INSPECTION, TESTING, AND MAINTENANCE OF FIRE PROTECTION & LIFE SAFETY SYSTEMS

NIST S 7401.02
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1. PURPOSE

The purpose of this suborder is to establish requirements and associated roles and responsibilities related to inspection, testing, and maintenance (ITM) of fire protection and life safety systems on NIST-owned and operated sites.

2. BACKGROUND

a. NIST Policy (P) 7400.00: *Fire and Life Safety*, articulates NIST's commitment to making fire and life safety an integral core value and vital part of the NIST culture, in part by complying with applicable laws, regulations, and other promulgated fire and life safety requirements.

b. NIST Order (O) 7401.00: *Fire and Life Safety*, details the duties and powers of the NIST Authority Having Jurisdiction (AHJ)[2] with respect to inspection, testing, and maintenance of fire protection and life safety systems.

3. APPLICABILITY

a. The provisions of this suborder apply to the following fire protection and life safety systems on NIST-owned and operated sites:

i. Fire alarm systems;

ii. Fixed fire suppression systems;

iii. Handheld fire extinguishing systems;

[1] For revision history, see Appendix A.
[2] The NIST AHJ may delegate the authority to carry out any AHJ responsibilities to other Fire Protection Engineers in the Office of Safety, Health, and Environment.

iv. Fire and smoke control (and compartmentation) systems;

v. Emergency and standby power systems;

vi. Explosion prevention and control systems;

vii. Commercial cooking suppression systems;

viii. Elevator emergency operation systems;

ix. Means of egress and associated systems;

x. Monitored life safety systems; and

xi. Local (non-monitored) life safety systems.

4. REFERENCES

a. International Building Code- Chapter 17: Special Inspections and Tests

b. American Society of Mechanical Engineers (ASME) A17.1, *Safety Code for Elevators and Escalators*

c. National Fire Protection Association (NFPA) 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*.

d. NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*.

e. NFPA 10, *Standard for Portable Fire Extinguishers*.

f. NFPA 11, *Low, Medium, and High-Expansion Foam*.

g. NFPA 12, *Standard for Carbon Dioxide Extinguishing Systems*.

h. NFPA 13, *Standard for Installation of Sprinkler Systems*.

i. NFPA 15, *Water Spray Fixed Systems for Fire Protection*.

j. NFPA 16, *Installation of Foam-Water Sprinkler and Foam-Water Spray Systems.*

k. NFPA 17, *Standard for Dry Chemical Extinguishing Systems.*

l. NFPA 17A, *Wet Chemical Extinguishing Systems*.

m. NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*.

n. NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

o. NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*.

p. NFPA 68, *Standard on Explosion Protection by Deflagration Venting*.

q. NFPA 69, *Standard on Explosion Prevention Systems*.

r. NFPA 72, *National Fire Alarm and Signaling Code*.

s. NFPA 80, *Standard for Fire Doors and Other Opening Protectives*.

t. NFPA 90A, *Standard for Installation of Air-Conditioning and Ventilating Systems*.

u. NFPA 90B*, Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*.

v. NFPA 92, *Standard for Smoke Control Systems*.

w. NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*.

x. NFPA 101, *Life Safety Code*.

y. NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*.

z. NFPA 110, *Standard for Emergency and Standby Power Systems*.

aa. NFPA 111, *Standard for Stored Electrical Energy Emergency and Standby Power Systems*.

bb. NFPA 204, *Standard for Smoke and Heat Venting*.

cc. NFPA 291, *Recommended Practice for Fire Flow Testing and Marking of Hydrants*.

dd. NFPA 720*, Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*.

ee. NFPA 750, *Water Mist Fire Protection Systems*.

ff. NFPA 2001, *Clean Agent Fire Extinguishing Systems*.

5. APPLICABLE NIST DIRECTIVES

a. NIST P 7400.00: *Fire and Life Safety*

b. NIST O 7401.00: *Fire and Life Safety*

c. NIST S 7401.01: *Fire Protection & Life Safety Systems for Design and Construction*

d. NIST S 7401.03: *Impairment of Fire Protection and Life Safety Systems*

e. NIST S 7101.52: *Cryogen Safety*

f. NIST S 7101.60: *Chemical Management*

g. NIST S 7101.61: *Compressed Gas Safety*

6. REQUIREMENTS

a. System Commissioning (*i.e.*, Acceptance Testing)

(1) Newly installed and modified existing fire protection and life safety systems shall undergo pre-functional testing in accordance with the relevant codes identified in Section 6b of this document, prior to acceptance testing.

(2) Pre-testing documentation shall be provided to the NIST AHJ at least one (1) week prior to scheduling final acceptance testing.

(a) Shorter notification periods are acceptable for projects lasting less than 30 days.

(3) Newly installed and modified existing fire protection and life safety systems shall undergo acceptance testing in accordance with:

(a) NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*; and

(b) System specific codes identified in Section 6.b of this document.

(4) The NIST AHJ shall witness acceptance testing of all newly installed and modified existing fire protection and life safety systems.

(a) A written (including electronic) notice of the acceptance testing shall be provided to the NIST AHJ and should be sent at least two (2) weeks[3] prior to the scheduled date.

i. The acceptance testing notice shall include an updated set of as-built drawings of the system(s) to be tested.

(b) Where feasible, acceptance testing shall be conducted during normal business hours (8:00 am to 5:00 pm), Monday through Friday.

b. Fire Protection and Life Safety System Inspection, Testing, and Maintenance (see Appendix B for a consolidated list of ITM requirements from the NIST adopted codes and standards[4]).

(1) Fire Alarm Systems

(a) Fire alarm systems (*e.g.*, smoke detectors, heat detectors, UV/IR detectors, beam detectors, strobes, horns, speakers, control panels) shall be inspected, tested, and maintained in accordance with NFPA 72, *National Fire Alarm and Signaling Code*.

i. The following requirements shall apply for acceptance testing of fire alarm systems:

(i) Pre-functional testing shall include 100% of new devices and the accuracy of graphics and labels shall be verified.

(ii) Final graphics and device labels shall be completed and provided to the NIST AHJ prior to acceptance testing.

(iii) Graphics and labels at all three (3) NIST Graphical Command Centers in Gaithersburg shall be verified during acceptance testing when new fire alarm panels are placed onto the system.

(iv) The fire alarm control panel(s) shall be free and clear of trouble conditions for 7-days prior to NIST network connection.

(v) The Fire Alarm Control Panel batteries shall undergo standby testing to ensure that they are capable of supporting the system for the standby duration requirements set forth in *NIST S 7401.01: Fire Protection & Life Safety Systems for Design and Construction*.

[3] Where necessary and feasible, a shorter notification period may be approved by the NIST AHJ.

[4] Some ITM frequencies, as specified within the codes, have been modified by the NIST AHJ; 24/7 remote monitoring of system trouble, supervisory, and alarm statuses replaces the need for high frequency inspection cycles .

(vi) All smoke detectors shall be field tested using either a listed canned aerosol smoke approved by the manufacturer or other method approved by the manufacturer. Detectors shall not be tested using magnets.

(vii) All duct-mounted smoke detectors shall be field tested by introducing smoke directly into the sampling tube within the ductwork or according to manufacturer's recommendations. Detectors shall not be tested using magnets.

(viii) All heat detectors shall be tested using a heat gun for rate-of-rise following manufacturer's recommended temperature setting and distance between the heat gun and detector head. Detectors shall not be tested using magnets.

(ix) Prerecorded messages and voice announcements shall be verified as intelligible per the testing methods outlined in Annex D of NFPA 72.

ii. Modifications to the programming of fire alarm systems shall meet the requirements set forth in Section 14.4.2.5 of NFPA 72, *National Fire Alarm and Signaling Code*, which states "Changes to the system executive software shall require a 10 percent functional test of the system, including a test of at least one device on each input and output circuit to verify critical system functions such as notification appliances, control functions, and off-premises reporting."

(b) Life safety systems monitored on the fire alarm system shall be inspected, tested, and maintained in accordance with NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, as well as the requirements listed below for each specific device.

i. Carbon monoxide detectors shall be inspected, tested, maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code*; and

(ii) NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*.

ii. Combustible gas detectors (*e.g.*, hydrogen, natural gas, propane) shall be inspected, tested, and maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code*; and

(ii) Manufacturer instructions.

iii. Oxygen depletion sensors shall be inspected, tested, and maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code*; and

(ii) Manufacturer instructions.

iv. Toxic gas detectors shall be inspected, tested, and maintained in accordance with:

(i) NFPA 72, *National Fire Alarm and Signaling Code*; and

(ii) Manufacturer instructions.

v. Automated external defibrillator (AED) cabinet alarms shall be inspected, tested, and maintained in accordance with NFPA 72, *National Fire Alarm and Signaling Code*.

(c) Mechanical and electrical devices monitored on the fire alarm system (*e.g.*, water detection, freeze stat, pumps, heaters, fans, breakers) shall be inspected, tested, and maintained in accordance with manufacturer instructions and shall be maintained in such a manner that the fire alarm system is kept free of reoccurring or standing trouble conditions and nuisance alarms resulting from a failure of the device.

i. Only mechanical and electrical devices that are deemed "critical" for monitoring shall be approved by the NIST AHJ to be added to the fire alarm system.

