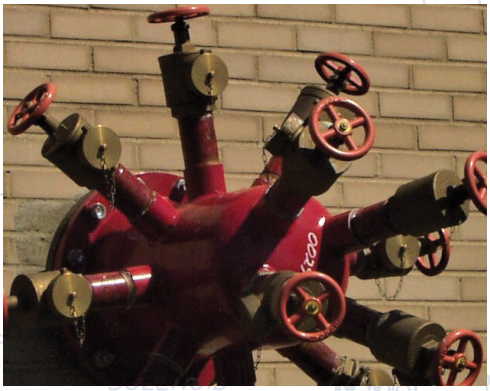

Inspection, Testing, and Maintenance Requirements for Fire Protection and Life Safety Systems

ENGINEERING DEPARTMENT | APRIL 2021

PORT AUTHORITY NY NJ 100 1921 2021

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I. INTRODUCTION

This Manual defines the requirements for inspection, testing, and maintenance for Fire Protection and Life Safety (FPLS) systems at all Port Authority of NY and NJ (PANYNJ) facilities. FPLS systems include but are not limited to fire sprinkler systems, fire detection systems, fire alarm systems, smoke management systems, emergency lighting systems, and fire rated doors.

FPLS systems provide protection of life and property for tenants, the general public, patrons, and employees throughout PANYNJ facilities. In compliance with building and fire code requirements, in the respective jurisdictions, all FPLS systems must be inspected, tested, and maintained to assure designed performance in emergencies.

The information provided in this Manual for inspection, testing, and maintenance is designed to conform with national, state, and local code requirements for FPLS systems. The Manual has also been revised to include requirements that may be specific to a particular jurisdiction. Careful review of the Manual should be done to confirm that the tasks performed are correct for each facility.

The information provided in this Manual, including all tables and figures, is taken directly from applicable NFPA standards as well as the building and fire codes of the respective jurisdictions.

The requirements, as defined herein, shall be completed for all buildings at all PANYNJ facilities.

II. ROLES AND RESPONSIBILITIES

Line Departments

Facility management is responsible to confirm that FPLS systems are inspected, tested, and maintained as required by building and fire codes. All work performed on systems where the PANYNJ is responsible for maintenance, including work completed by facility maintenance staff and work done by outside contractors working for the PANYNJ, must be documented on the Inspection, Testing, and Maintenance (ITM) Forms provided in this Manual.

Facility management is also responsible for oversight regarding the tenant's responsibility to comply with FPLS inspection, testing, and maintenance requirements. The tenant's responsibility is identified in their respective lease and/or occupancy agreements. For the purpose of this FPLS Manual, "tenant" refers to either a tenant, licensee, or permittee. Audits conducted by Quality Assurance Division, will identify deficiencies in compliance with required inspection, testing, and maintenance requirements. Facility management should have a documented plan or procedure to confirm tenant compliance with all inspection, testing, and maintenance requirements.

Engineering Department

The Engineering Department, through the Quality Assurance Division, conducts annual fire inspections of all buildings throughout the Agency. Fire inspections include an audit of the documentation for the required inspection, testing, and maintenance of fire protection and life safety systems and equipment as identified in this Manual. Deficiencies in compliance are reported to Facility Managers.

The Engineering Department will update the FPLS Manual as required to reflect changes in codes and standards. When the Manual is revised, the Engineering Department will provide information regarding the updates and all necessary technical support to Facility Managers. The Chief Operating Officer, Line Department Directors, Assistant Directors for Asset Management, and Maintenance Managers will be also be advised of changes to the Manual. Facility Managers will be responsible for disseminating Manual revisions to all tenants and to responsible maintenance staff.

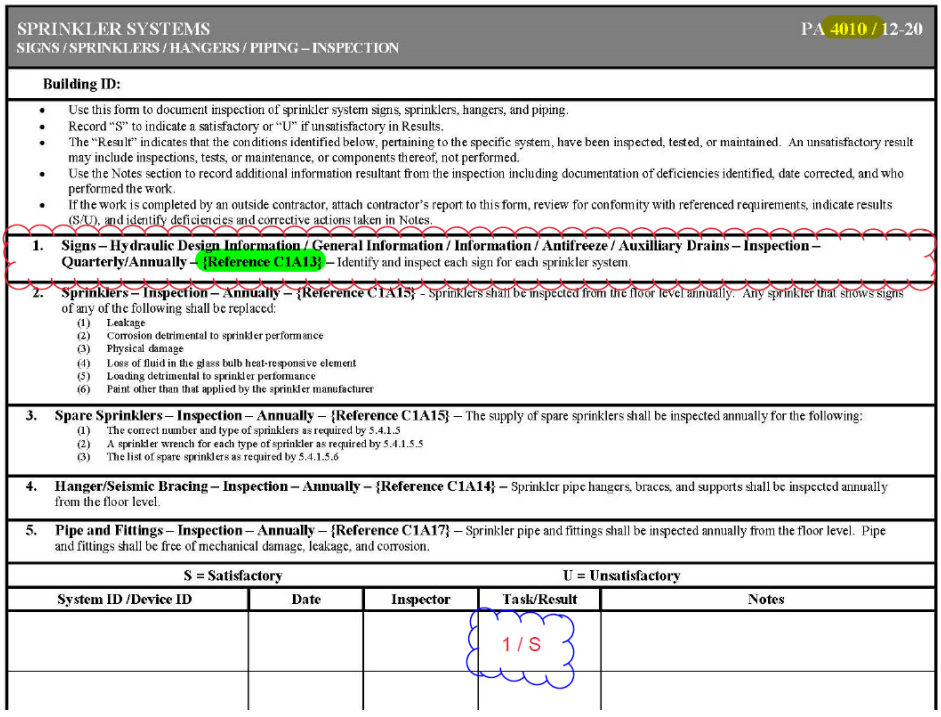
The Manual will be available through the Port Authority's intranet and internet sites. Hard copies of the Manual will not be provided.

