Fire Alarm Inspection, Testing, Maintenance

Assuring the System’s Operational Reliability
What does AFAA-NE do?

- **Education**
  - We supply the tools our members require to perform within the guidelines of our code driven business

- **Influence Code and Standards**
  - Members sit on various boards and governing bodies that help influence and create codes and standards

- **Provide a Communication Network**
  - www.afaa-ne.org, FaceBook and Dinner Meetings

- **Promote Public Safety**
  - Raise awareness for Life Safety in the communities we serve
What we will cover

1. Why do we Inspect, Test and Maintain (ITM)
2. Who can perform ITM?
3. What, When, How?
4. Documentation, Documentation, Documentation
Why Do We Inspect?

- 14.2.1.1 The Purpose for initial and reacceptance inspections is to ensure compliance with approved design documents and to ensure installation in accordance with this code and other required installation standards.

- 14.2.1.2 The purpose of initial and reacceptance tests of fire alarm and signaling systems is to ensure system operation in accordance with the design documents.

- 14.2.1.3 The purpose for periodic inspections is to assure that obvious damages or changes that might affect the system operability are visually identified.

- 14.2.1.4 The purpose for periodic testing is to statistically assure operational reliability.
Who can perform ITM?

- **10.5.3.1 Inspection Personnel.** Inspections shall be performed by personnel who have developed competence through training and experience that are acceptable to the authority having jurisdiction or meet the requirement of 10.5.3.4

- **10.5.3.2 Testing Personnel.** Testing personnel shall have knowledge and experience of the testing requirements contained in this Code, of the equipment being tested, and of the test methods. That knowledge and experience shall be acceptable to the authority having jurisdiction or meet the requirements of 10.5.3.4

- **10.5.3.3 Service Personnel.** Service personnel shall have knowledge and experience of the maintenance requirements contained in this Code, of the equipment being serviced or maintained, and of the service and maintenance methods. That knowledge and experience shall be acceptable to the authority having jurisdiction or meet the requirements of 10.5.3.4
Who can perform ITM?

- 10.5.3.4 Means of Qualification. Qualified personnel shall include but not be limited to, one or more of the following:
  - (1) Personnel who are factory trained and certified for the specific type and brand of system being serviced.
  - (2) Personnel who are certified by a nationally recognized certification organization acceptable to the authority having jurisdiction.
  - (3) Personnel, either personally or through their affiliation with an organization that is registered, licensed, or certified by a state or local authority to perform service on systems addressed within the scope of this Code.
  - (4) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the servicing of systems within the scope of this Code.
What, When, How?

- Table 14.3.1 Visual Inspection
  - Component
  - Initial Acceptance
  - Periodic Frequency (D.M.A.S.)
  - Method
  - Reference

- Table 14.4.3.2 Testing
  - Component
  - Initial Acceptance
  - Periodic Frequency (D.M.A.S.)
  - Method
<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Acceptance</th>
<th>Periodic Frequency</th>
<th>Method</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>All equipment</td>
<td>X</td>
<td>Annual</td>
<td>Ensure there are no changes that affect equipment performance. Inspect for building modifications, occupancy changes, changes in environmental conditions, device location, physical obstructions, device orientation, physical damage, and degree of cleanliness.</td>
<td>14.3.4</td>
</tr>
</tbody>
</table>

2. Control equipment:
   (a) Fire alarm systems monitored for alarm, supervisory, and trouble signals
       (1) Fuses | X | Annual |
       (2) Interfaced equipment | X | Annual |
       (3) Lamps and LEDs | X | Annual |
       (4) Primary (main) power supply | X | Annual |
       (5) Trouble signals | X | Semiannual |
   (b) Fire alarm systems unmonitored for alarm, supervisory, and trouble signals
       (1) Fuses | X | Weekly |
       (2) Interfaced equipment | X | Weekly |
       (3) Lamps and LEDs | X | Weekly |
       (4) Primary (main) power supply | X | Weekly |
       (5) Trouble signals | X | Weekly |