(2) Fixed Fire Suppression Systems

(a) Water-Based Fire Protection Systems

i. Sprinkler systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 13, *Standard for Installation of Sprinkler Systems*; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

ii. Standpipe and hose systems shall be inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

iii. Private fire service mains shall be inspected, tested, and maintained in accordance with:

(i) NFPA 291, *Recommended Practice for Fire Flow Testing and Marking of Hydrants*; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

iv. Fire pumps shall be inspected, tested, and maintained in accordance with:

(i) NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

v. Water spray fixed systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 15, *Water Spray Fixed Systems for Fire Protection*; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

vi. Foam-water sprinkler systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*; or

(ii) NFPA 16, *Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*; and

(iii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

vii. Water mist systems shall be inspected, tested, and maintained in accordance with:

(i) NFPA 750, *Water Mist Fire Protection Systems*; and

(ii) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

viii. Valves (*e.g.*, control, alarm, check, pre-action, deluge, dry pipe, relief, backflow, fire department connections), valve components, trim, and piping shall be inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

(b) Non-Water-Based Fire Protection Systems

i. Carbon dioxide extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 12, *Standard for Carbon Dioxide Extinguishing Systems*.

ii. Dry chemical extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 17, *Standard for Dry Chemical Extinguishing Systems*.

iii. Wet chemical extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*.

iv. Clean agent extinguishing systems shall be inspected, tested, and maintained in accordance with NFPA 2001, *Standard for Clean Agent Fire Extinguishing Systems*.

(c) Commercial Cooking Suppression Systems

i. Commercial cooking systems shall be inspected, tested, and maintained in accordance with NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*.

(3) Handheld Fire Extinguishing Systems

(a) Handheld fire extinguishers (*e.g.*, water-type, dry chemical, wet chemical, carbon dioxide, halogen agent) shall be maintained in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*.

(4) Fire and Smoke Control (and Compartmentation) Systems

(a) Fire doors shall be inspected, tested, and maintained in accordance with NFPA 80, *Standard for Fire Doors and Other Opening Protectives*.

(b) Air-conditioning, heating, ventilating ductwork, and related equipment, including smoke dampers and combination fire and smoke dampers shall be inspected, tested, and maintained in accordance with:

i. NFPA 90A, *Standard for Installation of Air-Conditioning and Ventilating Systems*; and

ii. NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*.

(c) Smoke control systems shall be inspected, tested, and maintained in accordance with NFPA 92, *Standard for Smoke Control Systems*.

(d) Smoke dampers and combination fire and smoke dampers shall be inspected, tested, and maintained in accordance with NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*.

(e) Smoke and heat venting systems shall be inspected, tested, and maintained in accordance with NFPA 204, *Standard for Smoke and Heat Venting*.

(5) Emergency and Standby Power Systems

(a) Emergency and standby power systems providing secondary power to fire protection and life safety systems shall be inspected, tested, and maintained in accordance with:

i. NFPA 110, *Standard for Emergency and Standby Power Systems*; or

ii. NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*.

(6) Explosion Prevention and Control Systems

(a) Deflagration vents shall be inspected, tested, and maintained in accordance with NFPA 68, *Standard on Explosion Protection by Deflagration Venting*.

(b) Explosion prevention systems shall be inspected, tested, and maintained in accordance with NFPA 69, *Standard on Explosion Prevention Systems*.

(7) Elevator Emergency Operation Systems

(a) Elevator emergency operations (*e.g.*, firefighter operation, recall, and shunt trip) shall be inspected, tested, and maintained in accordance with:

i. NFPA 101, *Life Safety Code*; and

ii. ASME A17.1, *Safety Code for Elevators and Escalators*.

(8) Means of Egress and Associated Systems

(a) Means of egress (*e.g.*, corridors[5], hallways, stairwells, vestibules, walkways) and associated systems (*e.g.*, doors, turnstiles, locks, latches, stairs, railings, exit signs, emergency lights, elevators) shall be inspected, tested, maintained in accordance with Chapter 7 of NFPA 101, *Life Safety Code*, as interpreted by the NIST AHJ, and in accordance with the following (All

[5] Laboratory Service Galleys are not considered a corridor, but a support space for the labs, thus the requirements of 6.b.(8) do not apply to these spaces.

allowances provided in this Suborder are subject to review and approval by the NIST AHJ):

i. Building corridors shall be inspected semi-annually for compliance with the requirements identified in this section.

ii. Minimum Corridor Width

(i) A minimum 44-inch width of clear and unobstructed egress must be maintained in all corridors that serve an occupant load of 50 or more in all NIST buildings. Corridors serving less than 50 occupants are permitted to have a minimum width of 36 inches.

a. In some corridors, the minimum clear width of 44-inches may not be sufficient for emergency egress due to the existing occupant load of the building. In these cases, the NIST AHJ has the authority to require a greater corridor clear width to be maintained

(ii) The use of the required clear width for temporary storage of construction material, equipment scheduled for installation, supplies pending movement into labs or offices, surplus materials or similar items which would jeopardize area occupants is prohibited.

(iii) Bulletin or chalkboards or similar items attached to the wall may extend into the clear space; however, displays which extend into the clear space by more than 4 inches are not permitted.

(iv) Temporary parking of an occasional utility cart, which may be quickly moved by the occupants to provide full access, is permitted. Locations for such equipment shall be provided on the side of the corridor authorized for equipment or storage.

iii. Allowances, Restrictions and Requirements for Corridor Use[6]

(i) All items permitted to be stored in the corridor must be noncombustible or located in a noncombustible cabinet.

a. This requirement permits storage in standard file cabinets and similar metal furnishings. Combustible materials (e.g., paper, wood, plastic or similar materials) are to be stored within the cabinets. Storage on top of cabinets is not allowed in order to eliminate potential injury from material

[6] The requirements of this section do not apply to vestibules or lobbies that are clearly distinctive from the corridor.

or equipment that may become accidentally dislodged.

(ii) Any storage permitted in corridors by this document is restricted to one side of the corridor. The same side should be utilized in all corridors on the same floor.

a. In general, the side of the corridor designated for storage or equipment use shall be the side of the corridor opposite the stairwell door to ensure that, under emergency conditions, there will be no impediments to reaching the stairwell. However, in some corridors, projections may already exist due to structural building elements such as columns projecting from the side of the corridor normally preferred as the "clear" side. Where this condition exists, utilization is limited to the side with the permanent existing projections.

b. In buildings where access to a stairwell or horizontal exit is in the end wall of the corridor, the OU which owns the spaces served by the corridor shall establish which side will be used for materials or equipment. The selected side shall be uniform throughout all connecting corridors on the same floor. Where multiple OUs own spaces served by these corridors, a mutual agreement should be made. If necessary, OSHE may be consulted to make the determination.

(iii) Location of material or equipment shall not prevent emergency access to exit doorways.

a. A 60-inch clear space shall be provided on both sides of all exit doors, including stairwell doors. A 12-inch clear space shall be provided on both sides of all non-exit doors serving an occupied space. All doors must be provided with adequate clear space to open the door to full swing.

(iv) Location of material or equipment shall not prevent emergency access to emergency equipment.

a. All emergency equipment; including safety showers, eyewashes, sprinkler valves, fire alarm pull stations, fire alarm panels, and fire extinguishers, must be maintained with full and unobstructed access at all times.

b. Storage or equipment placement shall not visually block fire alarm devices or exit signage.

(v) Location of material or equipment shall not impede upon clear spaces for electrical panels established by OSHA in 29 CFR 1910.303(g).

(vi) Storage and use, as specified, of the items listed below is prohibited in corridors. Nothing in this section prohibits the incidental use of the corridor for delivery of restricted materials, the movement of such items from room to room, or similar activities.

a. Combustible Furniture: Combustible furniture shall not be stored or used in the corridor. Furniture constructed of noncombustible or factory-applied fire retardant treated materials are permitted. Temporary storage of combustible furniture during office or lab renovations may be permitted with prior approval by NIST Fire and Facilities Safety Group (FFSG).

b. Flammable or combustible liquids: Flammable or combustible liquids shall not be stored or used in the corridor. This includes flammable or combustible liquids located within a flammable liquid storage cabinet.

c. Hazardous chemicals: The manipulation or storage of the following types of chemicals in the corridor is prohibited: (1) chemicals that are reactive or may become reactive; (2) explosive compounds; (3) compounds that are capable of creating a single, acute toxic exposure if released; (4) highly corrosive or strong oxidizers that may react violently with other materials; (5) known chemical carcinogens that could easily contaminate an area or unnecessarily expose personnel; (6) temperature sensitive; and (7) waste chemicals of any nature. The NIST *Chemical/Regulated Waste Pickup Request System* describes specific disposal procedures for the following types of waste: chemical, biohazardous, and battery.

d. Compressed gas cylinders (all sizes): Compressed gas cylinders shall not be stored or used in the corridor.

e. Liquefied gases: Liquified gases shall not be stored or used in the corridor.

f. Radioactive materials: Use or storage of radioactive materials in corridors is specifically prohibited. Radioactive wastes are not to be placed in corridors in preparation for pick up by disposal personnel. Nothing in this section would preclude the transportation of sources or radioactive specimens through the corridors; however, such activities are to be conducted in a manner which minimizes the chances of contamination

through spillage or breakage and maintains radiation levels within acceptable limits.

g. Materials or equipment which present a significant physical, mechanical, or electrical hazard to occupants using the corridor shall not be stored or used in the corridor.

h. Construction Materials: Construction materials may be stored *temporarily* in the corridor during the workday, as long as the minimum prescribed clear corridor width is maintained. Construction materials shall not remain in the corridor overnight. Equipment and supplies shall not, under any circumstances, be stored in stairwells.

i. Excess Property: Equipment and supplies cannot be abandoned in corridors or stairwells. Transfer or dispose of unneeded property by notifying the organization's designated Property Custodian of the desired action. Refer to NIST's Personal Property Disposal Office's (PPDO) procedure for guidance on reporting excess property. Per PPDO policy, all excess property that is scheduled for removal must be placed in a secured area.