III. HOW TO USE THIS MANUAL

This Manual is divided into 18 chapters that identify tasks and information by systems and components. Chapters are subdivided into sections and usually include a general section applicable to all systems and equipment and then requirements applicable to specific systems. Additionally, this Manual was revised to be more user friendly and consolidate all definitions into a new appendix. Previously, definitions were provided for individual chapters.

Tasks are details for work required for inspection, testing, and maintenance. Each task should be considered independent, requiring completion and documentation, but tasks can be combined when working on the same or similar systems for efficiency. Tasks include a frequency, and a PANYNJ form number used for documentation.

The following example is provided to demonstrate how to navigate ITM requirements and how documentation should be completed. Signs identifying hydraulic design information for each sprinkler system is required to inspected routinely. For automatic sprinkler systems, Form PA 4010 is provided to document inspection of these signs. Generally, forms provide a location to document several different tasks. The specific task (No. 1) and the results of the inspection are recorded on the form as shown. A satisfactory inspection is denoted with an "S", while an unsatisfactory inspection is identified with "U".



SPRINKLER SYSTEMS — PA 4010 / 12-20
SIGNS / SPRINKLERS / HANGERS / PIPING – INSPECTION

Building ID:

- Use this form to document inspection of sprinkler system signs, sprinklers, hangers, and piping.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the inspection including documentation of deficiencies identified, date corrected, and who performed the work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Signs – Hydraulic Design Information / General Information / Information / Antifreeze / Auxilliary Drains – Inspection – Quarterly/Annually – {Reference C1A13}** – Identify and inspect each sign for each sprinkler system.
2. **Sprinklers – Inspection – Annually – {Reference C1A15}** - Sprinklers shall be inspected from the floor level annually. Any sprinkler that shows signs of any of the following shall be replaced:
   (1) Leakage
   (2) Corrosion detrimental to sprinkler performance
   (3) Physical damage
   (4) Loss of fluid in the glass bulb heat-responsive element
   (5) Loading detrimental to sprinkler performance
   (6) Paint other than that applied by the sprinkler manufacturer
3. **Spare Sprinklers – Inspection – Annually – {Reference C1A15}** – The supply of spare sprinklers shall be inspected annually for the following:
   (1) The correct number and type of sprinklers as required by 5.4.1.5
   (2) A sprinkler wrench for each type of sprinkler as required by 5.4.1.5.5
   (3) The list of spare sprinklers as required by 5.4.1.5.6
4. **Hanger/Seismic Bracing – Inspection – Annually – {Reference C1A14}** – Sprinkler pipe hangers, braces, and supports shall be inspected annually from the floor level.
5. **Pipe and Fittings – Inspection – Annually – {Reference C1A17}** – Sprinkler pipe and fittings shall be inspected annually from the floor level. Pipe and fittings shall be free of mechanical damage, leakage, and corrosion.

S = Satisfactory — U = Unsatisfactory

System ID /Device ID	Date	Inspector	Task/Result	Notes
			1 / S	

A13. Signs – Hydraulic Design Information / General Information / Information / Antifreeze / Auxilliary Drains — **Inspection**

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 5.2.5*	NYS Annually	The hydraulic design information sign shall be inspected annually to verify that it is provided, attached securely to the sprinkler riser, and is legible.	PA 4010
NFPA 25 2011 5.2.6*	NJ NYC Quarterly	The hydraulic design information sign for hydraulically designed systems shall be inspected quarterly to verify that it is attached securely to the sprinkler riser and is legible.	PA 4010
NFPA 25 2017 A.5.2.5		The hydraulic design information sign should be secured to the riser with durable wire, chain, or equivalent. (See Figure A.5.2.5.) This system as shown on _____ company print no. _____ dated _____ for _____ at _____ contract no. _____ is designed to discharge at a rate of _____ gpm per ft² (L/min per m²) of floor area over a maximum area of _____ ft² (m²) when supplied with water at a rate of _____ gpm (L/min) at _____ psi (bar) at the base of the riser. Hose stream allowance of _____ gpm (L/min) is included in the above. **FIGURE A.5.2.5 Sample Hydraulic Design Information Sign.**	
NFPA 25 2017 5.2.5.1		A hydraulic design information sign that is missing or illegible shall be replaced.	
NFPA 25 2017 5.2.5.2		A pipe schedule system shall have a hydraulic design information sign that reads "Pipe Schedule System."	

Each task on the report form is also provided with a reference to the Manual chapter and section where the requirement to perform the work is detailed. Looking at form PA 4010, Task 1 shows {Reference C1A13} that identifies Chapter 1, Section A13 where information is provided for the specifics of the inspection. In this example, jurisdictional requirements are different between NJ, NY, and NYC. As shown, NJ and NYC require that the signs are inspected quarterly. In NYS, the requirement for inspection is annually. Also included is an example of a hydraulic design information sign and the confirmation that the sign must be replaced if the sign is missing or illegible.

