



First Revision No. 5280-NFPA 72-2022 [Section No. 3.3.288]

3.3.291 Software.

Programs, instruments, procedures, data, and the like that are executed by a central processing unit of a product and that influences the functional performance of that product. For the purpose of this Code, software is one of ~~two~~ three types: executive software ~~and~~ , site-specific software, ~~and cybersecurity-related only software~~ . (SIG-TMS)

3.3.291.1 Executive Software.

Control and supervisory program that manages the execution of all other programs and directly or indirectly causes the required functions of the product to be performed. Executive software is sometimes referred to as firmware, BIOS, or executive program. (SIG-TMS)

3.3.291.2 Site-Specific Software.

Program that is separate from, but controlled by, the executive software that allows inputs, outputs, and system configuration to be selectively defined to meet the needs of a specific installation. ~~Typically it defines the type and quantity of hardware, customized labels, and the specific operating features of a system.~~ (SIG-TMS)

3.3.291.2.1 Informational Site-Specific Software.

Programs and information that are included as part of the site-specific software but whose inclusion, exclusion, or alteration does not affect the type and quantity of hardware on a system or the system's operational sequence as intended during emergency conditions. (SIG-TMS)

3.3.291.2.2 Operational Site-Specific Software.

Programs and information that affects the equipment and operation of a system as intended during emergency conditions. Typically, operational site-specific software defines the type and quantity of hardware and the specific operating controls or sequences of a system. (SIG-TMS)

3.3.291.3 Cybersecurity Software.

Software that is included in a system element and arranged such that its inclusion or exclusion in no way affects the executive or site-specific software execution and whose purpose is to reduce the vulnerability of the system and/or equipment to cybersecurity attacks. (SIG-TMS)

[Detail FR-5363](#)

3.3.291.4 Cybersecurity-Related Only Software.

Software that is included in a system element that is arranged such that its inclusion or exclusion in no way affects the executive or site-specific software execution and whose purpose is to reduce the vulnerability of the system to cybersecurity attacks. (SIG-FUN)

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: SIG-TMS

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Committee Statement

Committee Statement: The definition changes and additions support the increasing need for cybersecurity safety requirements, and the addition of cybersecurity software requirements to the code.

Response FR-5280-NFPA 72-2022

Message:

[Public Input No. 496-NFPA 72-2022 \[Sections 3.3.288.1, 3.3.288.2\]](#)

[Public Input No. 479-NFPA 72-2022 \[Section No. 3.3.288.2\]](#)

[Public Input No. 335-NFPA 72-2022 \[Section No. 3.3.288\]](#)



First Revision No. 5076-NFPA 72-2022 [Section No. 10.5.3.2]

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 requirement of 10.5.3.4 :~~

10.5.3.2.1

Testing personnel shall ~~have knowledge and experience of the~~ be knowledgeable of and experienced in the following:

- (1) Testing requirements contained in this Code
- (2) Equipment being tested
- (3) Test methods: to be used

10.5.3.2.2

~~That knowledge~~ Knowledge and experience shall be acceptable to the authority having jurisdiction or meet the requirement of 10.5.3.4.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Mon Jul 18 15:48:53 EDT 2022

Committee Statement

Committee Statement: The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response FR-5076-NFPA 72-2022

Message:

[Public Input No. 100-NFPA 72-2022 \[Section No. 10.5.3.2\]](#)

[Public Input No. 101-NFPA 72-2022 \[New Section after 10.5.3.2\]](#)

[Public Input No. 102-NFPA 72-2022 \[New Section after 10.5.3.2\]](#)



First Revision No. 5077-NFPA 72-2022 [Section No. 10.5.3.3]

10.5.3.3 Service Personnel.

~~Service personnel shall have knowledge and experience of the maintenance and servicing requirements contained in this Code, of the equipment being serviced or maintained, and of the servicing or maintenance methods. That knowledge and experience shall be acceptable to the authority having jurisdiction or meet the requirement of 10.5.3.4 :~~

10.5.3.3.1

Service personnel shall ~~have knowledge and experience~~ be knowledgeable of and experienced in the following:

- (1) Maintenance and servicing requirements contained in this Code
- (2) Equipment being serviced or maintained
- (3) Servicing or maintenance methods to be used

10.5.3.3.2

~~That knowledge~~ Knowledge and experience shall be acceptable to the authority having jurisdiction or meet the requirement of 10.5.3.4.

Submitter Information Verification

Committee: SIG-TMS

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Committee Statement

Committee The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section
Statement: 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response FR-5077-NFPA 72-2022

Message:

[Public Input No. 103-NFPA 72-2022 \[Section No. 10.5.3.3\]](#)

[Public Input No. 104-NFPA 72-2022 \[New Section after 10.5.3.3\]](#)

[Public Input No. 105-NFPA 72-2022 \[New Section after 10.5.3.3\]](#)



First Revision No. 5288-NFPA 72-2022 [Section No. 14.2.6.1]

14.2.6.1

Testing personnel shall be qualified and experienced in the specific arrangement and operation of a suppression system(s) and ~~a releasing function(s) and shall be related~~ releasing functions and cognizant of the hazards associated with inadvertent system discharge.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 11:25:43 EDT 2022

Committee Statement

Committee Statement: The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response Message: FR-5288-NFPA 72-2022

Public Input No. 56-NFPA 72-2022 [Section No. 14.2.6.1]



First Revision No. 5291-NFPA 72-2022 [Section No. 14.3.1]

14.3.1*

Unless otherwise permitted by 14.3.2, visual inspections shall be performed in accordance with the authority having jurisdiction or with the schedules provided in Table 14.3.1 or more often if required by the authority having jurisdiction, whichever is more frequent.

Table 14.3.1 Visual Inspection

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>	<u>Reference</u>
1. All equipment	X	Annual	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.	14.3.4; 14.3.5
2. Control equipment:				
(1) Fire alarm systems monitored for alarm, supervisory, and trouble signals			Verify a system normal condition.	
(a) Fuses	X	Annual		
(b) Interfaced equipment	X	Annual		
(c) Lamps and LEDs	X	Annual		
(d) Primary (main) power supply	X	Annual		
(e) Trouble signals	X	Semiannual		
(2) Fire alarm systems unmonitored for alarm, supervisory, and trouble signals			Verify a system normal condition.	
(a) Fuses	X	Weekly		
(b) Interfaced equipment	X	Weekly		
(c) Lamps and LEDs	X	Weekly		
(d) Primary (main) power supply	X	Weekly		
(e) Trouble signals	X	Weekly		
3. Reserved				
4. Supervising station alarm systems — transmitters			Verify location, physical condition, and a system normal condition.	

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>	<u>Reference</u>
(1) Digital alarm communicator transmitter (DACT)	X	Annual		
(2) Digital alarm radio transmitter (DART)	X	Annual		
(3) McCulloh transmitter	X	Annual		
(4) Radio alarm transmitter (RAT)	X	Annual		
(5) All other types of communicators	X	Annual		
In-building fire emergency				
5. voice/alarm communications equipment	X	Semiannual	Verify location and condition.	
6. Reserved				
7. Reserved				
8. Reserved				
9.* Batteries				10.6.10
(1) Valve-regulated lead-acid (VRLA) batteries				
(a) General	X	N/A	Ensure month and year of manufacture is marked in the month/year format on each battery cell/unit. Verify tightness of battery connections. Inspect terminals for corrosion, excessive container/cover distortion, cracks in cell/unit, or leakage of electrolyte. Replace any battery cell/unit if corrosion, distortion, or leakage is observed.	
(b) Marking	N/A	Semiannual	Verify marking of the month/year of manufacture on each battery cell/unit. Replace any cell/unit if alarm equipment manufacturer's replacement date has been exceeded.	