(1) In cases where a corridor is considered a "secured area", the following shall apply: Combustible excess property shall not be stored in the corridor while awaiting removal, except on the day of scheduled pick up. Noncombustible excess property is permitted to be stored in the corridor for a maximum of 3 days. The property should be labeled with the scheduled date of pick up and the owner's contact information. Any property that is not labeled will be assumed to have been in the corridor for more than 3 days and the owner will be requested to immediately remove the item(s). In all cases, the minimum required width of the corridor shall be maintained at all times.

j. Trash and Recycling Bins: Large containers for the storage/disposal of trash or recyclable materials, other than those provided by OFPM, shall not be stored in the corridor. Rolling trash bins or carts are permitted temporarily in corridors. Trash or recycling bins that have a capacity of 7 gallons or less may be temporarily placed in corridors outside of offices and labs for pick-up by NIST custodial staff.

k. Combustible Crates and Boxes: Empty combustible crates and boxes, assembled or disassembled, shall not be stored in the corridor. Equipment

located in crates or boxes and pending movement into labs is permitted to be stored temporarily in corridors for a maximum of 7 days, provided the minimum corridor width is not reduced. Each individual crate or box should be labeled with the date it was received and the owner's contact information. Any crate or box that is not labelled will be assumed to have been in the corridor for more than 7 days and the owner will be requested to immediately remove the crate or box.

l. Combustible Pallets: Empty combustible pallets shall not be stored in the corridor. Items pending movement into labs or offices may be located on pallets, provided the items are not prohibited by other sections of this document.

m. Items that encourage the congregation of people, such as food or vendor tables, are prohibited in corridors, unless the corridor has been specifically designed for this purpose. The corridors adjacent to Building 101's Red and Green auditoriums are examples of areas that have been designed to support the use of the auditoriums and are therefore exempt from this requirement.

(vii) Combustible items are permitted in break areas, provided these items serve the purpose of the break area. Break areas are permitted to be open to a corridor, within alcoves, within recessed areas, or within rooms with cased openings.

(viii) Printers, scanners, and copy machines which do not utilize flammable liquids are permitted within recessed areas of a corridor. Replacement paper supply in excess of two full printer replacements shall not be stored at these locations.

iv. Organizational Unit Guides and Restrictions

(i) An Organizational Unit (OU) that occupies an entire building, or an entire floor of a building may establish additional guides and restrictions for corridor use in buildings or areas under its control, providing such guides and restrictions do not conflict with this NIST suborder. Local guides and restrictions must be reviewed and approved by NIST FFSG prior to becoming effective.

(9) Local (Non-Monitored) Life Safety Systems

(a) The following local (non-monitored) detectors/sensors shall be inspected, tested, and maintained in accordance with manufacturer instructions:

i. Carbon monoxide detectors;

ii. Combustible gas detectors (*e.g.*, hydrogen, natural gas, propane);

iii. Oxygen depletion sensors; and

iv. Toxic gas detectors

(i) The criteria set forth in Section 7.9.6.3 of NFPA 55, *Compressed Gases and Cryogenic Fluids*, must be met for a locally monitored systems to be deemed acceptable.

(10) Equipment Safety Systems and Interlocks

(a) Equipment safety systems and interlocks designed to stop the flow of hazard chemicals to equipment or tools upon detection of smoke or fire shall be inspected, tested, and maintained in accordance with manufacturer instructions.

(b) Systems providing inputs to the fire alarm systems shall also be inspected, tested, and maintained in accordance with:

i. NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*; and

ii. NFPA 72, *National Fire Alarm and Signaling Code*.

(11) Fire-Resistant and Firestop Systems

(a) Newly installed intumescent fire-resistant coatings, mastic fire-resistant coatings, sprayed fire-resistant materials shall be inspected and tested in accordance with Chapter 17 of the International Building Code.

(b) Newly installed firestopping systems shall be inspected and tested in accordance with Chapter 17 of the International Building Code.

i. The NIST AHJ shall be consulted prior to the start of any work to determine the percentage of witnessed installations or destructive testing required for the project.

(c) Existing fire-resistant or firestop systems shall not be disturbed or altered from their original installed condition. If work requires removal of an existing fire-resistant or firestop system, the NIST AHJ shall be consulted.

(12) Other Safety Systems

(a) Chemical fume hoods, chemical fume hood exhaust systems, and laboratory special exhaust systems shall be inspected, tested, and maintained in accordance with NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*, and *NIST S 7101.60, Chemical Management*.

(b) The NIST AHJ shall be consulted for initial acceptance testing/commissioning requirements for these systems.

c. Fire Protection and Life Safety System Impairments

(1) Impairment of any fire or life safety system shall comply with the requirements set forth in NIST S 7401.03: *Impairment of Fire Protection and Life Safety Systems.*

d. Performance of Inspection, Testing, and Maintenance

(1) Inspection, testing, and maintenance of fire protection and life safety systems shall be performed by an individual that meets the requirements set forth in the system-specific codes and standards referenced in Section 6b.

e. Recordkeeping

(1) ITM records shall be maintained per the requirements established within the relevant system-specific codes or for a minimum of two (2) years from the date of ITM completion where not specified within the code.

(2) ITM records shall be readily available for review by the NIST AHJ upon request.

7. DEFINITIONS

a. Acceptance Testing – Testing performed on an installation to confirm compliance with applicable manufacturers' installation specifications, applicable codes and standards, and the project Basis of Design and Owner's Project Requirements (NFPA *Glossary of Terms*).

b. Alcove – A recessed space within a corridor that is of sufficient size to be used for the storage of materials.

c. Authority Having Jurisdiction (AHJ) – A qualified Fire Protection Engineer[7] in Office of Safety Health and Environment designated by the NIST Chief Safety Officer to enforce[8] the NIST-adopted codes and standards relevant to fire, electrical, and life safety on NIST-owned and operated sites.

d. Combustible Material - A material that, in the form in which it is used and under the conditions anticipated, will ignite and burn; a material that does not meet the definition of noncombustible or limited-combustible.

e. Commissioning – A systematic process that provides documented confirmation that fire protection and life safety systems function according to the intended design criteria set forth in the project documents and satisfy the owner's operational needs, including compliance with any applicable laws, regulations, codes, and standards requiring fire protection and life safety systems (NFPA *Glossary of Terms*).

f. Commissioning Record – The complete set of commissioning documentation for a project that is turned over to the owner at the end of the construction phase.

g. Compartmentation – The interposing of a physical barrier that is not required to be fire or explosion resistant to limit combustible particulate solid migration and hence to control the size of a hazard area (NFPA *Glossary of Terms*).

h. Compliance – Meeting or exceeding all applicable requirements of the NIST adopted code(s) and standard(s).

i. Corridor - An enclosed *exit access* component that defines and provides a path of egress travel.

j. Delegated Authority Having Jurisdiction – A qualified engineer in Office of Safety Health and Environment designated by the NIST AHJ to enforce the NIST-adopted codes and standards that fall within their relevant discipline(s).

k. Emergency Power System – A system designed to provide secondary power to fire protection and life safety systems.

l. Exit Access – That portion of a *means of egress* system that leads from any occupied portion of a building or structure to an exit.

m. Fire Alarm System – A system or portion of a combination system that consists of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals (NFPA *Glossary of Terms*).