Working with this Manual, unless the task is identified for a specific jurisdiction, then the requirement is applicable to all facilities and jurisdictions. As in this example, the annual inspection of the sign is not applicable in NJ or NYC but only in NYS, whereas the requirement for NJ and NYC is quarterly.

Additionally, all tasks and supporting information are provided with references to the specific standards and/or codes.

IV. ITM DOCUMENTATION

Inspection, Testing, and Maintenance (ITM) documentation shall be retained by management staff responsible for FPLS systems. These records shall be kept on site and available for review by authorized inspection personnel at all times. Documentation of ITM will include but is not limited to:

a. Date;
b. Procedure performed;
c. Name and signature of the servicing personnel and the organization's name that performed the work;
d. Test results
e. Equipment and system deficiencies
f. Corrective actions, including parts replaced and settings or programming changes

Documentation indicating completion of inspections, testing, and maintenance signifies compliance with all requirements for the specified task. Deviation from completing required tasks should be clearly identified for future work scheduling and/or corrective actions.

V. ACRONYMS

The following acronyms are used throughout the Manual. Additonal acronyms may be used in the specific chapters and are usually identified as they are used.

FPLS	Fire Protection and Life Safety
ITM	Inspection, Testing, and Maintenance
PANYNJ	Port Authority of NY & NJ
NFPA	National Fire Protection Association
NJ	New Jersey
NYC	New York City
NYS	New York State
NYCFC	New York City Fire Code
IFCNJ	International Fire Code New Jersey Edition
FCNYS	Fire Code of New York State
DOT	US Department of Transportation

VI. REFERENCES

New York City Building Code – 2014
New York City Fire Code – 2014
Fire Code of New York State – 2020
Building Code of New York State – 2020
International Fire Code – New Jersey Edition – 2015
International Building Code – New Jersey Edition – 2018

National Fire Protection Association (NFPA)

NFPA 10	Standard for Portable Fire Extinguishers
NFPA 11	Low, Medium and High Expansion Foam
NFPA 12	Carbon Dioxide Extinguishing Systems
NFPA 12A	Standard on Halon 1301 Fire Extinguishing Systems
NFPA 13	Standard for the Installation of Sprinkler Systems
NFPA 14	Standard for the Installation of Standpipe and Hose Systems
NFPA 16	Standard for the Installation of Foam-Water and FoamWater Spray systems
NFPA 17	Dry Chemical Extinguishing Systems
NFPA 17A	Wet Chemical Extinguishing Systems
NFPA 20	Standard for the Installation of Centrifugal Fire Pumps
NFPA 22	Water Tanks for Private Fire Protection
NFPA 24	Installation of Private Fire Service Mains and Their Appurtenances
NFPA 25	Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection Systems
NFPA 33	Standard for Spray Application Using Flammable or Combustible Materials
NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 80	Standard for Fire Doors and Other Opening Protectives
NFPA 92	
NFPA 96	Standard for Ventilation Control and Fire Protection of Commercial Cooking

	Operations
NFPA 105	Installation of Smoke Door Assemblies and Other Opening Protectives
NFPA 110	Standard for Emergency and Standby Power Systems
NFPA 111	Standard on Stored Electrical Energy Emergency and Standby Power Systems
NFPA 409	Standard for Aircraft Hangars
NFPA 2001	Standard on Clean Agent Fire Extinguishing System

VII. QAD (Editorial) Comments

- All requirements of the respective jurisdiction shall apply to each facility building, bridge and tunnel, and other structures as may be applicable. The term "building" shall apply broadly, and shall include "trailers," "sheds," "shacks," and "bungalows" when subject to the Building Code or Fire Code, as well as bridges and tunnels. In case of any perceived conflict in applicable standards, the more stringent requirement shall apply.

- NFPA Standards
    - The majority of information provided in the Manual is from the latest adopted editions of the referenced NFPA standards. As of this writing, New York State has adopted newer standards and the referenced editions are used primarily throughout the Manual. Different editions of the standards were reviewed and, outside of the numerical designation, were equivalent in the information provided. When there was a difference in the referenced editions of the same standard, the information is provided specifically for the individual jurisdiction.
    - It should be noted that NFPA standards often reference other NFPA standards or other nationally recognized guidelines. This Manual cannot include all references identified by NFPA. On request, QAD can assist with obtaining information to clarify questions and concerns.
- How QAD can help
    - QAD will provide assistance to facility management, maintenance supervisors, and maintenance staff on all concerns raised regarding the information and requirements in the Manual.
    - QAD can also serve as consultants to facility management regarding tenants and their responsibilities for compliance with FPLS requirements.
- Component Action Requirements
    - An important revision is the addition of the “Component Action Requirements” in Chapters 1, 2, 3, 4, 5, 6, and 17.
    - The Component Action Requirements specify that if a component of a fire protection system is adjusted, repaired, reconditioned, or replaced, specific actions are required to confirm that the affected system performs as originally designed.