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>	<u>Reference</u>
(2) Primary (dry cell) <u>batteries</u> other than those used in low-power radio (wireless) systems in accordance with Chapter 23	X	Semiannual	Verify marking of the month/year of manufacture. <u>Ensure a minimum of 60 percent shelf life is remaining based on the use-by date printed on the battery. Record the installed date on the battery.</u> Replace if alarm equipment/battery manufacturer's replacement date has been exceeded. Replacement date not to exceed 12 months from the <u>installed date</u> . Verify tightness of connections. Inspect for corrosion or leakage. Replace any battery cell/unit if corrosion or leakage is observed.	
10. Reserved				
11. Remote annunciators	X	Semiannual	Verify location and condition.	
12. Notification appliance circuit (NAC) power extenders	X	Annual	Verify proper fuse ratings, if any. Verify that lamps and LEDs indicate normal operating status of the equipment.	10.6
13. Remote power supplies	X	Annual	Verify proper fuse ratings, if any. Verify that lamps and LEDs indicate normal operating status of the equipment.	10.6
14. Surge protective devices	X	Semiannual	Verify location and condition.	
15. Reserved				
16. Optical fiber cable connections	X	Annual	Verify location and condition.	
17. Initiating devices			Verify location and condition (all devices).	
(1) Air sampling				
(a) General	X	Semiannual	Verify that in-line filters, if any, are clean.	17.7.4.6
(b) Sampling system piping and sampling ports	X	N/A	Verify that sampling system piping and fittings are installed properly, appear airtight, and are permanently fixed. Confirm that sampling pipe is conspicuously identified. Verify that sample ports or points are not obstructed.	17.7.4.6
(2) Duct detectors				

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>	<u>Reference</u>
(a) General	X	Semiannual	Verify that detector is rigidly mounted. Confirm that no penetrations in a return air duct exist in the vicinity of the detector. Confirm the detector is installed so as to sample the airstream at the proper location in the duct.	17.7.6.5
(b) Sampling tube	X	Annual	Verify proper orientation. Confirm the sampling tube protrudes into the duct in accordance with system design.	17.7.6.5
(3) Electromechanical releasing devices	X	Semiannual		
(4) Fire extinguishing system(s) or suppression system(s) switches	X	Semiannual		
(5) Manual fire alarm boxes	X	Semiannual		
(6) Heat detectors	X	Semiannual		
(7) Radiant energy fire detectors	X	Quarterly	Verify no point requiring detection is obstructed or outside the detector's field of view.	17.8
(8) Video image smoke and fire detectors	X	Quarterly	Verify no point requiring detection is obstructed or outside the detector's field of view.	17.7.8; 17.8.5
(9) Smoke detectors (excluding one- and two-family dwellings)	X	Semiannual		
(10) Projected beam smoke detectors	X	Semiannual	Verify beam path is unobstructed.	
(11) Supervisory signal devices	X	Semiannual		
(12) Waterflow devices	X	Semiannual		
18. Reserved				
19. Combination systems			Verify location and condition (all types).	
(1) Fire extinguisher electronic monitoring devices/systems	X	Semiannual		

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>	<u>Reference</u>
(2) Carbon monoxide detectors/systems	X	Semiannual		
20. Alarm control interfaces and emergency control function interfaces	X	Semiannual	Verify location and condition.	
21. Guard's tour equipment	X	Semiannual	Verify location and condition.	
22. Notification appliances			Verify location and condition (all appliances).	
(1) Audible appliances	X	Semiannual		
(2) Loudspeakers	X	Semiannual		
(3) Visual appliances				
(a) General	X	Semiannual		18.5.5
(b) Candela rating	X	N/A	Verify the appliance candela rating marking or the <u>fire alarm control unit—controlled</u> (FACU-controlled), candela rating agrees with the approved drawings.	18.5.5
23. Exit marking audible notification appliances	X	Semiannual	Verify location and condition.	
24. Reserved				
25. Two-way emergency communications systems	X	Annual	Verify location and condition.	
26. Reserved				
27. Supervising station alarm systems — receivers				
(1) Signal receipt	X	Daily	Verify receipt of signal.	
(2) Receivers	X	Annual	Verify location and normal condition.	
28. Public emergency alarm reporting system transmission equipment			Verify location and condition.	
(1) Publicly accessible alarm box	X	Semiannual		
(2) Auxiliary box	X	Annual		
(3) Master box				

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>	<u>Reference</u>
(a) Manual operation	X	Semiannual		
(b) Auxiliary operation	X	Annual		
29. Reserved				
30. Mass notification system_(MNS)				
(1) Monitored for integrity			Verify a system normal condition.	
(a) Control equipment				
(i) Fuses	X	Annual		
(ii) Interfaces	X	Annual		
(iii) Lamps/ and LEDs	X	Annual		
(iv) Primary (main) power supply	X	Annual		
(b) Secondary power batteries	X	Annual		
(c) Initiating devices	X	Annual		
(d) Notification appliances	X	Annual		
(2) Not monitored for integrity; installed prior to adoption of the 2010 edition			Verify a system normal condition.	
(a) Control equipment				
(i) Fuses	X	Semiannual		
(ii) Interfaces	X	Semiannual		
(iii) Lamps/ and LEDs	X	Semiannual		
(iv) Primary (main) power supply	X	Semiannual		
(b) Secondary power batteries	X	Semiannual		
(c) Initiating devices	X	Semiannual		
(d) Notification appliances	X	Semiannual		
(3) Antenna	X	Annual	Verify location and condition.	
(4) Transceivers	X	Annual	Verify location and condition.	

~~Note:~~ N/A = ~~not~~ : Not applicable, no minimum requirement established.

* For other than VRLA or primary (dry) cell batteries, refer to the battery manufacturer's published instructions or IEEE 450, *Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications*, for vented lead-acid batteries, and IEEE 1106, *Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications*, for nickel-cadmium batteries.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 11:48:29 EDT 2022

Committee Statement

Committee Statement: Primary batteries sold in the United States provide a shelf life expiration date rather than the date of manufacture. The shelf life expiration date is commonly referred to as a "use before" or "best if used by" date, etc., and is the date that the manufacturer cannot guarantee that full life is left. Shelf life varies based on chemistry. Many publications indicate that dry cell shelf life could be as little as 50 percent of its rating regardless of chemistry when stored at room temperature.

When the battery is installed, it should be verified to be fresh as possible to increase the likelihood it will last a full 12 months. Establishing a minimum shelf life of 60 percent adds assurance that the installed battery will not be installed at the end of its shelf life and will likely last 12 months. For example, an alkaline battery with a ten year shelf life has a "Use Before" date of JUL 28. Fifty percent of shelf life occurs JUL 23. The battery should not be installed after JUL 22. The installed date should be recorded so that it can be determined how long the battery has been installed.

Response Message: FR-5291-NFPA 72-2022

Public Input No. 187-NFPA 72-2022 [Section No. 14.3.1]



First Revision No. 5292-NFPA 72-2022 [Section No. 14.4.2.2]

14.4.2.2

When an initiating device, notification appliance, or control relay is deleted, another device, appliance, or control relay on the circuit shall be ~~operated~~ functionally tested .

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 11:52:44 EDT 2022

Committee Statement

Committee Statement: "Operated" was changed to "Functionally tested" for clarity and consistency with 14.4.2.1.

Response Message: FR-5292-NFPA 72-2022

[Public Input No. 510-NFPA 72-2022 \[Section No. 14.4.2.2\]](#)

[Public Input No. 393-NFPA 72-2022 \[Section No. 14.4.2.2\]](#)

[Public Input No. 471-NFPA 72-2022 \[Section No. 14.4.2.2\]](#)



First Revision No. 5357-NFPA 72-2022 [Section No. 14.4.2.3]

14.4.2.3*

When ~~modifications or repairs to~~ control unit hardware ~~are made~~ is modified or repaired, the control unit shall be tested in accordance with ~~Table 14.4.3.2~~ – items 2(1) and 2(4) of Table 14.4.3.2.

A.14.4.2.3

Control unit hardware could include, but is not limited to, the central processing unit, power supply, integrated off-premises transmitter, and signaling line circuit.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Fri Jul 22 10:09:33 EDT 2022

Committee Statement

Committee Statement: This clarifies what is meant by "control unit hardware" since it is not a defined term.

Response Message: FR-5357-NFPA 72-2022

[Public Input No. 524-NFPA 72-2022 \[New Section after A.14.4.2\]](#)

[Public Input No. 406-NFPA 72-2022 \[New Section after A.14.4.2\]](#)

[Public Input No. 478-NFPA 72-2022 \[New Section after A.14.4.2\]](#)

**First Revision No. 5302-NFPA 72-2022 [Section No. 14.4.2.4]****14.4.2.4**

When ~~changes are made to~~ site-specific software is changed , the following shall apply:

- (1) All functions known to be affected by the change, or identified by a means that indicates changes, shall be 100 percent tested.
- (2) ~~In addition, 10~~ Ten percent of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, ~~also~~ shall be tested ~~and correct system operation shall be verified~~ to verify correct system operation .
- (3) A revised record of completion in accordance with 7.5.6 shall be prepared to reflect ~~these changes~~ the change .

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 13:04:42 EDT 2022

Committee Statement

Committee Statement: The language for subsection (2) was simplified in keeping with the Manual of Style.

Response Message: FR-5302-NFPA 72-2022

[Public Input No. 57-NFPA 72-2022 \[Section No. 14.4.2.4\]](#)



First Revision No. 5349-NFPA 72-2022 [Section No. 14.4.3.2]

14.4.3.2*

Systems and associated equipment shall be tested according to Table 14.4.3.2.

