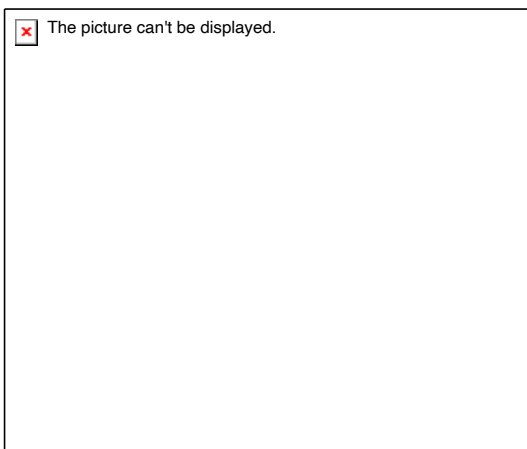


## Private Mode Fire Alarm Notification

- Chapter 18 / 19 of NFPA 101 allow Private Mode Occupant notification
- NFPA 72 has allowed it for more than 30 years
- NFPA 101 18/19.3.4.3.1 (2) Patient Care areas do NOT require alarm notification.



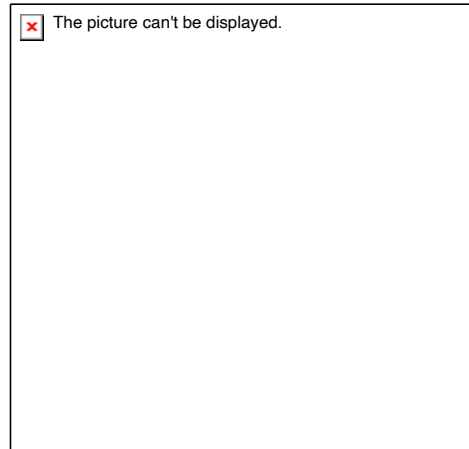
## Audible Allowance



- **18.4.5 Private Mode Audible Requirements.**
- **18.4.5.1 \*** ...Sound level at least 10 dB above the average ambient sound level or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 ft (1.5 m) above the floor.

## Visual Allowance

- **18.6 \* Visual Characteristics — Private Mode.**
- Visual notification appliances used in the private mode shall be of a sufficient quantity and intensity and located so as to meet the intent of the user and the authority having jurisdiction.
- **18.9 \* Textual and Graphical Visual Appliances.**
  - Allowable NFPA 72 18.9.2.1




## Private Mode Use



- Staff training is required
- RACE or PACE or your plan is part of the response
- Based on the building zoning and local AHJ alarm notification in all areas is not required (Selective Notification)

## Pros and Cons

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- Advantages include:
  - Less disruption of patient care, treatment, surgery, patient rest
  - Focused response to area of fire alarm origin.
  - Fewer AV appliances
- Disadvantages:
  - Non trained staff or visitors must be directed by trained staff.
  - Vendors, AHJs, Designers are unaware of the option.
  - Retro fit may be difficult for some Fire Alarm systems

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## Questions?


Contact:

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