CHAPTER 1 – SPRINKLER SYSTEMS

General Requirements for Sprinkler Systems

Applicable in NYC Only

NYCFC 2014 901.6.2.1

Standpipe and sprinkler systems. In addition to those records required by NFPA 25, an approved card bearing the dates of each inspection, certificate of fitness number and signature of the certificate of fitness holder shall be posted on the premises near the main water supply control valve. A detailed inspection report relative to conditions of water supply, gravity and pressure tanks and levels therein, valves, risers, piping, sprinkler heads, hose valves, hose and nozzles, fire department connections, alarms, fire pumps, obstructions, and conditions of all other system equipment and appurtenances shall be completed monthly by the certificate of fitness holder. All defects or violations shall be noted on the inspection report.

NYCFC 2014 901.6.3

Supervision. A person holding a certificate of fitness for the following fire protection systems shall personally supervise the inspection, testing, servicing and other maintenance required by this code or the rules with respect to the system supervised by such certificate of fitness holder:

1. Sprinkler systems.
2. Standpipe systems.
3. Foam fire extinguishing systems.
4. Fire alarm systems.
5. Private fire hydrant systems.
6. Yard hydrant systems.

NYCFC 2014 903.5

Maintenance. Sprinkler systems shall be periodically inspected, tested, serviced and otherwise maintained in accordance with FC901.6 and the rules. Except as otherwise provided in FC 903.5.1 through 903.5.3, sprinkler systems shall be inspected and otherwise maintained as follows:

1. Sprinkler systems shall be inspected at least once a month by a person holding a certificate of fitness, employed by the owner, to ensure that all parts of the system are in perfect working order, and that the department connections, if any, are ready for immediate use by the department. A detailed record of each inspection shall be kept for examination by any representative of the department.

2. There shall be one or more employees instructed in the maintenance of sprinkler systems.

3. There shall be kept available at all times in the premises a supply of at least six extra sprinkler heads to replace promptly any fused or damaged sprinklers.

4. Fire department connections shall be hydrostatically tested at least once every 5 years, in accordance with FC912.6.

NYCFC 2014 903.5.4

Sprinkler system control valve signage. A sign identifying the location of the sidewalk box housing the sprinkler system control valve shall be conspicuously posted on the exterior wall of the building directly opposite the sidewalk box. Such sign shall have red letters 1 inch (25 mm) in height on a white background and read: “Sprinkler System Shutoff Valve (indicate distance) Feet Opposite This Sign” or other approved design.

NYCFC 2014 903.6

Dry pipe sprinkler system valves. In addition to the maintenance requirements set forth in FC903.5, any dry pipe valve installed in a sprinkler system shall be trip tested at least once every 5 years and whenever the system is altered. Such trip test shall be conducted at the owner’s risk, with the control valve fully open and the quick-opening device, if provided, in service, by a master fire suppression contractor licensed by the Department of Buildings before a representative of the department.

NYCFC 2014 912.6 Maintenance. Sprinkler system and standpipe system fire department connections shall be periodically inspected, tested, serviced and otherwise maintained in accordance with FC901.6 and NFPA 25. Upon order of the commissioner, but at least once every 5 years, such fire department connections shall be subjected to a hydrostatic pressure test to demonstrate their suitability for department use. The test shall be conducted in accordance with the rules and at the owner's risk, by his or her representative before a representative of the department.

A. All Sprinkler Systems

A1. Existing Sprinkler Systems General Information — Update — Form PA 4000

Frequency – Annually

Review General Information Form for all Sprinkler Systems, update as required.

A2. New or Altered Sprinkler Systems General Information — Update — Form PA 4000

Frequency – As Required

Complete General Information Form for new Sprinkler System or update General Information Form for Sprinkler System that has been altered to include repairs and/or modifications to components.

A3. Gauges — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.7.1.1*	NYS Monthly	Gauges shall be inspected monthly to verify that the gauge is operable and not physically damaged.	PA 4001
NFPA 25 2017 A.13.2.7.1.1		"Normal water supply pressure" could be a pressure reading that is too high or too low relative to what reasonably would be expected based on system design information, knowledge of the connected water supply, and/or reading data based on past inspections. "Normal" pressure includes pressure expected to be found on a system in order to adequately supply the supplied fire sprinkler system. For example, a gauge reading a pressure close to or below a sprinkler system's demand listed on the design placard would not be expected to be normal because as, the system could have a water supply issue. Normal water supply pressure on a gauge above an alarm or system check valve might be higher than that of a gauge below as a result of trapped pressure surges. This can be typical in buildings with trapped air located close to metal deck roofs without air conditioning. Gridded systems also have a high probability of excess pressure development, which is why NFPA 13 requires relief valves on such systems. Due to the high probability of excess pressure buildup, gridded wet pipe systems should be provided with a relief valve not less than ¼ in. (6.3 mm) in accordance with NFPA 13. It is normal, though, that the pressure above the alarm or system check valve is typically higher than that of the water supply as a result of trapped pressure surges.	
NFPA 25 2014 5.2.4.1	NJ Quarterly	Gauges on wet pipe and deluge sprinkler systems shall be inspected quarterly to ensure that they are in good condition and that normal water supply pressure is being maintained.	PA 4001
NFPA 25 2011 5.2.4.1	NYC Monthly	Gauges on wet pipe sprinkler systems shall be inspected monthly to ensure that they are in good condition and that normal water supply pressure is being maintained.	PA 4001
NFPA 25 2017 13.2.7.1.2	NYS Quarterly	Gauges monitoring water pressure shall be inspected quarterly to verify that normal water supply pressure is being maintained.	PA 4001