[7] See requirements for Office of Personnel Management Fire Protection Engineering Series 0804.
[8] Nature of enforcement is dependent upon the severity of the violation, e.g. stop work order, revocation of work permit, denial of use and occupancy.

n. Fire and Life Safety – The protection of life and property by minimizing fire and related hazards through the incorporation of and maintenance of building features, fire protection systems, and egress components, and the implementation of safe work practices.

o. Fire Protection System – Any fire alarm device or system or fire-extinguishing device or system, or combination thereof, that is designed and installed for detecting, controlling, or extinguishing a fire or otherwise alerting occupants, or the fire department, or both, that a fire has occurred.

p. Fixed Fire Suppression System – A total flooding or local application system consisting of a fixed supply of extinguishing agent permanently connected for fixed agent distribution to fixed nozzles that are arranged to discharge an extinguishing agent into an enclosure (total flooding), directly onto a hazard (local application), or a combination of both; or an automatic sprinkler system (NFPA *Glossary of Terms*).

q. Impairment – Temporary shutdown (in whole or in part) of a Fire Protection System where the system is damaged, disabled, or out of order. The resulting condition is that the Fire Protection System does not function as intended in the event of a fire or other emergency.

r. Inspection – A visual examination of a system or portion thereof to verify that it appears to be in operating condition and is free of physical damage (NFPA *Glossary of Terms*).

s. Life Safety Systems – Those systems that enhance or facilitate evacuation, smoke control, compartmentalization, and/or isolation.

t. Local (Non-Monitored) Systems – Fire protection and life safety systems that, when a change of state occurs, result in an audible and/or visual alarm at the device only; the change of state is not monitored at a supervised central station.

u. Monitored Systems – Fire protection and life safety systems connected to the NIST fire alarm system that, when a change of state occurs, result in a trouble, supervisory, and/or alarm signal at a supervised central station.

v. Means of Egress – A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge (NFPA *Glossary of Terms*).

w. Noncombustible Material- A material that complies with any of the following shall be considered a noncombustible material:

(1) A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat

(2) A material that is reported as passing ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C, or

(3) A material that is reported as complying with the pass/fail criteria of ASTM E 136 when tested in accordance with the test method and procedure in ASTM E 2652, Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C.

x. Pre-Functional Testing – Testing performed prior to acceptance testing to confirm compliance with manufacturers' specifications, applicable codes and standards, and the project documents (NFPA *Glossary of Terms*).

y. Private Fire Service Main – Private fire service main is that pipe and its appurtenances on private property:

(1) Between a source of water and the base of the system riser for water-based fire protection systems;

(2) Between a source of water and inlets to foam-making systems;

(3) Between a source of water and the base elbow of private hydrants or monitor nozzles;

(4) Used as fire pump suction and discharge piping; or

(5) Beginning at the inlet side of the check valve on a gravity or pressure tank (NFPA *Glossary of Terms*).

z. Shall/Should/May –

- Shall (Must or Will): Indicates that the performance of an item is mandatory.

- Should: Indicates that the performance of an item is not mandatory, but the full implications of not performing that item must be understood and either justified or carefully weighed before choosing a different course.

- May: Indicates that the performance of an item is at the discretion of the individual responsible for the action.

aa. Testing – A procedure used to determine the operational status of a component or system by conducting periodic physical checks, such as water flow tests, fire pump tests, alarm tests, and trip tests of dry pipe, deluge, or pre-action valves (NFPA *Glossary of Terms*).

bb. Underwriters Laboratories (UL) - Independent, non-profit product safety testing and certification organization

8. ACRONYMS

a. AHJ – Authority Having Jurisdiction

b. BSHED –Boulder Safety Health and Environment Division

c. FFSG – Fire and Facilities Safety Group

d. GSHED – Gaithersburg Safety Health and Environment Division

e. ITM – Inspection, Testing, and Maintenance

f. NFPA – National Fire Protection Association

g. OFPM – Office of Facilities and Property Management

h. OSHE – Office of Safety Health and Environment

i. UL- Underwriters Laboratories

9. RESPONSIBILITIES

a. Organizational Unit (OU) Directors are responsible for:

(1) Ensuring that the *Inspection, Testing, and Maintenance of Fire Protection and Life Safety Systems Suborder* is adapted and used in their spaces; and

(2) Ensuring that any fire protection and life safety systems owned by the OU are inspected, tested, and maintained in accordance with Section 6.

(3) Ensuring that individuals performing the inspection, testing, and maintenance of any fire protection and life safety systems owned by the OU are qualified per the requirements set forth in the system-specific codes and standards referenced in Section 6.

(4) Ensuring that all ITM records for any fire protection and life safety systems owned by the OU are maintained per the requirements of Section 6d.

b. First-Level Supervisors

(1) Ensuring that the employees and covered associates they supervise comply with the corridor storage requirements outlined in Section 6.

c. Chief Facilities Management Officer is responsible for:

(1) Ensuring that fire protection and life safety systems owned by NIST are inspected, tested, and maintained in accordance with Section 6;

(2) Ensuring that individuals performing the inspection, testing, and maintenance of fire protection and life safety systems owned by NIST are qualified per the requirements set forth in the system-specific codes and standards referenced in Section 6.

(3) Ensuring that new and modified fire protection and life safety systems owned by NIST undergo:

(a) Pre-functional testing; and

(b) Acceptance testing and commissioning;

(4) Ensuring that acceptance and commissioning records are:

(a) Received from the commissioning agent;

(b) Provided to the NIST AHJ in electronic or hard copy form; and

(c) Maintained by OFPM for the life of the system; and

(5) Ensuring that all ITM records for fire protection and life safety systems owned by NIST are maintained per the requirements of Section 6e.

d. NIST-Gaithersburg Fire Protection Group (*i.e.*, NIST Fire Department) is responsible for (Gaithersburg only):

(1) Ensuring that handheld fire extinguishers are inspected, tested, and maintained in accordance with the requirements of this suborder;

(a) Ensuring that all extinguishers are barcoded to allow for tracking of annual maintenance requirements; and

(2) Ensuring that all ITM records are maintained per the requirements of Section 6e.

e. NIST AHJ is responsible for:

(1) Ensuring that the requirements of this suborder are enforced;

(2) Providing additional guidance and interpretation of the provisions within this suborder and applicable codes.

(3) Witnessing acceptance testing of all new and modified fire protection and life safety systems; and

(4) Annually auditing ITM records to ensure that program requirements are being met and records are being appropriately maintained.

f. OSHE BSHED and GSHED Division Chiefs are responsible for:

(1) Assigning corridor inspection responsibilities to OSHE staff who meet the requirments of OU Workplace Inspectors.

(2) Ensuring that building corridors are inspected in accordance with Section 6b.

g. OSHE Staff Who Meet the Requirements of OU Workplace Inspectors are responsible for:

(1) Conducting semi-annual inspections of building corridors.

(2) Advising each OU of conditions requiring corrective action; and

(3) Immediately notifying the appropriate OU personnel to bring about the removal of items that would prevent safe egress of building occupants.

10. AUTHORITIES

a. The NIST AHJ may delegate the authority to carry out any AHJ responsibilities to Fire Protection Engineers in the Office of Safety, Health, and Environment.

b. If a fire protection and life safety is owned by an OU, the OU is ultimately responsible for ITM of the system(s). However, the OU may transfer the responsibilities for conducting ITM or managing a contract for ITM to another entity, such as OFPM or OSHE, provided this agreement is formalized in writing and a copy of this agreement is provided to the NIST AHJ.

c. As overseer of fire protection and life safety systems owned by NIST, OFPM is ultimately responsible for ITM of those systems. However, OFPM may transfer a portion of these responsibilities to another entity, such as the NIST-Gaithersburg Fire Protection Group (*i.e.*, NIST Fire Department) or OSHE, provided this agreement is formalized in writing and a copy of this agreement is provided to the NIST AHJ.

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11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

A. Revision History

Appendix A. Revision History

Version No.	Approval Date	Effective Date	Brief Description of Change; Rationale
1	03/28/18	04/01/19	• None – Initial document
2	04/22/21	TBD	• Removed references to specific code edition years in order to align with the F&LS Order • Removed classifications of building systems and research-specific systems; • Added NIST specific requirements for fire alarm acceptance testing; • Added requirements for maintaining safe egress corridors; • Added requirements for firestopping and fire-resistance systems; • Assigned corridor inspection responsibilities to OSHE; • Revised required inspection frequencies to align with the demands, resources, and infrastructure of NIST facilities.
3	07/21/23	TBD	• Section 9.d and Section 10.c – "NIST Fire Department" was added to clarify who the "NIST Fire Protection Group" is.

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955 Appendix B. ITM Requirements Extracted from NIST Adopted Codes and Standards
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Fire Alarm Systems			
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. All equipment	Annual	Inspection	NFPA 72- Chapter 14
2. Control equipment			NFPA 72- Chapter 14
(a) Fire alarm systems monitored for alarm, supervisory, and trouble signals			
(1) Functions	Annual	Test	
(2) Fuses	Annual	Inspection/Test	
(3) Interfaced Equipment	Annual	Inspection/Test	
(4) Lamps and LEDs	Annual	Inspection/Test	
(5) Primary (main) power supply	Annual	Inspection/Test	
(6) Trouble Signals	Semiannual	Inspection	
i. Audible and visual	Annual	Test	
ii. Disconnect switches	Annual	Test	
iii. Ground-fault monitoring circuit	Annual	Test	
iv. Transmission of signals to off-premises location	Annual	Test	
(b) Fire alarm systems unmonitored for alarm, supervisory, and trouble signals			
(1) Function	Annual	Test	
(2) Fuses	Annual	Test	
(3) Interfaced Equipment	Annual	Test	
(4) Lamps and LEDs	Annual	Test	
(5) Primary (main) power supply	Annual	Test	
(6) Trouble Signals	Annual	Test	
3. Supervising station alarm systems-transmitters			NFPA 72- Chapter 14
(a) All equipment	Annual	Inspection/Test	
(b) Digital alarm communicator transmitter (DACT)	Annual	Inspection/Test	
(c) Digital alarm radio transmitter (DART)	Annual	Inspection/Test	
(d) McCulloh transmitter	Annual	Inspection/Test	
(e) Radio alarm transmitter (RAT)	Annual	Inspection/Test	
(f) All other types of communicators	Annual	Inspection/Test	
4. In-building fire emergency voice/alarm communications equipment	Annual	Inspection	NFPA 72- Chapter 14
(a) Amplifier/tone generators	Annual	Test	
(b) Call-in signal silence	Annual	Test	
(c) Off-hook indicator (ring down)	Annual	Test	
(d) Phone jacks	Annual	Test	
(e) Phone set	Annual	Test	
(f) System performance	Annual	Test	
5. Engine-driven generator	Annual	Test	NFPA 72-Chapter 14
6. Secondary (standby) power supply	Annual	Test	NFPA 72-Chapter 14
7. Uninterruptible power supply (UPS)	Annual	Test	NFPA 72-Chapter 14
8. Batteries			NFPA 72-Chapter 14
(a) Lead-acid	Annual	Inspection	
(1) Battery replacement	Annual	Test	
(2) Charger test	Annual	Test	