Table 14.4.3.2 Testing

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
1.	All equipment	X		See Table 14.3.1.
2.	Control unit			
	(1) Functions	X	Annually	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.
	(2) Fuses	X	Annually	Verify rating and supervision.
	(3) Interfaced equipment	X	Annually	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.
	(4) Lamps and LEDs	X	Annually	Illuminate lamps and LEDs.
	(5) Primary (main) power supply	X	Annually	Disconnect all secondary (standby) power and test under maximum load, including all alarm appliances requiring simultaneous operation. Reconnect all secondary (standby) power at end of test. Test redundant power supplies separately.
3.	Alarm control unit trouble signals			
	(1) Audible and visual	X	Annually	Verify operation of control unit trouble signals. Verify ring-back feature for systems using a trouble-silencing switch that requires resetting.
	(2) Disconnect switches	X	Annually	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.
	(3) Ground-fault monitoring circuit	X	Annually	If the system has a ground detection feature, verify the occurrence of ground-fault indication whenever any installation conductor is grounded.
	(4) Transmission of signals to off-premises location	X	Annually	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.

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
				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, actuate an initiating device during such fault condition and verify receipt of an alarm signal and a trouble signal at the off-premises location.
	Supervising station alarm 4. systems — transmission equipment			
	(1) All equipment	X	Annually	Ⓐ Test all system functions and features in accordance with the equipment manufacturer's published instructions for correct operation in conformance with the applicable sections of Chapter 26.^a Except for DACT, actuate initiating device and verify receipt of the correct initiating device signal at the supervising station within 90 seconds. Upon completion of the test, restore the system to its functional operating condition. If test jacks are used, conduct the first and last tests without the use of the test jack.
	(2) Digital alarm communicator transmitter (DACT)	X	Annually	Except for DACTs installed prior to adoption of the 2013 edition of <i>NFPA 72</i> that are connected to a telephone line (number) that is also supervised for adverse conditions by a derived local channel, ensure connection of the DACT to two separate means of transmission. Test DACT for line seizure capability by initiating a signal while using the telephone line (primary line for DACTs using two telephone lines) for a telephone call. Ensure that the call is interrupted and that the communicator connects to the digital alarm receiver. Verify receipt of the correct signal at the supervising station. Verify each transmission attempt is completed within 90 seconds from going off-hook to on-hook.

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
-			Disconnect the telephone line (primary line for DACTs using two telephone lines) from the DACT. Verify indication of the DACT trouble signal occurs at the premises fire alarm control unit (<u>FACU</u>) within 4 minutes of detection of the fault. Verify receipt of the telephone line trouble signal at the supervising station. Restore the telephone line (primary line for DACTs using two telephone lines), reset the fire alarm control unit <u>FACU</u>, and verify that the telephone line fault trouble signal returns to normal. Verify that the supervising station receives the restoral signal from the DACT. Disconnect the secondary means of transmission from the DACT. Verify indication of the DACT trouble signal occurs at the premises fire alarm control unit <u>FACU</u> within 4 minutes of detection of the fault. Verify receipt of the secondary means trouble signal at the supervising station. Restore the secondary means of transmission, reset the fire alarm control unit <u>FACU</u>, and verify that the trouble signal returns to normal. Verify that the supervising station receives the restoral signal from the secondary transmitter. Cause the DACT to transmit a signal to the DACR while a fault in the telephone line (number) (primary line for DACTs using two telephone lines) is simulated. Verify utilization of the secondary communications path by the DACT to complete the transmission to the DACR.
(3) Digital alarm radio transmitter (DART)	X	Annually	Disconnect the primary telephone line. Verify transmission of a trouble signal to the supervising station by the DART occurs within 4 minutes.
(4) McCulloh transmitter	X	Annually	Actuate initiating device. Verify production of not less than three complete rounds of not less than three signal impulses each by the McCulloh transmitter. If end-to-end metallic continuity is present and with a balanced circuit, cause each of the following four transmission channel fault conditions in turn; and verify receipt of correct signals at the supervising station: (1) Open (2) Ground (3) Wire-to-wire short (4) Open and ground

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
			If end-to-end metallic continuity is not present and with a properly balanced circuit, cause each of the following three transmission channel fault conditions in turn; and verify receipt of correct signals at the supervising station: (1) Open (2) Ground (3) Wire-to-wire short Cause a fault between elements of the transmitting equipment. Verify indication of the fault at the protected premises, or transmission of trouble signal to the supervising station.
(5) Radio alarm transmitter (RAT)	X	Annually	
(6) Performance-based technologies	X	Annually	Perform tests to ensure the monitoring of integrity of the transmission technology and technology path. Where shared communications equipment is used as permitted by 26.6.3.12, <u>provided test</u> secondary (standby) power sources shall be tested in accordance with Table 14.4.3.2, item 7, 8, or 9, as applicable. Where a single communications path is used, disconnect the communication path. Manually initiate an alarm signal transmission or allow the check-in (handshake) signal to be transmitted automatically. ^b Verify the premises unit annunciates the failure within 200 seconds of the transmission failure.^b Restore the communication path. Where multiple communication paths are used, disconnect both all communication paths. Manually initiate an alarm signal transmission. Verify the premises control unit annunciates the failure within 200 seconds of the transmission failure. Restore both all communication paths.
Emergency communications equipment			
(1) Amplifier/tone generators	X	Annually	Verify correct switching and operation of backup equipment.
(2) Call-in signal silence	X	Annually	Operate/function and verify receipt of correct visual and audible signals at control unit.
(3) Off-hook indicator (ring down)	X	Annually	Install phone set or remove phone from hook and verify receipt of signal at control unit.
(4) Phone jacks	X	Annually	Visually inspect phone jack and initiate communications path through jack.
(5) Phone set	X	Annually	Actuate each phone set and verify correct operation.

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
	(6) System performance	X	Annually	Operate the system with a minimum of any five handsets simultaneously. Verify voice quality and clarity.
6.	Engine-driven generator	X	Monthly	If an engine-driven generator dedicated to the system is used as a required power source, verify operation of the generator and transfer switch in accordance with NFPA 110 by the building owner.
7.	Emergency power supply system/stored-emergency power supply system (EPSS/SEPSS)	X	Annually	If an EPSS/SEPSS dedicated to the system is used as a required power source, verify by the building owner operation of the EPSS/SEPSS in accordance with NFPA 111.
8.	Secondary (standby) power supply ^c	X	Annually	Disconnect all primary (main) power supplies and verify the occurrence of required trouble indication for loss of primary power. Measure or verify the system's standby and alarm current demand using the equipment manufacturer's data and verify the battery's rated capacity exceeds the system's power demand, including the safety margin. Operate general alarm systems for a minimum of 5 minutes and emergency voice communications systems for a minimum of 15 minutes. Reconnect primary (main) power supply at end of test.
9.	VRLA battery and charger ^d			Prior to conducting any battery testing, verify by the person conducting the test; that all system software stored in volatile memory is protected from loss.
	(1) Temperature test	X	Semiannually	Upon initially opening the cabinet door, measure the internal ambient temperature of the enclosure. Measure the temperature of each battery cell/unit at the negative terminal with an infrared thermometer. Replace any battery cell/unit if its temperature is greater than 18°F (10°C) above the measured internal ambient temperature of the enclosure.
	(2) Charger test ^e	X	Semiannually	With the battery fully charged and connected to the charger, measure the voltage across the battery with a voltmeter. Verify the voltage is within the battery/alarm equipment manufacturer's recommendations. If the voltage is outside of the specified limits, either adjust the charger to within limits or replace the charger. <u>If the charger is adjustable, adjust the output voltage to 2.265 volts, ±0.015 volts, per cell at 77°F (25°C) or as specified by the alarm equipment manufacturer.</u>

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
	(3) Cell/Unit voltage test	X	Semiannually	With the battery fully charged and connected to the charger, measure the voltage of each cell/unit with a voltmeter. Replace the battery when any cell/unit measures a voltage less than 13.26 volts.
	(4) Ohmic test ^{f e}	X	N/A	When the battery is installed, establish a baseline ohmic value for each battery cell/unit or, where available, use baseline ohmic values provided by the battery or test equipment manufacturer. In either case, record the base line ohmic value on each battery cell/unit.
			Semiannually	With the battery fully charged, measure the internal ohmic value of each battery cell/unit. Record the test date and ohmic value on each cell/unit. Replace the battery when the ohmic measurement of any cell/unit deviates from the established baseline by 30% <u>percent</u> or more for conductance, or 40% <u>percent</u> or more for resistance or impedance. Where the battery or test equipment manufacturer's baseline ohmic values are used, replace the battery when any cell/unit has an internal ohmic value outside of the acceptable range. <u>A load test in accordance with item 9(5) is permitted in lieu of an ohmic test.</u>
	(5) Replacement/Load test ^{g f}		<u>Every 3 years</u>	Replace the battery or conduct a load test of the battery capacity. Load test the battery, based on the manufacturer's specifications for a discharge rate of 3 hours or more, by applying the current indicated for the selected hourly discharge rate continuously; until the terminal voltage decreases to the end voltage specified by the manufacturer. Record the test duration and calculate the battery capacity including adjustment for ambient temperature. Replace the battery if capacity is less than or equal to 80% <u>percent</u> or at the next scheduled test interval if battery capacity is less than 85% <u>percent</u> .
10.	Public emergency alarm reporting system — wired system	X	Daily	Manual tests of <u>Manually test</u> the power supply for public reporting circuits shall be made and recorded <u>document the tests</u> at least once during each 24-hour period. Such tests shall include <u>Test</u> the following: (1) Current strength of each circuit. Changes <u>Immediately investigate changes</u> in current of any circuit exceeding 10 percent shall be investigated immediately .