NFPA 25 2014 5.2.4.2	NJ Weekly	Gauges on dry and preaction systems shall be inspected weekly to ensure that normal air or nitrogen and water pressures are being maintained.	PA 4001
NFPA 25 2011 5.2.4.2	NYC Weekly	Gauges on dry, preaction, and deluge systems shall be inspected weekly to ensure that normal air and water pressures are being maintained.	PA 4001
NFPA 25 2017 13.2.7.1.3	NYS Monthly	Gauges monitoring air or nitrogen pressure shall be inspected monthly to verify that normal air or nitrogen pressure are being maintained.	PA 4001
NFPA 25 2014 5.2.4.3	NJ NYC Monthly	Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected monthly.	PA 4001
NFPA 25 2017 13.2.7.1.3.2	NYS Quarterly	Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected quarterly.	PA 4001

A4. Gauges Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.7.2*	5 Years	Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.	PA 4001
NFPA 25 2017 13.2.7.3		Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.	

General Requirements for Control Valves (applicable at all facilities)

NFPA 25 2017 13.2.3* — All system valves shall be protected from physical damage and shall be accessible.

NFPA 25 2017 A.13.2.3 — The valves are not required to be exposed. Doors, removable panels, or valve pits can be permitted to satisfy this requirement. Such equipment should not be obstructed by features such as walls, ducts, columns, direct burial, or stock storage.

NFPA 25 2017 13.3.1* — Each control valve shall be identified and have a sign indicating the system or portion of the system it controls.

NFPA 25 2017 A.13.3.1 — Signs identifying underground fire service main control valves in roadway boxes should indicate the direction of valve opening, the distance and direction of the valve from the sign location (if the valve is subject to being covered by snow or ice), and the location of the wrench if not located with the sign.

NFPA 25 2017 13.3.1.1 — Systems that have more than one control valve that must be closed to work on a system shall have a sign on each affected valve referring to the existence and location of other valves.

NFPA 25 2017 13.3.1.2* — When a normally open valve is closed, the procedures established in Chapter 15 shall be followed.

NFPA 25 2017 A.13.3.1.2 — Valves that normally are closed during cold weather should be removed and replaced with devices that provide continuous fire protection service.

NFPA 25 2017 13.3.1.3 — Each normally open valve shall be secured by means of a seal or a lock or shall be electrically supervised in accordance with the applicable NFPA standards.

NFPA 25 2017 13.3.1.4 — Normally closed valves shall be secured by means of a seal or shall be electrically supervised in accordance with the applicable NFPA standard.

A5. Control Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1	Weekly	All valves shall be inspected weekly.	PA 4002
NFPA 25 2017 13.3.2.1.1	Monthly	Valves secured with locks or supervised in accordance with applicable NFPA standards shall be permitted to be inspected monthly.	PA 4002
NFPA 25 2017 13.3.2.1.2	NYS Quarterly	Valves that are electrically supervised shall be permitted to be inspected quarterly.	PA 4002
NFPA 25 2017 13.3.2.2*		The valve inspection shall verify that the valves are in the following condition: (1) In the normal open or closed position (2) * Sealed, locked, or supervised (3) Accessible (4) Post indicator valves (PIVs) are provided with correct wrenches (5) Free from external leaks (6) Provided with applicable identification	
NFPA 25 2017 A.13.3.2.2		Valves should be kept free of snow, ice, storage, or other obstructions so that access is ensured.	
NFPA 25 2017 A.13.3.2.2(2)		The purpose of the valve sealing program is as follows: (1) The presence of a seal on a control valve is a deterrent to closing a valve indiscriminately without obtaining the proper authority. (2) A broken or missing seal on a valve is cause for the plant inspector to verify that protection is not impaired and to notify superiors of the fact that a valve could have been closed without following procedures.	
NFPA 25 2017 13.3.1.2.4	As Required	After any alterations or repairs, an inspection shall be made by the property owner or designated representative to ensure that the system is in service and all valves are in the normal position and properly sealed, locked, or electrically supervised.	

A6. Control Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.1	Annually	Each control valve shall be operated annually through its full range and returned to its normal position.	PA 4002
NFPA 25 2017 13.3.3.2*		Post indicator valves shall be opened until spring or torsion is felt in the rod, indicating that the rod has not become detached from the valve.	
NFPA 25 2017 A.13.3.3.2		A proper wrench needs to be used for this test. Using an improper wrench such as a pipe wrench has resulted in damage to the operating nut. The use of break over bars and extensions on the wrench can damage the valve and/or the post. If the valve cannot be closed and reopened using the proper wrench with reasonable force, then some maintenance and/or repairs are necessary so the valve can be operated when needed in a fire event. These “spring tests” are made to verify that a post indicator valve is fully open. If an operator feels the valve is fully open, he or she should push in the “open” direction. The handle usually moves a short distance (approximately a one-quarter turn) and “springs” back toward the operator in a subtle move when released. This spring occurs when the valve gate pulls up tight against the top of its casting and the valve shaft (being fairly long) twists slightly. The spring indicates that the valve is fully opened and that the gate is attached to the handle. If the gate is jammed due to a foreign particle, the handle is not likely to spring back. If the gate is loose from the handle, the handle continues to turn in the “open” direction with little resistance.	
NFPA 25 2017 13.3.3.2.1		This test shall be conducted every time the valve is closed.	
NFPA 25 2017 13.3.3.3		Post indicator and outside screw and yoke valves shall be backed a one-quarter turn from the fully open position to prevent jamming.	
NFPA 25 2017 13.3.3.4*		A valve status test shall be conducted any time the control valve is closed and reopened at system riser.	
NFPA 25 2017 A.13.3.3.4		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.3.4.1	Annually	The operating stems of outside screw and yoke valves shall be lubricated annually.	PA 4002

NFPA 25 2017 13.3.4.2		The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.	