(3) Discharge test	Annual	Test	
(4) Load voltage test	Annual	Test	
(5) Specific gravity	Annual	Test	
(b) Nickel-cadmium	Annual	Inspection	
(1) Battery replacement	Annual	Test	
(2) Charger test	Annual	Test	
(3) Discharge test	Annual	Test	
(4) Load voltage test	Annual	Test	
(c) Primary (dry cell)	Annual	Inspection	
(d) Sealed lead-acid	Annual	Inspection	
(1) Battery replacement	Annual	Test	
(2) Charger test	Annual	Test	
(3) Discharge test	Annual	Test	
(4) Load voltage test	Annual	Test	
9. Public emergency alarm reporting system-wired system	Daily	Test	NFPA 72- Chapter 14
10. Remote annunciators	Annual	Inspection/Test	NFPA 72- Chapter 14
11. Notification appliance circuit power extenders	Annual	Inspection	NFPA 72- Chapter 14
12. Remote power supplies	Annual	Inspection	NFPA 72- Chapter 14
13. Transient suppressors	Annual	Inspection	NFPA 72- Chapter 14
14. Fiber-optic cable connections	Annual	Inspection	NFPA 72- Chapter 14
15. Conductors circuit integrity	Annual	Test	NFPA 72- Chapter 14
16. Initiating Devices			NFPA 72- Chapter 14
(a) Air sampling	Annual	Inspection/Test	
(b) Duct Detectors	Annual	Inspection/Test	
(c) Electromechanical releasing devices	Annual	Inspection/Test	
(d) Fire extinguishing system(s) or suppression system(s) switches	Annual	Inspection/Test	
(e) Manual fire alarm boxes	Annual	Inspection/Test	
(f) Heat detectors	Annual	Inspection/Test	
(g) Radiant energy fire detectors	Annual	Inspection/Test	
(h) Video image smoke and fire detectors	Annual	Inspection/Test	
(i) Smoke detectors	Annual	Inspection/Test	
(1) Sensitivity testing	5 years	Test	
(j) Projected beam smoke detectors	Annual	Inspection/Test	
(k) Supervisory signal devices	Annual	Inspection/Test	
(l) Waterflow devices	Quarterly Semiannual	Inspection Test	
(m) Carbon monoxide detectors	Annual	Inspection/Test	
(n) Multi-sensor fire detector or multi-criteria fire detector or combination fire detector	Annual	Test	
(o) Fire-gas and other detectors	Annual	Test	
17. Special hazard equipment			NFPA 72- Chapter 14
(a) Abort switch	Annual	Test	
(b) Cross-zone detection circuit	Annual	Test	
(c) Matrix-type circuit	Annual	Test	
(d) Release solenoid circuit	Annual	Test	
(e) Squibb release circuit	Annual	Test	
(f) Verified, sequential, or counting zone circuit	Annual	Test	
(g) All above devices or circuits or combinations thereof	Annual	Test	
18. Combination Systems			NFPA 72- Chapter 14
(h) Fire extinguisher electronic monitoring device/systems	Annual	Inspection/Test	

(i) Carbon monoxide detectors/systems	Annual	Inspection/Test	
19. Fire alarm control interface and emergency control function interface	Semiannual Frequency required by the applicable NFPA standard(s) for the equipment being supervised.	Inspection Test	NFPA 72- Chapter 14
20. Notification appliances			NFPA 72- Chapter 14
(a) Audible appliances	Annual	Inspection/Test	
(b) Audible textual notification appliances	Annual	Inspection/Test	
(c) Visible appliances	Annual	Inspection/Test	
21. Exit marking audible notification appliances	Annual	Inspection/Test	NFPA 72- Chapter 14
22. Emergency control functions	Annual	Test	NFPA 72- Chapter 14
23. Area of refuge two-way communication system	Annual	Inspection/Test	NFPA 72- Chapter 14
24. Special Procedures			NFPA 72- Chapter 14
(a) Alarm verification	Annual	Test	
(b) Multiplex systems	Annual	Test	
25. Supervising station alarm systems-receivers			NFPA 72- Chapter 14
(a) All equipment	Monthly	Test	
(b) Signal receipt	Daily	Inspection	
(c) Receivers	Annual	Inspection	
26. Public emergency alarm reporting system transmission equipment			NFPA 72- Chapter 14
(a) Publicly accessible alarm box	Annual	Inspection/Test	
(b) Auxiliary box	Annual	Inspection/Test	
(c) Master box			
(1) Manual operation	Annual	Inspection/Test	
(2) Auxiliary operation	Annual	Inspection/Test	
27. Mass notification system			NFPA 72- Chapter 14
(a) Functions	Annual	Test	
(b) Monitored for integrity			
(1) Control Equipment			
i. Fuses	Annual	Inspection/Test	
ii. Interfaces	Annual	Inspection/Test	
iii. Lamps/LED	Annual	Inspection/Test	
iv. Primary (main) power supply	Annual	Inspection/Test	
(2) Secondary power	Annual	Inspection/Test	
(3) Initiating devices	Annual	Inspection	
(4) Notification appliances	Annual	Inspection/Test	
(b) Not monitored for integrity; installed prior to adoption of 2010 edition			
(1) Control equipment			
i. Fuses	Annual	Inspection/Test	
ii. Interfaces	Annual	Inspection/Test	
iii. Lamps/LED	Annual	Inspection/Test	
iv. Primary (main) power supply	Annual	Inspection/Test	
(2) Secondary power	Annual	Inspection/Test	
(3) Initiating devices	Annual	Inspection	
(4) Notification appliances	Annual	Inspection/Test	
(c) Control unit functions and no diagnostic failures are indicated	Annual	Test	
(d) Control unit reset	Annual	Test	
(e) Control unit security	Annual	Test	
(f) Audible/visible functional test	Annual	Test	
(g) Software backup	Annual	Test	

(h) Wireless signals	Annual	Test	
(i) Antenna	Annual	Inspection/Test	
(j) Transceivers	Annual	Inspection/Test	

Sprinkler Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Gauges			NFPA 25- Chapter 5
(a) Wet system gauges	Quarterly 5 years	Inspection Test	
(b) Deluge system gauges	Quarterly 5 years	Inspection Test	
(c) Dry system gauges			
(1) Gauges where air pressure supervision is connected to a constantly attended location	Quarterly 5 years	Inspection Test	
(d) Preaction system gauges	Quarterly 5 years	Inspection Test	
2. Waterflow alarm devices			NFPA 25- Chapter 5
(a) Mechanical devices	Quarterly	Inspection/Test	
(b) Vane and pressure-switch-type devices	Quarterly Semiannual	Inspection Test	
3. Hydraulic name plate	Quarterly	Inspection	NFPA 25- Chapter 5
4. Buildings	Annual (prior to freezing weather)	Inspection	NFPA 25- Chapter 4
5. Hanger/seismic bracing	Annual	Inspection	NFPA 25- Chapter 5
6. Pipe and fittings	Annual	Inspection	NFPA 25- Chapter 5
7. Sprinklers			NFPA 25- Chapter 5
(a) All	Annual At 50 years and every 10 years thereafter At 75 years and every 5 years thereafter	Inspection Test Test	
(b) Extra-high or greater temperature solder type	5 years	Test	
(c) Fast-response	At 20 years and every 10 years thereafter	Test	
(d) Dry	At 10 years and every 10 years thereafter		
(e) In harsh environments	5 years	Test	
8. Sprinklers and automatic spray nozzles protecting commercial cooking equipment and ventilation systems	Annual	Test	NFPA 25- Chapter 5
9. Spare sprinklers	Annual	Inspection	NFPA 25- Chapter 5
10. Information sign	Annual	Inspection	NFPA 25- Chapter 5
11. Obstruction, internal inspection of piping	5 years	Inspection	NFPA 25- Chapter 14
12. Heat trace	Per manufacturer requirements	Inspection	NFPA 25- Chapter 5
13. Antifreeze solution	Annual	Maintenance	NFPA 25- Chapter 5

Standpipe and Hose Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Piping	Annual	Inspection	NFPA 25- Chapter 6
2. Cabinet	Annual	Inspection	NFPA 1962
3. Gauges			NFPA 25- Chapter 6
(a) Automatic wet system gauges	Quarterly	Inspection	