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
				(2) Voltage across terminals of each circuit inside of terminals of protective devices. Changes <u>Immediately investigate changes</u> in voltage of any circuit exceeding 10 percent shall be investigated immediately . (3)^h Voltage between ground and circuits. If <u>Immediately locate and clear the trouble if</u> this test shows a reading in excess of 50 percent of that shown in the test specified in (2), the trouble shall be immediately located and cleared . <u>Readings Give early attention to readings</u> in excess of 25 percent shall be given early attention . <u>These Measure all</u> readings shall be taken with a calibrated voltmeter of not more than 100 ohms resistance per volt. Systems in which each circuit is supplied by an independent current source (Forms 3 and 4) require tests between ground and each side of each circuit. Common current source systems (Form 2) require voltage tests between ground and each terminal of each battery and other current source.⁹ (4) Ground current reading shall be <u>readings are</u> permitted in lieu of (3). If this method of testing is used, <u>give immediate attention to</u> all grounds showing a current reading in excess of 5 percent of the supplied line current shall be given immediate attention . (5) Voltage across terminals of common battery on switchboard side of fuses. (6) Voltage between common battery terminals and ground. Abnormal <u>Immediately investigate abnormal</u> ground readings shall be investigated immediately . Tests specified in (5) and (6) shall apply only to those systems using a common battery. If more than one common battery is used, <u>test</u> each common battery shall be tested .
11.	Remote annunciators	X	Annually	Verify the correct operation and identification of annunciators. If provided, verify the correct operation of <u>annunciators</u> under a fault condition.
12.	Reserved			
13.	Reserved			
14.	Wireless communications	X	Annually	Test per <u>in accordance with</u> the manufacturer's published instructions.
15.	Conductors — metallic			

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
	(1) Stray voltage	X	N/A	Test all installation conductors with a volt/ohmmeter to verify that there are no stray (unwanted) voltages between installation conductors or between installation conductors and ground. Verify the maximum allowable stray voltage does not exceed 1 volt ac/dc, unless a different threshold is specified in the manufacturer's published instructions for the installed equipment.
	(2) Ground faults	X	N/A	Test all installation conductors, other than those intentionally and permanently grounded, for isolation from ground <u>per in accordance with</u> the installed equipment manufacturer's published instructions.
	(3) Short-circuit faults	X	N/A	Test all installation conductors, other than those intentionally connected together, for conductor-to-conductor isolation <u>per in accordance with</u> the manufacturer's published instructions for the installed equipment. Also test these same circuits conductor-to-ground.
	(4) Loop resistance	X	N/A	With each initiating and indicating circuit installation conductor pair short-circuited at the far end, measure and record the resistance of each circuit. Verify that the loop resistance does not exceed the limits specified in the manufacturer's published instructions for the installed equipment.
	(5) Circuit integrity	X	N/A	For initial and reacceptance testing, confirm the introduction of a fault in any circuit monitored for integrity results in a trouble indication at the fire alarm control unit <u>FACU</u> . Open one connection at not less than 10 percent of the initiating devices, notification appliances, and controlled devices on every initiating device circuit, notification appliance circuit, and signaling line circuit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
		N/A	Annually	For periodic testing, test each initiating device circuit, notification appliance circuit, and signaling line circuit for correct indication at the control unit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
16.	Nonmetallic pathways			

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(1) Optical fiber cables	X	N/A	Test the transmission characteristics of optical fibers by the use of <u>with</u> an optical power meter or by <u>with</u> an optical time domain reflectometer used to measure the relative power loss of the line. Test result data must meet or exceed ANSI/TIA 568.3, <i>Optical Fiber Cabling and Components Standard</i> , related to fiber-optic lines and connection/splice losses and the control unit manufacturer's published specifications.
(2) Circuit integrity	X	N/A	For initial and reacceptance testing, confirm the introduction of a fault in any circuit monitored for integrity results in a trouble indication at the fire alarm control unit <u>FACU</u> . Open one connection at not less than 10 percent of the initiating devices, notification appliances, and controlled devices on every initiating device circuit, notification appliance circuit, and signaling line circuit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
	N/A	Annually	For periodic testing, test each initiating device circuit, notification appliance circuit, and signaling line circuit for correct indication at the control unit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
17. Initiating devices i <u>h</u>			
(1) Electromechanical releasing device			
(a) Nonrestorable-type link	X	Annually	Verify correct operation by removal of the fusible link and operation of the associated device.
(b) Restorable-type link i <u>i</u>	X	Annually	Verify correct operation by removal of the fusible link and operation of the associated device.
(2) Fire extinguishing system(s) or suppression system(s) alarm switch	X	Annually	Operate the switch mechanically or electrically and verify receipt of signal by the fire alarm control unit <u>FACU</u> .
(3) Fire-gas and other detectors	X	Annually	Test fire-gas detectors and other fire detectors as prescribed by the manufacturer and as necessary for the application.
(4) Heat detectors			

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(a) Fixed-temperature, rate-of-rise, rate of compensation, restorable line, spot type (excluding pneumatic tube type)	X	Annually (see 14.4.4.5)	Perform heat test with a listed and labeled heat source or in accordance with the manufacturer's published instructions. Assure that the test method for the installed equipment does not damage the nonrestorable fixed-temperature element of a combination rate-of-rise/fixed-temperature element detector.
(b) Fixed-temperature, nonrestorable line type	X	Annually	Do not perform heat test. Test functionality mechanically and electrically. Measure and record loop resistance. Investigate changes from acceptance test.
(c) Fixed-temperature, nonrestorable spot type	X	See Method <u>column</u>	After 15 years from initial installation, replace all devices or have 2 per every <u>100</u> detectors per 100 laboratory tested. Replace the 2 detectors with new devices. If a failure occurs on any of the detectors removed, remove and test additional detectors to determine either a general problem involving faulty detectors or a localized problem involving 1 or 2 defective detectors. If detectors are tested instead of replaced, repeat tests at intervals of 5 years. Do not perform heat tests. Test functionality <u>If verifying electrical continuity or supervision, test mechanically and or electrically in accordance with the manufacturer's instructions .</u>
(d) Restorable line type, pneumatic tube only	X	Annually	Perform heat tests (where test chambers are in circuit); with a listed and labeled heat source or in accordance with the manufacturer's published instructions of the detector, or conduct a test with pressure pump.
(e) Single- and multiple-station heat alarms	X	Annually	Conduct functional tests according to <u>the</u> manufacturer's published instructions. Do not test nonrestorable heat detectors with heat.
(5) Manual fire alarm boxes	X	Annually	Operate manual fire alarm boxes per in <u>accordance with</u> the manufacturer's published instructions. Test both key-operated presignal and general alarm manual fire alarm boxes.
(6) Radiant energy fire detectors	X	Semiannually	Test flame detectors and spark/ember detectors in accordance with the manufacturer's published instructions to determine that each detector is operative. Determine flame detector and spark/ember detector sensitivity using any of the following:

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(7) Smoke detectors — functional test	X	Annually	(1) Calibrated test method
			(2) Manufacturer's calibrated sensitivity test instrument
			(3) Listed control unit arranged for the purpose
			(4) Other approved calibrated sensitivity test method that is directly proportional to the input signal from a fire, consistent with the detector listing or approval
			If designed to be field adjustable, replace detectors found to be outside of the approved range of sensitivity or adjust to bring them into the approved range. Do not determine flame detector and spark/ember detector sensitivity using a light source that administers an unmeasured quantity of radiation at an undefined distance from the detector.
(a) In other than one- and two-family dwellings, system detectors	X	Annually	^k Test smoke detectors in place to ensure smoke entry into the sensing chamber and an alarm response. ^j Use smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. Other methods listed in the manufacturer's published instructions that ensure smoke entry from the protected area, through the vents, <u>or</u> into the sensing chamber can be used. <u>Magnets are not acceptable for smoke entry tests.</u>
(b) Single- and multiple-station smoke alarms connected to protected premises systems	X	Annually	Perform a functional test on all single- and multiple-station smoke alarms connected to a protected premises fire alarm system by putting the smoke alarm into an alarm condition.
(c) System smoke detectors used in one- and two-family dwellings	X	Annually	Conduct functional tests according to <u>the</u> manufacturer's published instructions.
(d) Air sampling	X	Annually	Test with smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. In the absence of an automatic, listed airflow supervision feature, test from the end sampling port or point on each pipe run and verify airflow through all other ports or points.