A7. Control Valve – Supervisory Devices — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1.3	Quarterly	Control valve supervisory alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4002

A8. Control Valve – Supervisory Devices — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.5.1	SemiAnnually	Valve supervisory switches shall be tested semiannually.	PA 4002
NFPA 25 2017 13.3.3.5.2		A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.	
NFPA 25 2017 13.3.3.5.3		The signal shall not be restored at any valve position except the normal position.	

A9. Pressure Reducing & Relief Valves Sprinkler Systems — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.1.1	Quarterly	All valves shall be inspected quarterly to verify that the valves are in the following condition: (1) In the open position (2) Not leaking (3) Maintaining downstream pressures in accordance with the design criteria (4) Handwheels installed and unbroken	PA 4005

A10. Pressure Reducing & Relief Valves Sprinkler Systems — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.1.3	Annually	A partial flow test adequate to move the valve from its seat shall be conducted annually.	PA 4005
NFPA 25 2017 13.5.1.2	5 Years	A full flow test shall be conducted on each valve at 5-year intervals and shall be compared to previous test results.	PA 4005
NFPA 25 2017 13.5.1.2.1		Adjustments shall be made in accordance with the manufacturer's instructions.	

A11. Alarm Devices — Inspection

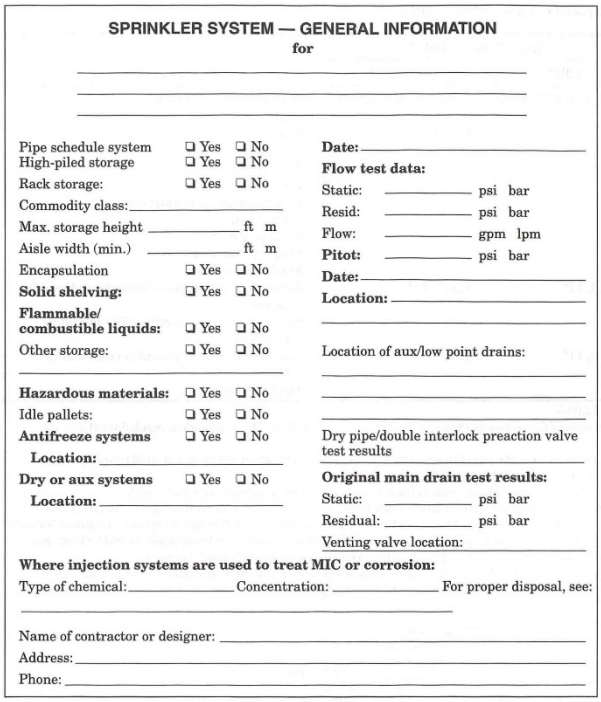
Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 5.2.4	Quarterly	Waterflow alarm and supervisory signal initiating devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4006
NFPA 25 2017 13.2.6.1.1	Quarterly	Mechanical waterflow alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4006
NFPA 25 2017 13.2.6.2.1	Quarterly	Vane-type, paddle-type, and pressure switch-type waterflow alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4006

A12. Alarm Devices — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 5.3.2.1	Quarterly	Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly.	PA 4006
NFPA 25-2017 5.3.2.2*	SemiAnnually	Vane-type and pressure switch–type waterflow alarm devices shall be tested semiannually.	PA 4006
NFPA 25-2017 A.5.3.2.2		Data concerning reliability of electrical waterflow switches indicate no appreciable change in failure rates for those tested quarterly and those tested semiannually. Mechanical motor gongs, however, have additional mechanical and environmental failure modes and need to be tested more often.	
NFPA 25-2017 5.3.2.3		Testing of pressure switch–type waterflow alarm devices on wet pipe systems shall be accomplished by opening the inspector's test connection.	
NFPA 25-2017 5.3.2.4		Testing of vane-type waterflow alarm devices on wet pipe systems shall be accomplished by a flow of water equivalent to the flow out of the smallest single k-factor sprinkler (or smaller) past the flow switch.	
NFPA 25-2017 5.3.2.3.1		Where freezing weather conditions or other circumstances prohibit use of the inspector's test connection, the bypass connection shall be permitted to be used.	
NFPA 25-2017 5.3.2.4.1		The flow switch shall be tested by opening the inspector's test connection at a minimum frequency of once every three years.	
NFPA 25-2017 5.3.2.5		Fire pumps shall not be taken out of service during testing unless constantly attended by qualified personnel or all impairment procedures contained in Chapter 15 are followed.	