(b) Semiautomatic dry system gauges	Quarterly	Inspection	NFPA 25- Chapter 6
(c) Automatic dry system gauges	Quarterly	Inspection	NFPA 25- Chapter 6
(d) Gauges where air pressure supervision is connected to a constantly attended location	Quarterly	Inspection	NFPA 25- Chapter 6
4. Hose	Annual At 5 years and every 3 years thereafter	Inspection Test	NFPA 1962
5. Hose storage device	Annual	Inspection/Test	NFPA 1962
6. Hose nozzle	Annual and after each use	Inspection	NFPA 1962
7. Hydraulic design information sign	Annual	Inspection	NFPA 25- Chapter 6
8. Hydrostatic test	5 years	Test	NFPA 25- Chapter 6
9. Flow test	5 years	Test	NFPA 25- Chapter 6

Private Fire Service Mains

Component	Periodic Frequency	Method	NFPA Reference
1. Hose houses	Quarterly Annual	Inspection Maintenance	NFPA 25- Chapter 7
2. Hydrants	Annual	Flow test, Inspection, and maintenance	NFPA 25- Chapter 7
3. Monitor nozzles	Semiannual Annual	Inspection Flow test and maintenance	NFPA 25- Chapter 7
4. Mainline strainers	Annual	Inspection and maintenance	NFPA 25- Chapter 7
5. Piping (a) Exposed (b) Underground	 Annual 5 years 5 years	 Inspection Flow test Flow test	NFPA 25- Chapter 7

Fire Pumps

Component	Periodic Frequency	Method	NFPA Reference
1. Pump operation			NFPA 25- Chapter 8
(a) No-flow condition			
i. Diesel engine-driven fire pump	Annual	Test	
ii. Electric motor-driven fire pump			
1. Fire pumps serving high rise buildings	Annual	Test	
2. Fire pumps with limited service controllers	Annual	Test	
3. Vertical turbine fire pumps	Annual	Test	
4. Fire pumps taking suction from ground level tanks or a water source that does not provide sufficient pressure to be of material value without the pump	Annual	Test	
5. All other fire pumps	Annual	Test	
(b) Flow condition	Annual	Test	
(c) Fire pump alarm signals	Annual	Test	
2. Hydraulic	Annual	Maintenance	NFPA 25- Chapter 8
3. Mechanical transmission	Annual	Maintenance	NFPA 25- Chapter 8
4. Motor	Annual	Maintenance	NFPA 25- Chapter 8
5. Controller, various components	Per manufacturer recommendations	Maintenance	NFPA 25- Chapter 8
6. Diesel engine system, various components	Per manufacturer recommendations	Maintenance	NFPA 25- Chapter 8

Water Spray Fixed Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Drainage	Annual	Inspection	NFPA 25- Chapter 10
2. Fittings	Annual	Inspection	NFPA 25- Chapter 10

3. Hangers	Annual	Inspection	NFPA 25- Chapter 10
4. Nozzles	Annual	Inspection/Test	NFPA 25- Chapter 10
5. Pipe	Annual	Inspection/Test	NFPA 25- Chapter 10
6. Strainers (a) Baskets/screens	Per manufacturer recommendations Annual 5 years	Inspection Test and maintenance Maintenance	NFPA 25- Chapter 10
7. Supports	Annual	Inspection	NFPA 25- Chapter 10
8. UHSWSS (a) Detectors (b) Controllers (c) Valves	 Annual Annual Annual	 Inspection/Test Inspection/Test Inspection/Test	NFPA 25- Chapter 10
9. Flushing	Annual	Test	NFPA 25- Chapter 10
10. Water spray system	Annual	Test and maintenance	NFPA 25- Chapter 10

Foam-Water Sprinkler Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Discharge device location (a) Sprinkler (b) Spray Nozzle	 Annual Annual	 Inspection/Test Inspection/Test	NFPA 25- Chapter 11
2. Discharge device position (a) Sprinkler (b) Spray Nozzle	 Annual Annual	 Inspection/Test Inspection/Test	NFPA 25- Chapter 11
3. Discharge device obstruction	Annual	Test	NFPA 25- Chapter 11
4. Foam concentrate pump operation	Monthly	Maintenance	NFPA 25- Chapter 11
5. Foam concentrate strainer	Quarterly Annual	Inspection and maintenance Test	NFPA 25- Chapter 11
6. Foam concentrate samples	Annual	Maintenance	NFPA 25- Chapter 11
7. Drainage in system area	Quarterly	Inspection	NFPA 25- Chapter 11
8. Proportioning system (a) Standard pressure type i. Ball drip (automatic type) drain valves ii. Foam concentrate tank-drain and flush iii. Corrosion and hydrostatic test (b) Bladder tank type i. Sight glass ii. Foam concentrate tank- hydrostatic test (c) Line type i. Foam concentrate tank-corrosion and pickup pipes ii. Foam concentrate tank- drain and flush (d) Standard balanced pressure type i. Foam concentrate pump ii. Balancing valve diaphragm iii. Foam concentrate tank (e) In-line balanced pressure type i. Foam concentrate pump ii. Balancing valve diaphragm iii. Foam concentrate tank	Monthly Annual 5 years 10 years 10 years 10 years 10 years 10 years 10 years 5 years 5 years 10 years 5 years 5 years 10 years	Inspection Test Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance	NFPA 25- Chapter 11
9. Complete foam-water system	Annual	Test	NFPA 25- Chapter 11
10. Foam-water solution	Annual	Test	NFPA 25- Chapter 11
11. Manual actuation device	Annual	Test	NFPA 25- Chapter 11
12. Pipe corrosion	Annual	Inspection	NFPA 25- Chapter 11
13. Pipe damage	Annual	Inspection	NFPA 25- Chapter 11
14. Fittings corrosion	Annual	Inspection	NFPA 25- Chapter 11
15. Fittings damage	Annual	Inspection	NFPA 25- Chapter 11

16. Hangers/supports	Annual	Inspection	NFPA 25- Chapter 11
17. Waterflow devices			NFPA 25- Chapter 11
(a) Mechanical devices	Quarterly	Inspection/Test	
(b) Vane-type and pressure switch-type	Quarterly Semiannually	Inspection Test	NFPA 25- Chapter 11
11. Strainers-mainline	Per manufacturer recommendations	Inspection	NFPA 25- Chapter 11
12. Pressure vacuum vents	5 years	Maintenance	NFPA 25- Chapter 11

Water Mist Systems

Component	Periodic Frequency	Method	NFPA Reference
1. System flush	Annual	Maintenance	NFPA 25- Chapter 12
2. Water supply (general)	Quarterly Annual	Inspection Test	NFPA 25- Chapter 12
3. Water storage tanks			NFPA 25- Chapter 12
(a) Water level-unsupervised	Monthly	Inspection	
(b) Water level-supervised	Quarterly	Inspection	
(c) Sight glass	Monthly	Inspection	
(d) Tank pressure gauges	Quarterly	Inspection	
(e) Valves, appurtenances	Semiannual	Inspection	
(f) Tank interior	Annually	Inspection and maintenance	
4. Water storage cylinder (high pressure)			NFPA 25- Chapter 12
(a) Water level-load cells	Semiannual	Inspection	
(b) Water level-unsupervised	Quarterly	Inspection	
(c) Support frame/restraints	Annual	Inspection	
(d) Vent plugs	Annual	Inspection	
(e) Cylinder pressure on discharge	Annual	Inspection	
(f) Filters on refill connection	Annual	Inspection	
5. Additive storage cylinders			NFPA 25- Chapter 12
(a) General condition	Quarterly	Inspection	
(b) Quantity of additive agent	Semiannual	Inspection	
(c) Quality of additive agent	Annual	Test	
(d) Additive injection, full discharge test	Annual	Test	
6. Water recirculation tank			NFPA 25- Chapter 12
(a) Water level-unsupervised	Monthly	Inspection	
(b) Water level-supervised	Quarterly	Inspection	
(c) Supports, attachments	Annual	Inspection	
(d) Low water level alarm	Annual	Test	
(e) Water quality, drain, flush, and refill	Annual	Inspection	
(f) Float-operated valve	Annual	Test	
(g) Pressure at outlet during discharge	Annual	Test	
(h) Backflow prevention device	Annual	Test	
(i) Filters, strainers, and cyclone separator	Annual	Inspection and maintenance	
7. Compressed gas cylinders			NFPA 25- Chapter 12
(a) Support frame and cylinder restraints	Quarterly	Inspection	
(b) Cylinder pressure-unsupervised	Monthly	Inspection	
(c) Cylinder pressure-supervised	Quarterly	Inspection	
(d) Cylinder control valve	Monthly	Inspection	
(e) Cylinder capacity and pressure rating	Annual	Inspection	
(f) Cylinder compliance specification	Annual	Inspection	
(g) Compressed gas specifications	Annual	Test	
(h) Hydrostatic test	5-12 years	Test	