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(e) Duct type	X	Annually	In addition to the testing required in Table 14.4.3.2 item (17)(7)(a) and Table 14.4.3.2 item (17)(8), test duct smoke detectors that use sampling tubes to ensure that they will properly sample the airstream in the duct using a method acceptable to the manufacturer or in accordance with their published instructions.
(f) Projected beam type	X	Annually	Test the detector by introducing smoke, other aerosol, or an optical filter into the beam path.
(g) Smoke detector with built-in thermal element	X	Annually	Operate both portions of the detector independently as described for the respective devices.
(h) Smoke detectors with control output functions	X	Annually	Verify that the control capability remains operable even if all of the initiating devices connected to the same initiating device circuit or signaling line circuit are in an alarm state.
—(8) Smoke detectors— sensitivity testing			
(8) In Smoke detectors in other than one- and two-family dwellings, system detectors — sensitivity testing	N/A	See 14.4.4.3	† Perform any of the following tests to ensure that each smoke detector is within its listed and marked sensitivity range:^k (1) Calibrated test method (2) Manufacturer's calibrated sensitivity test instrument (3) Listed control equipment arranged for the purpose (4) Smoke detector/control unit arrangement whereby the detector causes a signal at the control unit when its sensitivity is outside its listed sensitivity range (5) Other calibrated sensitivity test method approved by the authority having jurisdiction
(9) Carbon monoxide (CO) detectors/ carbon monoxide CO alarms connected to protected premises systems			

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(a) CO entry test	X	Annually	Test the devices in place to ensure CO entry to the sensing chamber by introduction through the vents, to the sensing chamber of listed and labeled product acceptable to the manufacturer or in accordance with manufacturer's published instructions.
(b) Air sampling	X	Annually	Per <u>In accordance with</u> test methods documented in the manufacturer's published instructions, verify detector alarm response through the end sampling port on each pipe run; verify airflow through all other ports as well.
(c) Duct type	X	Annually	Test or inspect air duct detectors to ensure that the device will sample the airstream in accordance with the manufacturer's published instructions.
(d) CO detector with control output functions	X	Annually	Within each protected space, verify that the control capability remains operable even if all of the initiating devices connected to the same initiating device circuit or signaling line circuit are in an alarm state.
(10) Initiating devices, supervisory			
(a) Control valve switch	X	Semiannually	Operate valve and verify signal receipt to be within the first two revolutions of the handwheel or within one-fifth of the travel distance, or per <u>in accordance with</u> the manufacturer's published instructions. Continue to cycle outside stem and yoke valves and verify switch does not reset during full travel of the valve stem.
(b) High- or low-air pressure switch	X	Annually	Operate switch and verify receipt of signal is obtained where the required pressure is increased or decreased a maximum 10 psi (70 kPa) from the required pressure level or in accordance with <u>the</u> manufacturer's published instructions.
(c) Steam pressure	X	Annually	Operate switch and verify receipt of signal is obtained before pressure decreases to 110 percent of the minimum operating pressure of the steam-operated equipment.
(d) Pressure supervisory devices for other sources	X	Annually	Operate switch and verify receipt of signal is obtained where the required pressure is increased or decreased from the normal operating pressure by an amount specified in approved design documents.
(e) Room temperature switch	X	Annually	Operate switch and verify receipt of signal to indicate the decrease in room temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C).

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(f) Water level switch	X	Annually	Operate switch and verify receipt of signal indicating the water level raised or lowered a maximum 3 in. (70 mm) from the required level within a pressure tank, or a maximum 12 in. (300 mm) from the required level of a nonpressure tank. Also verify its restoration <u>restoration</u> to required level.
(g) Water temperature switch	X	Annually	Operate switch and verify receipt of signal to indicate the decrease in water temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C). Water shall be flowed <u>Flow water</u> through an inspector's test connection indicating the flow of water equal to that from a single sprinkler of the smallest orifice size installed in the system or other listed and approved waterflow switch test methods for wet-pipe systems, or an alarm test bypass connection for dry-pipe, pre-action, or deluge systems in accordance with NFPA 25.
(11) Mechanical, electrosonic, or pressure-type waterflow device	X	Semiannually	(1-) Test each detector in accordance with the manufacturer's published instructions. Test each of the sensors present within the detector (e.g., smoke/ , heat/ , CO, etc.) independently for the specific detection principle, regardless of the configuration status at the time of testing, or <u>test</u> individual sensors together if the technology allows individual sensor responses to be verified; or where . <u>Where</u> sensors cannot be tested individually, test the primary sensor. ^m !
(12) Multi-sensor fire detector or multi-criteria fire detector or combination fire detector	X	Annually	(2-) Perform tests as described for the respective sensors by introduction of the physical phenomena to the sensing element. An electronic check (e.g., magnets, analog values, etc.) is not sufficient to comply with this requirement. (3-) Verify by using the detector manufacturer's published instructions that the test gas used will not impair the operation of any sensing chamber of a multi-sensor, multi-criteria, or combination fire detector. (4-) Confirm the result of the sensor(s) test(s) through indication at the detector or control unit. (5-) Record all tests and results.
18. Special hazard equipment			

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(1) Abort switch (dead-man type)	X	Annually	<u>Activate suppression system initiating device. Operate and hold the abort switch and verify correct sequence and operation. Verify that suppression system actuators remain de-energized after completion of discharge countdown. Release abort switch and verify that actuators energize.</u>
(2) Abort switch (recycle type)	X	Annually	<u>Activate suppression system initiating device. Operate abort switch and verify development of correct matrix with each sensor operated countdown cycle restarts and suppression system actuators remain de-energized. Allow countdown to complete and verify that actuators energize.</u>
(3) Abort switch (special type)	X	Annually	<u>Activate suppression system initiating device. Operate abort switch and verify correct sequence and operation in accordance with authority having jurisdiction. Observe sequencing the sequence of operation as specified on as-built drawings or in system owner's manual.</u>
(4) Cross-zone detection circuit	X	Annually	<u>Operate Activate one sensor or detector on in each zone. Verify occurrence of correct sequence with of operation of for the first zone and then with operation of the second zone.</u>
(5) Matrix-type circuit	X	Annually	<u>Operate all sensors in system. Verify development of correct matrix with each sensor operated.</u>
(6) Release solenoid circuit ^{ft m}	X	Annually	<u>Verify operation of solenoid.</u>
(7) Squibb release circuit	X	Annually	<u>Use AGI flashbulb or other test light approved by the manufacturer. Verify operation of flashbulb or light.</u>
(8) Verified, sequential, or counting zone circuit	X	Annually	<u>Operate required sensors at a minimum of four locations in circuit. Verify correct sequence of operation with both the first and second detector in alarm.</u>
(9) All above devices or circuits or combinations thereof	X	Annually	<u>Verify supervision of circuits by creating an open circuit.</u>
19. Combination systems			
(1) Fire extinguisher electronic monitoring device/system	X	Annually	<u>Test communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control unit FACU to ensure proper signals are received at the fire alarm control unit FACU and remote annunciator(s), if applicable.</u>

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
	(2) Carbon monoxide CO device/system	X	Annually	Test communication between the device connecting the carbon monoxide CO device/system and the fire alarm control unit FACU to ensure proper signals are received at the fire alarm control unit FACU and remote annunciator(s), if applicable.
20.	Interface equipment ^{o n}	X	See 14.4.4.4	Test interface equipment connections by operating or simulating the equipment being supervised. Verify signals required to be transmitted are received at the control unit. Test frequency for interface equipment is the same as the frequency required by the applicable NFPA standard(s) for the equipment being supervised.
21.	Guard's tour equipment	X	Annually	Test the device in accordance with the manufacturer's published instructions.
22.	Alarm notification appliances			For initial and reacceptance testing, measure sound pressure levels for alert tone signals and evacuation signal tones with a sound level meter meeting ANSI/ASA S1.4/Part 1, <i>Electroacoustics — Sound Level Meters — Part 1: Specifications</i> , Type 2 requirements. Measure sound pressure levels to determine if they are in compliance <u>comply</u> with Chapter 18 and the required performance, as documented per in accordance with 7.3.4. Set the sound level meter in accordance with ANSI/ASA S3.41, <i>Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI)</i> , using the time-weighted characteristic F (FAST).
	(1) Audible ^{p o}	X	N/A	^q For periodic testing, verify the operation of the notification appliances. ^p
		N/A	Annually	

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
	(2) Audible textual notification appliances (loudspeakers and other appliances to convey voice messages)	X	N/A	For initial and reacceptance testing, measure sound pressure levels for signals with a sound level meter meeting ANSI/ASA S1.4/Part 1, <i>Electroacoustics — Sound Level Meters — Part 1: Specifications</i> , Type 2 requirements. Measure sound pressure levels throughout the protected area to determine if they are in compliance <u>comply</u> with Chapter 18 and the required performance, as documented per in accordance with 7.3.4. Set the sound level meter in accordance with ANSI/ASA S3.41, <i>Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI)</i> , using the time-weighted characteristic F (FAST). Verify audible information to be intelligible and in compliance with 14.4.44 <u>12</u> .
		N/A	Annually	¶ For periodic testing, verify the operation of the notification appliances. [¶]
	(3) Visual	X	N/A	Perform initial and reacceptance testing in accordance with the manufacturer's published instructions. Verify appliance locations to be per in accordance with the approved layout and confirm that no floor plan changes affect the approved layout. Verify the candela rating or method of candela control marking on each visual appliance and rating when reported by the FACU agrees with the approved drawings. Confirm that each appliance flashes.
		N/A	Annually	For periodic testing, verify that each appliance flashes.
23. Exit marking audible notification appliance		X	Annually	Perform tests in accordance with <u>the</u> manufacturer's published instructions.
24. Emergency control functions ^{f g}		X	Annually	For initial, reacceptance, and periodic testing, verify emergency control function interface device activation. Where an emergency control function interface device is disabled or disconnected during initiating device testing, verify that the disabled or disconnected emergency control function interface device has been properly restored, including electromagnetic devices used for door releasing services as part of a fire alarm system.