A13. Signs – Hydraulic Design Information / General Information / Information / Antifreeze / Auxilliary Drains — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 5.2.5*	NYS Annually	The hydraulic design information sign shall be inspected annually to verify that it is provided, attached securely to the sprinkler riser, and is legible.	PA 4010
NFPA 25 2011 5.2.6*	NJ NYC Quarterly	The hydraulic design information sign for hydraulically designed systems shall be inspected quarterly to verify that it is attached securely to the sprinkler riser and is legible.	PA 4010
NFPA 25 2017 A.5.2.5		The hydraulic design information sign should be secured to the riser with durable wire, chain, or equivalent. (See Figure A.5.2.5.) This system as shown on _____ company print no. _____ dated _____ for _____ at _____ contract no. _____ is designed to discharge at a rate of _____ gpm per ft² (L/min per m²) of floor area over a maximum area of _____ ft² (m²) when supplied with water at a rate of _____ gpm (L/min) at _____ psi (bar) at the base of the riser. Hose stream allowance of _____ gpm (L/min) is included in the above. **FIGURE A.5.2.5 Sample Hydraulic Design Information Sign.**	
NFPA 25 2017 5.2.5.1		A hydraulic design information sign that is missing or illegible shall be replaced.	

NFPA 25 2017 5.2.5.2		A pipe schedule system shall have a hydraulic design information sign that reads “Pipe Schedule System.”	
NFPA 25 2017 5.2.7	Annually	Information Sign. The information sign required by 4.1.9 shall be inspected annually to verify that it is provided, securely attached, and legible.	PA 4010
NFPA 25 2017 5.2.8*	Annually	The general information sign required by NFPA 13 shall be inspected annually to verify that it is provided, securely attached, and legible.	PA 4010
NFPA 25 2017 A.5.2.8		The information sign should be secured with wire, chain, or equivalent to each system control valve, antifreeze loop, and auxiliary system control valve indicating the information required by 4.1.9.	
NFPA 25 2017 4.1.9		Information Sign.	
NFPA 25 2017 4.1.9.1		A permanently marked metal or rigid plastic information sign shall be placed at the system control riser supplying an antifreeze loop, dry system, preaction system, or auxiliary system control valve.	
NFPA 25 2017 4.1.9.2		Each sign shall be secured with a corrosion-resistant wire, chain, or other approved means and shall indicate at least the following information: (1) Location of the area served by the system (2) Location of auxiliary drains and low-point drains for dry pipe and preaction systems (3) The presence and location of antifreeze or other auxiliary systems (4) The presence and location(s) of heat tape	
NFPA 13 2016 25.6*		General Information Sign.	
NFPA 13 2016 A.25.6		While the information on this sign is useful during an inspection, such use should not be considered a hazard assessment based on the requirements of this standard. (See Figure A.25.6.)  SPRINKLER SYSTEM — GENERAL INFORMATION for Pipe schedule system ❑ Yes ❑ No High-piled storage ❑ Yes ❑ No Rack storage: ❑ Yes ❑ No Commodity class: Max. storage height ft m Aisle width (min.) ft m Encapsulation ❑ Yes ❑ No Solid shelving: ❑ Yes ❑ No Flammable/ combustible liquids: ❑ Yes ❑ No Other storage: ❑ Yes ❑ No Hazardous materials: ❑ Yes ❑ No Idle pallets: ❑ Yes ❑ No Antifreeze systems ❑ Yes ❑ No Location: Dry or aux systems ❑ Yes ❑ No Location: Date: Flow test data: Static: psi bar Resid: psi bar Flow: gpm lpm Pitot: psi bar Date: Location: Location of aux/low point drains: Dry pipe/double interlock preaction valve test results Original main drain test results: Static: psi bar Residual: psi bar Venting valve location: Where injection systems are used to treat MIC or corrosion: Type of chemical: Concentration: For proper disposal, see: Name of contractor or designer: Address: Phone: FIGURE A.28.6 Sprinkler System General Information.	
NFPA 13 2016 25.6.1		The installing contractor shall provide a general information sign used to determine system design basis and information relevant to the inspection, testing, and maintenance requirements required by NFPA 25.	
NFPA 13 2016 25.6.1.1		Such general information shall be provided with a permanently marked weatherproof metal or rigid plastic sign, secured with corrosion-resistant wire, chain, or other acceptable means.	
NFPA 13 2016 25.6.1.2		Such signs shall be placed at each system control riser, antifreeze loop, and auxiliary system control valve.	
NFPA 13 2016 25.6.2		The sign shall include the following information: (1) Name and location of the facility protected (2) Occupancy classification (3) Commodity classification (4) Presence of high-piled and/or rack storage (5) Maximum height of storage planned	

		(6) Aisle width planned (7) Encapsulation of pallet loads (8) Presence of solid shelving (9) Flow test data (10) Presence of flammable/combustible liquids (11) Presence of hazardous materials (12) Presence of other special storage (13) Location of venting valve (14) Location of auxiliary drains and low point drains on dry pipe and preaction systems (15) Original results of main drain flow test	
		(16) Original results of dry pipe and double interlock preaction valve test (17) Name of installing contractor or designer (18) Indication of presence and location of antifreeze or other auxiliary systems (19) Where injection systems are installed to treat MIC or corrosion, the type of chemical, concentration of the chemical, and where information can be found as to the proper disposal of the chemical	
NFPA 25 2017 5.2.9	Annually	Antifreeze Information Sign. The antifreeze information sign required by 4.1.10 shall be inspected annually to verify that it is present, securely attached, and legible.	PA 4010
NFPA 25 2017 4.1.10		Antifreeze Information Sign. An antifreeze information sign shall be placed on the antifreeze system main valve, which indicates the manufacture type and brand of the antifreeze solution, the concentration by volume of the antifreeze solution used, and the volume of the antifreeze solution used in the system.	
NFPA 25 2017 13.4.5.1.2		Systems with auxiliary drains shall require a sign at the dry valve indicating the number of auxiliary drains and the location of each individual drain.	
NFPA 25 2017 13.4.3.1.6		Preaction systems with auxiliary drains shall require a sign at the valve indicating the number of auxiliary drains and the location of each individual drain.	