8. Plant air, compressors, and receivers			NFPA 25- Chapter 12
(a) Air pressure-unsupervised	Weekly	Inspection	
(b) Air pressure-supervised	Monthly	Inspection	
(c) Compressor	Weekly	Test	
(d) Compressor/receiver capacity, changes	Semiannual	Test	
(e) Compressed air moisture content	Annual	Test	
(f) Filter, moisture traps	Semiannual	Maintenance	
(g) Full capacity, duration, and any changes in other demands	Annual	Test	
9. Standby pump			NFPA 25- Chapter 12
(a) Moisture trap, oil injection (pneumatic)	Monthly	Inspection and maintenance	
(b) Compressed gas supply, inlet air pressure	Monthly	Inspection	
(c) Outlet water (standby) pressure	Monthly	Inspection	
(d) Start/stop pressure settings for standby pressure	Quarterly	Test	
10. Pneumatic valves			NFPA 25- Chapter 12
(a) Cylinder valves, master release valves	Monthly	Inspection	
(b) All tubing associated with release valves	Quarterly	Inspection	
(c) Solenoid release of master release valve	Semiannual	Test	
(d) Manual release of master release valve	Annual	Test	
(e) Operation of slave valves	Annual	Test	
(f) All pneumatic cylinder release valves	Annual	Maintenance	
(g) On-off cycling of valves intended to cycle	Annual	Test	
11. Enclosure features, interlocks	Semiannual	Test	NFPA 25- Chapter 12
12. Ventilation			NFPA 25- Chapter 12
(a) Interlocked systems (e.g., ventilation shutdown)	Annual	Test	
(b) Shutdown of fuel/lubrication systems	Annual	Test	

Valves, Valve Components, and Trim

Component	Periodic Frequency	Method	NFPA Reference
1. Control valves			NFPA 25- Chapter 13
(a) All control valves	Annual	Maintenance	
i. Position	Annual	Test	
ii. Operation	Annual	Test	
iii. Supervisory	Semiannual	Test	
2. Valve supervisory signal initiating device	Quarterly	Inspection	NFPA 25- Chapter 13
3. Alarm valves			NFPA 25- Chapter 13
(a) Exterior of valve	Annual	Inspection	
(b) Interior of valve	5 years	Inspection	
(c) Strainers, filters, orifices	5 years	Inspection	
4. Check valves- interior	5 years	Inspection	NFPA 25- Chapter 13
5. Preaction/Deluge valves	Annual	Maintenance	NFPA 25- Chapter 13
(a) Exterior of valve	Quarterly	Inspection	
(b) Interior of valve			
i. Valves that cannot be reset without removal of a faceplate	Annual	Inspection	
ii. Valves that can be reset without removal of a faceplate	5 years	Inspection	
(c) Strainers, filters, orifices	5 years	Inspection	
(d) Priming water	Quarterly	Test	
(e) Low air pressure alarms			
i. Not installed in valve enclosures	Quarterly	Test	
ii. Installed in valve enclosures	Annual	Test	
(f) Full flow	Annual	Test	

(g) Air leakage	3 years	Test	
6. Dry pipe valves/quick-opening devices	Annual	Maintenance	NFPA 25- Chapter 13
(a) Gauges			
i. Gauges on systems with low air or nitrogen pressure alarm	Quaterly	Inspection	
(b) Exterior of valve	Annual	Inspection	
(c) Interior of valve	Annual	Inspection	
(d) Strainers, filters, orifices	5 years	Inspection	
(e) Air leakage	3 years	Test	
(f) Priming water	Quarterly	Test	
(g) Low air pressure alarm	Quarterly	Test	
(h) Quick-opening devices	Quarterly	Test	
(i) Trip test	Annual	Test	
(j) Full flow trip test	3 years	Test	
7. Pressure-reducing and relief valves			NFPA 25- Chapter 13
(a) Sprinkler systems	Quarterly 5 years	Inspection Test	
(b) Hose connections	Annual 5 years	Inspection Test	
(c) Hose racks	Annual 5years	Inspection Test	
(d) Fire pumps			
i. Casing relief valves	Annual	Inspection	
ii. Pressure-relief valves	Annual	Inspection	
(e) Pressure relief valves	Annual	Test	
(f) Circulation relief	Annual	Test	
8. Backflow prevention assemblies	Annual	Test	NFPA 25- Chapter 13
(a) Isolation valves	Annual	Inspection	
(b) Valves secured with locks or electrically supervised	Annual	Inspection	
(c) RPAs and RDAs	Annual	Inspection	
(d) Interior of assembly	5 years	Inspection	
9. Fire department connections	Quarterly	Inspection	NFPA 25- Chapter 13
10. Main drains			NFPA 25- Chapter 13
(a) Systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves	Quarterly	Test	
(b) All other systems	Annual	Test	
11. Gauges	5 years	Test	NFPA 25- Chapter 13
12. Waterflow devices			NFPA 25- Chapter 13
(a) Mechanical devices	Quarterly	Test	
(b) Vane-type and pressure switch-type	Semiannually	Test	NFPA 25- Chapter 13

Carbon Dioxide Extinguishing Systems

Component	Periodic Frequency	Method	NFPA Reference
1. All system components	Monthly Per manufacturer recommendations	Inspection Test and maintenance	NFPA 12- Chapter 4
2. Hose	5 years	Inspection/Test	NFPA 12- Chapter 4
3. Carbon dioxide system	Annual	Inspection/Test	NFPA 12- Chapter 4
4. Size, type, and configuration of the hazard and system	Annual	Inspection/Test	NFPA 12- Chapter 4
5. Time delays for operation	Annual	Inspection/Test	NFPA 12- Chapter 4
6. Audible alarms for operation	Annual	Inspection/Test	NFPA 12- Chapter 4
7. Visible alarms for operation	Annual	Inspection/Test	NFPA 12- Chapter 4
8. Warning signs	Annual	Inspection	NFPA 12- Chapter 4

9. High pressure cylinder weights	Semiannual	Inspection	NFPA 12- Chapter 4
Dry Chemical Extinguishing Systems			
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System	Annual	Inspection/Maintenance	NFPA 17- Chapter 11
2. Dry chemical in stored pressure systems	6 years	Maintenance	NFPA 17- Chapter 11
3. Pressure regulators	Annual	Test	NFPA 17- Chapter 11
4. Auxiliary pressure cylinders	Annual 12 years	Inspection Test-Hydrostatic	NFPA 17- Chapter 11
5. Fixed temperature sensing element- fusible metal alloy type	Annual	Maintenance	NFPA 17- Chapter 11
6. Dry chemical containers	12 years	Test-Hydrostatic	NFPA 17- Chapter 11
7. Hose assemblies	12 years	Test-Hydrostatic	NFPA 17- Chapter 11
Wet Chemical Extinguishing Systems			
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System	Annual	Inspection Maintenance	NFPA 17A- Chapter 7
2. Fixed temperature sensing element- fusible metal alloy type	Annual	Maintenance	NFPA 17A- Chapter 7
3. Wet chemical containers	12 years	Test-Hydrostatic	NFPA 17A- Chapter 7
4. Auxiliary pressure containers	12 years	Test-Hydrostatic	NFPA 17A- Chapter 7
5. Hose assemblies	12 years	Test-Hydrostatic	NFPA 17A- Chapter 7
Clean Agent Extinguishing Systems			
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. System	Annual	Inspection/Test	NFPA 2001- Chapter 7
2. Agent quantity and pressure	Annual	Inspection	NFPA 2001- Chapter 7
3. Pressure gauges	Annual	Inspection	NFPA 2001- Chapter 7
4. Factory-charges, nonrefillable containers that do not have a means of pressure indication	Annual	Inspection	NFPA 2001- Chapter 7
5. Clean agent cylinders	5 years	Inspection	NFPA 2001- Chapter 7
6. Hose	Annual 5 years	Inspection Test	NFPA 2001- Chapter 7
7. Enclosure	Annual	Inspection	NFPA 2001- Chapter 7
Handheld Fire Extinguishers			
Component	**Periodic Frequency**	**Method**	**NFPA Reference**
1. Fire extinguishers and Class D extinguishing agents	Annual	Inspection/External examination	NFPA 10- Chapter 7
2. Inside of fire extinguishers			NFPA 10- Chapter 7
(a) Stored-pressure loaded stream and antifreeze	Annual 5 years	Inspection-internal Test-Hydrostatic	
(b) Pump tank water and pump tank, calcium chloride based	Annual	Internal inspection and maintenance	
(c) Dry chemical, cartridge and cylinder operated, with mild steel shells	Annual	Inspection-internal	
(d) Dry powder, cartridge and cylinder operated, with mild steel shells	Annual	Inspection-internal	
(e) Wetting agent	Annual 5 years	Inspection-internal Test-Hydrostatic	
(f) Stored-pressure water	5 years	Inspection-internal	