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
25.	Two-way emergency communications systems	X	Annually	Use the manufacturer's published instructions and the as-built drawings provided by the system supplier to verify correct operation after the initial testing phase has been performed by the supplier or by the supplier's designated representative. Test the two-way communication system to verify operation and receipt of visual and audible signals at the transmitting unit and the receiving unit, respectively. Operate systems with more than five stations with a minimum of five stations operating simultaneously. Verify voice quality and clarity. Verify <u>the</u> directions for the use of the two-way communication system, <u>the</u> instructions for summoning assistance via the two-way communication system, and <u>that</u> written identification of the location is posted adjacent to the two-way communication system. Verify that all remote stations are readily accessible. Verify the timed automatic communications capability to connect with a constantly attended monitoring location <u>per in accordance with</u> 24.10.6.
26.	Special procedures			
	(1) Alarm verification	X	Annually	Verify time delay and alarm response for smoke detector circuits identified as having alarm verification.
	(2) Multiplex systems	X	Annually	Verify communications between sending and receiving units under both primary and secondary power. Verify communications between sending and receiving units under open-circuit and short-circuit trouble conditions. Verify communications between sending and receiving units in all directions where multiple communications pathways are provided. If a redundant control unit is provided, verify switchover of all required functions and operations of the secondary control unit. Verify all system functions and features in accordance with <u>the</u> manufacturer's published instructions.
27.	Supervising station alarm systems — receiving equipment			

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(1) All equipment	X	Monthly	Perform tests on all system functions and features in accordance with the equipment manufacturer's published instructions for correct operation in conformance with the applicable sections of Chapter 26. Actuate initiating device and verify receipt of the correct initiating device signal at the supervising station within 90 seconds. Upon completion of the test, restore the system to its functional operating condition. If test jacks are used, perform the first and last tests without the use of the test jack.
(2) Digital alarm communicator receiver (DACR)	X	Monthly	Disconnect each transmission means in turn from the DACR, and verify audible and visual annunciation of a trouble signal in the supervising station. Cause a signal to be transmitted on each individual incoming DACR line (path) at least once every 6 hours (24 hours for DACTs installed prior to adoption of the 2013 edition of <i>NFPA 72</i>). Verify receipt of these signals.
(3) Digital alarm radio receiver (DARR)	X	Monthly	Cause the following conditions of all DARRs on all subsidiary and repeater station receiving equipment. Verify receipt at the supervising station of correct signals for each of the following conditions: (1) AC power failure of the radio equipment (2) Receiver malfunction (3) Antenna and interconnecting cable failure (4) Indication of automatic switchover of the DARR (5) Data transmission line failure between the DARR and the supervising or subsidiary station
(4) McCulloh systems system	X	Monthly	Test and record the current on each circuit at each supervising and subsidiary station under the following conditions: (1) During functional operation (2) On each side of the circuit with the receiving equipment conditioned for an open circuit Cause a single break or ground condition on each transmission channel. If such a fault prevents the functioning of the circuit, verify receipt of a trouble signal.

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(5) Radio alarm supervising station receiver (RASSR) and radio alarm repeater station receiver (RARSR)	X	Monthly	Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station: (1) RF transmitter in use (radiating) (2) AC power failure supplying the radio equipment (3) RF receiver malfunction (4) Indication of automatic switchover Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station: (1) AC power failure supplying the radio equipment (2) RF receiver malfunction (3) Indication of automatic switchover, if applicable
(6) Private microwave radio systems	X	Monthly	Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station: (1) RF transmitter in use (radiating) (2) AC power failure supplying the radio equipment (3) RF receiver malfunction (4) Indication of automatic switchover
(7) Performance-based technologies	X	Monthly	Perform tests to ensure the monitoring of integrity of the transmission technology and technology path. Where a single communications path is used, disconnect the communication path. Verify that failure of the path is annunciated at the supervising station within 60 minutes of the failure (within 5 minutes for communication equipment installed prior to adoption of the 2013 edition of <i>NFPA 72</i>). Restore the communication path. Where multiple communication paths are used, disconnect both <u>all</u> communication paths and confirm that failure of the paths is annunciated at the supervising station within not more than 6 hours of the failure (within 24 hours for communication equipment installed prior to adoption of the 2013 edition of <i>NFPA 72</i>). Restore both <u>all</u> communication paths.

-	<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
28.	Public emergency alarm reporting system transmission equipment			Actuate publicly accessible initiating device(s) and verify receipt of not less than three complete rounds of signal impulses. Perform this test under normal circuit conditions. If the device is equipped for open circuit operation (ground return), test it in this condition as one of the semiannual tests.
	(1) Publicly accessible alarm box	X	Semiannually	Test each initiating circuit of the auxiliary box by actuation of a protected premises initiating device connected to that circuit. Verify receipt of not less than three complete rounds of signal impulses.
	(2) Auxiliary box	X	Annually	
	(3) Master box			
	(a) Manual operation	X	Semiannually	Perform the tests prescribed for 28(1).
	(b) Auxiliary operation	X	Annually	Perform the tests prescribed for 28(2).
29.	Low-power radio (wireless systems)	X	N/A	The following procedures describe additional acceptance and reacceptance test methods to verify wireless protection system operation: (1) Use the manufacturer's published instructions and the as-built drawings provided by the system supplier to verify correct operation after the initial testing phase has been performed by the supplier or by the supplier's designated representative. (2) Starting from the functional operating condition, initialize the system in accordance with the manufacturer's published instructions, including the following: (a) Confirm the alternative communications path exists between the wireless control unit and peripheral devices used to establish initiation, indication, control, and annunciation. Test the system for both alarm and trouble conditions.

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
-			(b) For initial and reacceptance testing, confirm the introduction of a fault in any Class A or <u>Class B</u> radio-frequency-specified pathway results in a trouble indication at fire alarm control unit <u>FACU</u>. Disconnect the power (i.e., remove primary batteries) from a radio transceiver initiating device, notification appliance, or controlled device and confirm the pathway performs as indicted in 23.16.4.8 and 23.16.4.9. Restore the system to normal and repeat the fault on not less than 10 percent of the radio frequency initiating devices, notification appliances, and controlled devices on every initiating device circuit radio pathway, notification appliance circuit radio pathway, and signaling line circuit radio pathway. Confirm all radio pathways perform as indicated in 23.16.4.8 and 23.16.4.9. (c) For periodic testing, test each Class A and <u>Class B</u> radio frequency initiating device circuit radio pathway, notification appliance circuit radio pathway, and signaling line circuit radio pathway for correct indication at the control unit. Confirm all radio pathways perform as indicated in 23.16.4.8 and 23.16.4.9. (3) Check batteries for all components in the system monthly unless the control unit checks all batteries and all components daily.
Mass notification 30. systems <u>system</u> (<u>MNS</u>)			
(1) Functions	X	Annually	At a minimum, test control unit to 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.
(2) Fuses	X	Annually	Verify the rating and supervision.
(3) Interfaced equipment	X	Annually	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.
(4) Lamps and LEDs	X	Annually	Illuminate lamps and LEDs.