Verify a system normal condition.
### Table 14.4.3.2 Testing

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Acceptance</th>
<th>Periodic Frequency</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All equipment</td>
<td>X</td>
<td></td>
<td>See Table 14.3.1.</td>
</tr>
<tr>
<td>2. Control equipment and transponder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Functions</td>
<td>X</td>
<td>Annually</td>
<td>Verify correct receipt of alarm, supervisory, and trouble signals (inputs); operation of evacuation signals and auxiliary functions (outputs); circuit supervision, including detection of open circuits and ground faults; and power supply supervision for detection of loss of ac power and disconnection of secondary batteries.</td>
</tr>
<tr>
<td>(b) Fuses</td>
<td>X</td>
<td>Annually</td>
<td>Verify rating and supervision.</td>
</tr>
<tr>
<td>(c) Interfaced equipment</td>
<td>X</td>
<td>Annually</td>
<td>Verify integrity of single or multiple circuits providing interface between two or more control units. Test interfaced equipment connections by operating or simulating operation of the equipment being supervised. Verify signals required to be transmitted at the control unit.</td>
</tr>
<tr>
<td>(d) Lamps and LEDs</td>
<td>X</td>
<td>Annually</td>
<td>Illuminate lamps and LEDs.</td>
</tr>
<tr>
<td>(e) Primary (main) power supply</td>
<td>X</td>
<td>Annually</td>
<td>Test under maximum load, including all alarm appliances requiring simultaneous operation. Test redundant power supplies separately.</td>
</tr>
<tr>
<td>3. Fire alarm control unit trouble signals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Audible and visual</td>
<td>X</td>
<td>Annually</td>
<td>Verify operation of control unit trouble signals. Verify ring-back feature for systems using a trouble-silencing switch that requires resetting.</td>
</tr>
<tr>
<td>(b) Disconnect switches</td>
<td>X</td>
<td>Annually</td>
<td>If control unit has disconnect or isolating switches, verify performance of intended function of each switch. Verify receipt of trouble signal when a supervised function is disconnected.</td>
</tr>
<tr>
<td>(c) Ground-fault monitoring circuit</td>
<td>X</td>
<td>Annually</td>
<td>If the system has a ground detection feature, verify the occurrence of ground-fault indication whenever any installation conductor is grounded.</td>
</tr>
<tr>
<td>(d) Transmission of signals to off-premises location</td>
<td>X</td>
<td>Annually</td>
<td>Actuate an initiating device and verify receipt of alarm signal at the off-premises location. Create a trouble condition and verify receipt of a trouble signal at the off-premises location. Actuate a supervisory device and verify receipt of a supervisory signal at the off-premises location. If a transmission carrier is capable of operation under a single- or multiple-fault condition, activate an initiating device during such fault condition and verify receipt of an alarm signal and a trouble signal at the off-premises location.</td>
</tr>
</tbody>
</table>
14.2.5 **System Documentation.** Prior to system maintenance or testing, the record of completion and any information required by Chapter 7 regarding the system alterations, including specifications, wiring diagrams, and floor plans, shall be provided by the owner or a designated representative to the service personnel upon request.

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

14.2.5.2 The revisions of fire alarm software, and the revisions of the software in the systems with which the fire alarm software interfaces, shall be verified for compatibility in accordance with 23.2.2.1.1
7.6 Inspection, Testing and Maintenance Documentation.

- 7.6.1 Test plan documentation shall be provided in accordance with 14.2.10
  - The purpose of a test plan is to document what was and was not actually tested (Annex)
- 7.6.2 Acceptance testing documentation shall be provided in accordance with 14.6.1
- 7.6.3 Reacceptance test documentation shall be provided in accordance with 14.6.1
- 7.6.4 Periodic inspection and testing documentation shall be provided in accordance with 14.6.2 thru 14.6.4
- 7.6.5 Impairment documentation shall be provided in accordance with Section 10.20
7.6 Inspection, Testing and Maintenance Documentation

7.6.6 Record of Inspection and Testing. The record of all inspections, testing, and maintenance as required by 14.6.2.4 shall be documented using either the record of inspection and testing forms, Figure 7.8.2(g) through Figure 7.8.2(l), or an alternative record...

10.20 Impairments

- Owner must be notified of impairment
- Owner must keep record of impairment for 1 year after it is corrected
- Supervising Station must notify AHJ of terminated monitoring
- Service provider must notify AHJ on any system down 8 hours
- Mitigating Measures determined by AHJ, from notice to fire watch
- Owner must be notified when impairment is corrected
Let’s talk

Questions?

Is a vacuum or compressed air the preferred method to clean detectors?

How do you test a Non-Restorable Heat Detector?

When don’t you need to perform a Sensitivity Test on smoke detectors?

Thank you!!!