(g) AFFF	3 years 3 years 5 years	Maintenance Inspection-internal Test-Hydrostatic	
(h) FFFP	3 years 3 years 5 years	Maintenance Inspection-internal Test-Hydrostatic	
(i) Stored-pressure dry chemical, with stainless steel shell	5 years	Internal inspection and hydrostatic test	
(j) Carbon dioxide	5 years	Internal inspection and hydrostatic test	
(k) Wet chemical	5 years	Internal inspection and hydrostatic test	
(l) Dry chemical stored-pressure, with mild steel shells, brazed brass shells, and aluminum shells	6 years 12 years	Inspection-internal Test-Hydrostatic	
(m) Halogenated agents	6 years 12 years	Inspection-internal Test-Hydrostatic	
(n) Dry powder, stored-pressure, with mild steel shells	6 years 12 years	Inspection-internal Test-Hydrostatic	
3. Stored-pressure type extinguishers containing a loaded stream agent	Annual	Maintenance	NFPA 10- Chapter 7
4. Wetting agent extinguishers	Annual	Maintenance	NFPA 10- Chapter 7
5. Nonrechargeable fire extinguishers	12 years	Removed from service	NFPA 10- Chapter 7
6. Carbon dioxide hose assembly	Annual	Test	NFPA 10- Chapter 7
7. Electronic monitoring device/system	Annual	Test and maintenance	NFPA 10- Chapter 7
(a) Units	5 years	Test	
8. Discharge hoses on wheeled-type fire extinguishers	Annual	Inspection	NFPA 10- Chapter 7
9. Pressure regulators on wheeled-type fire extinguishers	Annual	Test	NFPA 10- Chapter 7
10. Pressure gauges	Annual	Maintenance	NFPA 10- Chapter 7
11. Nitrogen cartridges, argon cartridges, carbon dioxide cartridges, or cartridges used for inert gas storage that are used as expellants for wheeled fire extinguishers and carbon dioxide extinguishers	5 years	Test-Hydrostatic	NFPA 10- Chapter 7

Fire Barriers

Component	Periodic Frequency	Method	NFPA Reference
1. Fire doors	Annual	Inspection/Test	NFPA 80- Chapter 5
2. Fire shutters	Annual	Inspection/Test	NFPA 80- Chapter 5
3. Fire windows	Annual	Inspection/Test	NFPA 80- Chapter 5
4. Opening protectives other than fire dampers and fabric fire safety curtains	Annual	Inspection/Test	NFPA 80- Chapter 5

Smoke Control Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Air-conditioning, heating, ventilating ductwork, and related equipment			NFPA 90A-Annex B
(a) Electrical equipment of automatic filters	Annual	Inspection and maintenance	
(b) Drive motors and gear reductions	Annual	Inspection and maintenance	
(c) Ducts	Annual	Inspection and maintenance	
(d) Apparatus casing and air-handling unit plenums	Annual	Inspection and maintenance	
(e) Ceiling cavity plenums, raised floor plenums, and duct distribution plenums	Annual	Inspection and maintenance	
(f) Fans and fan motors	Annual	Inspection and maintenance	
(g) Fan controls	Annual	Inspection/Test	
2. Smoke detection for automatic HVAC control			NFPA 90A-Chapter 6
(a) All automatic shutdown devices	Annual	Test	

3. Smoke dampers and combination fire and smoke dampers	1 year after installation and every 4 years thereafter	Inspection/Test	NFPA 80- Chapter 19
4. Smoke and heat venting systems			NFPA 204-Chapter 12
(a) Mechanically opened vents	Annual	Inspection/Test	
(b) Special mechanisms such as gas cylinders, thermal sensors, or detectors	Annual	Inspection/Test	
(c) Thermoplastic drop-out vents	Annual	Inspection	
(d) Inlet air sources	Annual	Inspection	
5. Mechanical smoke-exhaust systems	Annual	Inspection/Test	NFPA 204-Chapter 12

Emergency and Standby Power Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Emergency power supply systems- all appurtenant components	Monthly	Inspection/Test	NFPA 110-Chapter 8
2. Level 1 emergency power supply systems	Quarterly	Test	NFPA 110-Chapter 8
3. Diesel generator sets	Monthly	Test	NFPA 110-Chapter 8
4. Spark-ignited generator sets	Monthly	Test	NFPA 110-Chapter 8
5. Transfer switches	Monthly	Test	NFPA 110-Chapter 8
6. Circuit breakers for Level 1 system usage, including main and feed breakers between the emergency power system and the transfer switch load terminals	Annual	Test	NFPA 110-Chapter 8
7. Circuit breakers rated in excess of 600 volts for Level 1 system usage	Semiannual 2 years	Test Test-Simulated overload	NFPA 110-Chapter 8
8. Storage batteries	Monthly	Inspection	NFPA 110-Chapter 8
9. Lead-acid batteries	Monthly	Test and maintenance	NFPA 110-Chapter 8
10. Fuel quality	Annual	Test	NFPA 110-Chapter 8
11. Stored electrical energy emergency and standby power systems			NFPA 111-Chapter 8
(a) Battery			
i. Float voltage	Monthly	Inspection	
ii. Cable connection	Semiannual	Inspection	
iii. Terminals	Quarterly	Maintenance	
iv. Electrolyte gravity	Quarterly	Test	
v. Electrolyte level	Monthly	Inspection	
(b) Energy conversion equipment			
i. Power supply voltage	Monthly	Inspection	
ii. Terminals	Semiannual	Inspection	
iii. Panel meters	Monthly	Inspection	
iv. Panel lamps	Monthly	Inspection	
v. Circuit breakers, fuses	2 years	Inspection and maintenance	
(c) Battery charger			
i. Output terminal volts	Monthly	Inspection	
ii. Fuses	2 years	Inspection and maintenance	
iii. Charge current	Quarterly	Test and inspection	
iv. Equalize voltage	Quarterly	Inspection	
v. Panel meters	Monthly	Inspection	
vi. Panel lamps	Monthly	Inspection	
(d) Load			
i. Load current	Quarterly	Inspection	
ii. Panel meters	Monthly	Inspection	
(e) Transfer switch	Semiannual	Test	
i. Contacts	Annual	Inspection	
(f) Fuel cell			
i. System	Quarterly	Test and inspection	
ii. Fuel supply	Quarterly	Inspection	
iii. Piping	Annual	Inspection	
iv. Cooling system	Annual	Inspection	
v. Connectors	Annual	Maintenance	
vi. Fuel system pressure/leakage	Annual	Test	

vii. Full load test viii. Calibrate H_2 detector	Annual Annual	Test Maintenance	

Explosion Prevention and Control Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Vent closures	Annual	Inspection	NFPA 68-Chapter 11
2. Explosion prevention systems	Annual	Inspection/Test	NFPA 69-Chapter 15

Commercial Cooking Suppression Systems

Component	Periodic Frequency	Method	NFPA Reference
1. System	Semiannual	Maintenance	NFPA 96-Chapter 11
2. Fusible links- metal alloy type	Semiannual	Replace	NFPA 96-Chapter 11
3. Automatic sprinklers- metal alloy type	Semiannual	Replace	NFPA 96-Chapter 11
4. Detection devices that are bulb-type automatic sprinklers and fusible links	Annual	Inspection and maintenance	NFPA 96-Chapter 11
5. Fixed temperature-sensing elements other than the fusible metal alloy type	Annual	Inspection and maintenance	NFPA 96-Chapter 11
6. Grease buildup			NFPA 96-Chapter 11
(a) Systems serving solid fuel cooking operations	Monthly	Inspection and maintenance	
(b) Systems serving high-volume cooking operations	Quarterly	Inspection and maintenance	
(c) Systems serving moderate-volume cooking operations	Semiannual	Inspection and maintenance	
(d) Systems serving low-volume cooking operations	Annual	Inspection and maintenance	
7. Cooking equipment	Annual	Inspection and maintenance	NFPA 96-Chapter 11

Elevator Emergency Operation Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Electric elevators	Annual	Test- Category 1	ASME A17.1-Appendix N
2. Hydraulic elevators	Annual	Test- Category 1	ASME A17.1-Appendix N
3. Fire fighters' emergency operations	Monthly	Test	NFPA 101-Section 9.4

Means of Egress and Associated Systems

Component	Periodic Frequency	Method	NFPA Reference
1. Door leaves equipped with panic hardware got fire exit hardware	Annual	Test and inspection	NFPA 101-Chapter 7
2. Door assemblies in exit enclosures	Annual	Test and inspection	NFPA 101-Chapter 7
3. Electronically controlled egress doors	Annual	Test and inspection	NFPA 101-Chapter 7
4. Door assemblies with special locking arrangements	Annual	Test and inspection	NFPA 101-Chapter 7
5. Emergency lighting system	Monthly Annual	Test- 30 seconds Test- 1.5 hours	NFPA 101-Chapter 7
6. Exit signs	Monthly	Test and inspection	NFPA 101-Chapter 7

Monitored Life Safety Systems

Component	Periodic Frequency	Method	NFPA Reference
1. System	As specified in the commissioning plan	Test	NFPA 4-Chapter 15

Chemical Fume Hoods

Component	Periodic Frequency	Method	NFPA Reference
1. Chemical fume hoods	Annual	Inspection	NFPA 45-Chapter 7

2. Chemical fume hood exhaust system	Annual	Inspection	NFPA 45-Chapter 7
3. Laboratory special exhaust system	Annual	Inspection	NFPA 45-Chapter 7
4. Air system flow detectors	Annual	Inspection	NFPA 45-Chapter 7
5. Air supply and exhaust fans, motors, and components	Annual	Inspection	NFPA 45-Chapter 7
6. Fan belts where airflow detectors are not provided or airflow tests are not made	Quarterly	Inspection	NFPA 45-Chapter 7
(a) Double sheaves and belts	Semiannual	Inspection	
7. Fixed fire-extinguishing systems protecting filters	Quarterly	Inspection and maintenance	NFPA 45-Chapter 7

958
959