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(5) Primary (main) power supply	X	Annually	Disconnect all secondary (standby) power and test under maximum load, including all alarm appliances requiring simultaneous operation. Reconnect all secondary (standby) power at end of test. For redundant power supplies, test each separately.
(6) Audible textual notification appliances (loudspeakers and other appliances to convey voice messages)	X	Annually	Measure sound pressure level with a sound level meter meeting ANSI/ASA S1.4/Part 1, <i>Electroacoustics — Sound Level Meters — Part 1: Specifications</i> , Type 2 requirements. Measure and record levels throughout protected area. Set the sound level meter in accordance with ANSI/ASA S3.41, <i>Audible Emergency Evacuation (E2) and Evacuation Signals with Relocation Instructions (ESRI)</i> , using the time-weighted characteristic F (FAST). Record the maximum output when the audible emergency evacuation signal is on. Verify audible information to be distinguishable and understandable. Perform test in accordance with manufacturer's published instructions. Verify appliance locations to be <u>per in accordance with the</u> approved layout and confirm that no floor plan changes affect the approved layout. Verify <u>that</u> the candela rating or method of candela control marking on each visual appliance and rating when reported by the FACU agrees with the approved drawings. Confirm that each appliance flashes.
(7) Visual	X	Annually	Review event log file and verify that the correct events were logged. Review system diagnostic log file; correct deficiencies noted in file. Delete unneeded log files. Delete unneeded error files. Verify that sufficient free disk space is available. Verify unobstructed flow of cooling air is available. Change/clean filters, cooling fans, and intake vents.
(8) Control unit functions and no diagnostic failures are indicated	X	Annually	Power down the central control unit computer and restart it.
(9) Control unit reset	X	Annually	If remote control software is loaded onto the system, verify that it is disabled to prevent unauthorized system access.
(10) Control unit security	X	Annually	Send out an alert to a diverse set of predesignated receiving devices and confirm receipt. Include at least one of each type of receiving device.
(11) Audible/visual functional test	X	Annually	Make full system software backup. Rotate backups based on accepted practice at site.
(12) Software backup	X	Annually	

<u>Component</u>	<u>Initial Acceptance</u>	<u>Periodic Frequency</u>	<u>Method</u>
(13) Secondary power test	X	Annually	Disconnect ac power. Verify the ac power failure alarm status on central control unit. With ac power disconnected, verify battery voltage under load.
(14) Wireless signals	X	Annually	Check forward/reflected radio power is within specifications.
(15) Antenna	X	Annually	Check forward/reflected radio power is within specifications. Verify solid electrical connections with no observable corrosion.
(16) Transceivers	X	Annually	Verify proper operation and mounting is not compromised.

N/A: Not applicable, no minimum requirement established.

^aSome transmission equipment (such as, but not limited to e.g., cable modems, fiber-optic interface nodes, and VoIP interfaces) are typically powered by the building's electrical system using a secondary (standby) power supply that does not meet the requirements of this Code. This is intended to ensure that the testing authority verifies full secondary (standby) power as required by Chapter 10. Additionally, refer to ~~Table 14.4.3.2, items 7 through 9;~~ for secondary (standby) power supply testing.

^bThe automatic transmission of the check-in (handshake) signal can take up to 60 minutes to occur.

^cSee ~~Table 14.4.3.2, Item item 4(1)~~ for the testing of transmission equipment. A control unit's charger/power supply that is listed for the purpose of verifying secondary power demand is permitted to be approved for equivalency with this section.

^dThe battery tests in ~~Table 14.4.3.2, Item item 9;~~ are based on VRLA batteries and it is the ~~intent~~ intended that the tests specified in (1) through (4) be performed in order. FACU automated load testing of VRLA batteries in accordance with ~~Table 14.4.3.2, Item item 9(5);~~ with record of ambient temperature is an acceptable alternative to prescriptive manual methods using test equipment. For other secondary battery types, refer to the battery manufacturer's published instructions or IEEE 450, *Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications*, for vented lead-acid batteries, and IEEE 1106, *Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications*, for nickel-cadmium batteries.

^e ~~If the charger is adjustable, adjust the output voltage to 2.265 volts per cell $\pm$ 0.015 volts at 77°F (25°C) or as specified by the alarm equipment manufacturer.~~

^f ~~See A.14.4.3.2 Item item 9(4). A load test per Item 9(5) is permitted in lieu of an ohmic test.~~

^g ~~See A.14.4.3.2 Item item 9(5).~~

^h ~~9~~ The voltmeter sensitivity has been changed from 1000 ohms per volt to 100 ohms per volt so that the false ground readings (caused by induced voltages) are minimized.

ⁱ ~~h~~ Initiating devices such as smoke detectors used for elevator recall, closing dampers, or releasing doors held in the open position that are permitted by the Code (see ~~9-6-3~~ 9.6.6 of *NFPA 101*) to initiate supervisory signals at the ~~fire alarm control unit (FACU)~~ should be tested at the same frequency (annually) as those devices when they are generating an alarm signal. They are not supervisory devices, but they initiate a supervisory signal at the FACU.

^j ~~i~~ Fusible thermal link detectors are commonly used to close fire doors and fire dampers electrically connected to the ~~fire alarm control unit~~ FACU. They are actuated by the presence of external heat, ~~which causes~~ causing a solder element in the link to fuse, or by an electric

thermal device; which, when energized, generates heat within the body of the link, causing the link to fuse and separate.

^k ~~j~~ Note, it ~~it~~ is customary for the manufacturer of the smoke detector to test a particular product from an aerosol provider to determine acceptability for use in smoke entry testing of their smoke detector/smoke alarm. Magnets are not acceptable for smoke entry tests.

^l ~~k~~ There are some detectors that use magnets as a manufacturer's calibrated sensitivity test instrument.

^m ~~l~~ For example, it might not be possible to individually test the heat sensor in a thermally enhanced smoke detector.

ⁿ ~~m~~ Manufacturer's published instructions should be consulted to ensure a proper operational test. No suppression gas or agent is expected to be discharged during the test of the solenoid. ~~See Test Plan of 14.2.10.~~

^o ~~n~~ A monitor module installed on an interface device is not considered a supervisory device and therefore not subject to the quarterly testing frequency requirement. Test frequencies for interface devices should be in accordance with the applicable standard. For example, fire pump controller alarms such as phase reversal are required to be tested annually. If a monitor module is installed to identify phase reversal on the ~~fire alarm control unit~~ FACU, it is not necessary to test for phase reversal four times a year.

^p ~~o~~ Chapter 18 would require 15 dB over average ambient sound for public mode spaces. Sometimes the ambient sound levels are different from what the design was based upon. Private operating mode would require 10 dB over average ambient at the location of the device.

^q ~~p~~ Where building, system, or occupancy changes have been observed, the owner should be notified of the changes. New devices might need to be installed and tested ~~per~~ in accordance with the initial acceptance testing criteria.

^r ~~q~~ See A.14.4.3.2 and ~~Table 14.4.3.2, Item item~~ 24.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
72_FR5349_14.4.3.2.docx	staff use	

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Fri Jul 22 08:50:42 EDT 2022

Committee Statement

Committee Item 17(7)(A) - The new sentence is moved from footnote K to the table to make it more
Statement: visible to the user.

Items 8 and 9, note c - Secondary batteries have become more of an issue for fire alarm systems. NFPA 72, during the last cycle, added requirements for batteries to be listed or component recognized. Chargers used today can offer so much more information, verification, testing data, etc. for the batteries connected to the system. This option allows manufacturers to have their FACUs listed to offer these functions and if a listing should be deemed equivalent to the use of battery testers. This is similar to smoke detector sensitivity testing where a FACU can provide that testing is listed for the purpose.

Items 9 (2) and 9(4), note e and note f - A task group was set up to conduct an extensive, detailed review of each table footnote and determined what could be moved into the

testing table itself and what should remain as a table footnote. In accordance with the Manual of Style, mandatory language should reside in the table and not in the footnote.

Item 17(4)(c) - The sentence was revised to clarify the functional testing methods.

Item 18 - The testing of abort switches currently refers to the sequence of operation for development of and/or verification of the system sequence of operation for simple abort function. The test requirement is vague and the sequence of operation should have already been determined prior to acceptance testing. This revision clarifies the testing of an abort switch.

Items 4(6), 10, 17(11) - Manual of style does not permit requirements in tables.

Response FR-5349-NFPA 72-2022

Message:

[Public Input No. 368-NFPA 72-2022 \[Section No. 14.4.3.2\]](#)

[Public Input No. 58-NFPA 72-2022 \[Section No. 14.4.3.2\]](#)

[Public Input No. 473-NFPA 72-2022 \[Section No. 14.4.3.2\]](#)

[Public Input No. 326-NFPA 72-2022 \[Section No. 14.4.3.2\]](#)

[Public Input No. 31-NFPA 72-2021 \[Section No. 14.4.3.2\]](#)

[Public Input No. 512-NFPA 72-2022 \[Section No. 14.4.3.2\]](#)

[Public Input No. 318-NFPA 72-2022 \[Section No. 14.4.3.2\]](#)

[Public Input No. 30-NFPA 72-2021 \[Section No. 14.4.3.2\]](#)



First Revision No. 5336-NFPA 72-2022 [New Section after 14.4.3.3]

14.4.3.4

Thermal image fire detectors shall be inspected, tested, and maintained in accordance with the manufacturer's published instructions.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 15:38:25 EDT 2022

Committee Statement

Committee Statement: Thermal image fire detectors are much like video image smoke and flame detectors and they should be inspected, tested, and maintained in accordance with manufacturer's instructions.

Response FR-5336-NFPA 72-2022

Message:

[Public Input No. 275-NFPA 72-2022 \[New Section after 14.4.3.3\]](#)



First Revision No. 5371-NFPA 72-2022 [Section No. 14.4.4 [Excluding any Sub-Sections]]

Unless otherwise permitted by other sections of this Code, testing shall be performed in accordance with the authority having jurisdiction or with the schedules provided in Table 14.4.3.2 or more often if required by the authority having jurisdiction, whichever is more frequent.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Sep 08 17:22:28 EDT 2022

Committee Statement

Committee Statement: Editorially aligns frequency statement with 14.3.1

Response Message: FR-5371-NFPA 72-2022



First Revision No. 5339-NFPA 72-2022 [Section No. 14.4.4.1]

14.4.4.1*

Devices or equipment that are inaccessible for safety considerations (e.g., continuous process operations, energized electrical equipment, radiation, and excessive height) shall be permitted to be tested during scheduled shutdowns if approved by the authority having jurisdiction: ~~Extended intervals shall~~ and if the extended intervals do not exceed 18 months.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 16:26:09 EDT 2022

Committee Statement

Committee Statement: The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response Message: FR-5339-NFPA 72-2022

Message:

Public Input No. 59-NFPA 72-2022 [Section No. 14.4.4.1]



First Revision No. 5340-NFPA 72-2022 [Section No. 14.4.4.2]

14.4.4.2

If automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, the manual testing frequency shall be permitted to be extended to annually: in accordance with Table 14.4.3.2 ~~shall apply~~.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 16:35:49 EDT 2022

Committee Statement

Committee Statement: The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response FR-5340-NFPA 72-2022

Message:

Public Input No. 60-NFPA 72-2022 [Section No. 14.4.4.2]



First Revision No. 5341-NFPA 72-2022 [Section No. 14.4.4.5.5]

14.4.4.6

Carbon monoxide apparatus that require resetting to maintain normal operation shall be restored to normal as promptly as possible after each test and alarm and kept in normal condition for operation. ~~All test signals received shall be recorded to indicate date and time.~~

14.4.4.6.1

All carbon monoxide test signals received shall be recorded to indicate date and time.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Thu Jul 21 16:39:30 EDT 2022

Committee Statement

Committee Statement: The section number was corrected. In addition, the Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response Message: FR-5341-NFPA 72-2022

[Public Input No. 256-NFPA 72-2022 \[Section No. 14.4.4.5.5\]](#)

[Public Input No. 61-NFPA 72-2022 \[Section No. 14.4.4.5.5\]](#)



First Revision No. 5353-NFPA 72-2022 [Section No. 14.4.11.3]

14.4.12.3

Quantitative measurements as described in Annex D shall be permitted ~~but shall not be required~~.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Fri Jul 22 09:56:37 EDT 2022

Committee Statement

Committee Statement: The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response: FR-5353-NFPA 72-2022

Message:

[Public Input No. 62-NFPA 72-2022 \[Section No. 14.4.11.3\]](#)



First Revision No. 5354-NFPA 72-2022 [Section No. 14.6.1.3]

14.6.1.3

The system owner shall be responsible for maintaining these records for the life of the system for examination by any authority having jurisdiction. ~~Paper or electronic media shall be permitted.~~

14.6.1.4

Paper or electronic media shall be permitted.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Fri Jul 22 09:57:53 EDT 2022

Committee Statement

Committee Statement: The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response: FR-5354-NFPA 72-2022

Message:

[Public Input No. 63-NFPA 72-2022 \[Section No. 14.6.1.3\]](#)



First Revision No. 5355-NFPA 72-2022 [Section No. 14.6.2.1]

14.6.2.1

~~Records shall be retained~~ The system owner shall be responsible for retaining maintenance, inspection, and testing records until the next test and for 1 year thereafter.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Fri Jul 22 09:59:58 EDT 2022

Committee Statement

Committee Permanent Records are identified as the responsibility of the building owner to maintain.

Statement: ITM records, however, are not assigned to any entity for retention. This revision assigns the responsibility for these types of records to the same entity as for permanent records in order to eliminate any uncertainty as to who is ultimately responsible for retention, especially when examination of these records is required by the AHJ.

Response FR-5355-NFPA 72-2022

Message:

Public Input No. 561-NFPA 72-2022 [Section No. 14.6.2.1]



First Revision No. 5356-NFPA 72-2022 [Section No. 14.6.2.3]

14.6.2.3

The records shall be on a medium that will survive the retention period. ~~Paper or electronic media shall be permitted.~~

14.6.2.4

Paper or electronic media shall be permitted.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Fri Jul 22 10:04:05 EDT 2022

Committee Statement

Committee Statement: The Manual of Style for NFPA Technical Committee Documents, July 2004 Edition section 1.8.3 requires sections containing multiple requirements subdivided into subsections, which shall be further subdivided into paragraphs of text.

Response: FR-5356-NFPA 72-2022

Message:

[Public Input No. 65-NFPA 72-2022 \[Section No. 14.6.2.4\]](#)

[Public Input No. 64-NFPA 72-2022 \[Section No. 14.6.2.3\]](#)



First Revision No. 5358-NFPA 72-2022 [Section No. A.14.4.3]

A.14.4.3

Fire alarm system testing can be conducted using silent testing and the bypassing of emergency control functions. All input signals should be verified according to the system ~~matrix~~ sequence of operation to ensure they create the appropriate outputs. Tests of audible notification appliances and emergency control functions should be conducted at the conclusion of satisfactory tests of all inputs.

The intent is to reduce the amount of time spent causing audible and visual occupant notification during tests in an occupied building. This ~~reduction~~ will ~~help reduce~~ decrease the negative (cry wolf) impact on occupants caused by excessive operation of notification appliances. System printouts or history logs are an effective way of verifying the correct receipt of signals. However, many outputs such as occupant notification and emergency control functions are tested for correct operation; because logs do not necessarily verify operation of the system output. Operation of audible and visual notification appliances could be accomplished in a lump sum fashion after all inputs are proven correct by silent testing. All inputs tested in this manner must be proved to cause the appropriate signal by verifying alarm receipt at the controls as each device is actuated. Manufacturer-specific protocols such as “walk test” or “alarm bypass” are an acceptable means of testing under this section. Other methods of mitigating the negative impact include off-hours tests when the building is not occupied.

Submitter Information Verification

Committee: SIG-TMS

Submittal Date: Fri Jul 22 10:23:03 EDT 2022

Committee Statement

Committee Statement: The code currently allows a sequence of operation to be defined in narrative form or an input/output matrix. Changing the text to the more generic term acknowledges the narrative form, matrix, or other acceptable documents that define the sequence of operation.

Response: FR-5358-NFPA 72-2022

Message:

[Public Input No. 376-NFPA 72-2022 \[Section No. A.14.4.3\]](#)



First Revision No. 5359-NFPA 72-2022 [Section No. A.14.6.1.1]

A.14.6.1.1

One method Examples of acceptable methods used to define the required sequence of operations and to document the actual sequence of operations is include a logic diagram .[see Figure A.14.6.1.1(a).] and an input/output matrix { [see Figure A.14.6.1.1 Figure A.14.6.1.1(b).}].

Figure A.14.6.1.1(a) Typical Logic Diagram.

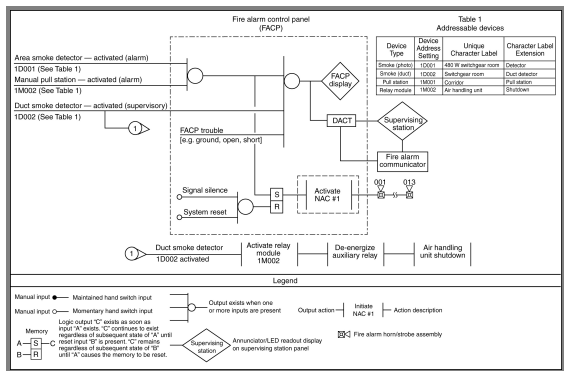


Figure A.14.6.1.1(b) Typical Input/Output Matrix.

Figure A.14.6.1.1(b) is a typical input/output matrix. It is a large table with columns for System Inputs (A through Z) and System Outputs (A through Z). The rows represent various input and output devices, such as Manual fire alarm boxes, Smoke detectors, and Duct smoke detectors. The matrix uses 'X' marks to indicate active connections between specific inputs and outputs.

Supplemental Information

File Name	Description	Approved
72_FR5359_Fig_A.14.6.1.1_a_NEW.docx	STAFF USE	

Submitter Information Verification

Committee: SIG-TMS
Submittal Date: Fri Jul 22 10:28:10 EDT 2022

Committee Statement

Committee Statement: The revision adds logic diagrams as a means to depict the sequence of operation.

Public Input No. 463-NFPA 72-2022 [Section No. A.14.6.1.1]

[Public Input No. 577-NFPA 72-2022 \[Section No. A.14.6.1.1\]](#)