A14. Hanger/Seismic Bracing — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 5.2.3*	Annually	Hangers, Braces, and Supports. Sprinkler pipe hangers, braces, and supports shall be inspected annually from the floor level.	PA 4010
NFPA 25 2017 A.5.2.3		The conditions described in this section can have a detrimental effect on the performance of hangers and braces by allowing failures if the components become loose.	
NFPA 25 2017 5.2.3.1		Hangers, braces, and supports shall not be damaged, loose, or unattached.	
NFPA 25 2017 5.2.3.2		Hangers, braces, and supports that are damaged, loose, or unattached shall be replaced or refastened.	
NFPA 25 2017 5.2.3.3*		Hangers, braces, and supports installed in concealed spaces such as above suspended ceilings shall not require inspection.	
NFPA 25 2017 A.5.2.3.3		Examples of hangers and seismic braces installed in concealed areas include some floor/ceiling or roof/ceiling assemblies, areas under theater stages, pipe chases, and other inaccessible areas.	
NFPA 25 2017 5.2.3.4		Hangers, braces, and supports installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.	

A15. Sprinklers — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 A.5.2		The provisions of the standard are intended to apply to routine inspections. In the event of a fire, a post-fire inspection should be made of all sprinklers within the fire area. In situations where the fire was quickly controlled or extinguished by one or two sprinklers, it might be necessary only to replace the activated sprinklers. Care should be taken that the replacement sprinklers are of the same make and model or that they have compatible performance characteristics (see 5.4.1.2). Soot covered sprinklers should be replaced because deposits can result in corrosion of operating parts. In the event of a substantial fire, special consideration should be given to replacing the first ring of sprinklers surrounding the operated sprinklers because of the potential for excessive thermal exposure, which could weaken the response mechanisms.	
NFPA 25 2017 5.2.1.1	Annually	Sprinklers shall be inspected from the floor level annually.	PA 4010

NFPA 25 2017 5.2.1.1.1*		Any sprinkler that shows signs of any of the following shall be replaced: (1) Leakage (2) Corrosion detrimental to sprinkler performance (3) Physical damage (4) Loss of fluid in the glass bulb heat-responsive element (5) Loading detrimental to sprinkler performance (6) Paint other than that applied by the sprinkler manufacturer	
NFPA 25 2017 A.5.2.1.1.1		The conditions described in this section can have a detrimental effect on the performance of sprinklers by adversely impacting water distribution patterns, insulating thermal elements delaying operation, or otherwise rendering the sprinkler inoperable or ineffectual. Severely corroded or loaded sprinklers should be reported as a deficiency or impairment as part of the visual inspection and designated to be replaced. Such sprinklers could be affected in their distribution or other performance characteristics not addressed by routine sample testing. Corrosion found on the seat, or built up on the deflector that could affect the spray pattern, or a buildup on the operating elements that could affect the operation can have a detrimental effect on the performance of the sprinkler. Lightly loaded sprinklers or sprinklers having limited corrosion that does not impact the water distribution characteristics can continue to be used if the samples are selected for testing in accordance with 5.3.1 based on worst-case conditions and if the samples successfully pass the tests. Surface discoloration that does not impact the performance of the sprinkler should not warrant replacement or testing. Multiple sprinkler operations within a facility without a fire might be a sign of exposure to excessive temperatures, sprinkler damage, or excessive corrosion of similar sprinklers installed in that facility. Consideration should be given to replacing sprinklers that are considered representative of the operated sprinklers. Glass bulbs in sprinklers exposed to sunlight or installed in cold environments such as walk-in coolers and freezers might lose or change their temperature classification color due to the environment. This loss of color should not be confused with loss of fluid in the glass bulb. Tests have shown that this loss or change of color in the bulb does not affect the operation or any other performance characteristics of the sprinkler, and these sprinklers can be allowed to remain in service. The tests also showed that when sprinklers installed in cold environments were subjected to temperatures above 60°F (15.5°C), the fluid color returned. In lieu of replacing sprinklers that are loaded with a coating of dust, it is permitted to clean sprinklers with compressed air or a vacuum, provided that the equipment does not touch the sprinkler.	
NFPA 25 2017 5.2.1.1.2		Any sprinkler that has been installed in the incorrect orientation shall be corrected by repositioning the branchline, drop, or sprig, or shall be replaced.	
NFPA 25 2017 5.2.1.1.3*		Sprinklers installed in concealed spaces such as above suspended ceilings shall not require inspection.	
NFPA 25 2017 A.5.2.1.1.3		Examples include spaces above ceilings, whether the ceilings are lay-in tile or gypsum board, areas under theater stages, pipe chases, and other inaccessible areas, even if access panels or hatches are provided into the areas. Where temporary listed membrane ceilings are installed, NFPA 13 allows sprinkler protection to be omitted below the “drop out” membrane ceiling. These areas should be inspected during periods when the membrane ceiling is not present.	
NFPA 25 2017 5.2.1.1.4		Sprinklers installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.	
NFPA 25 2017 5.2.1.1.5		Escutcheons and coverplates for recessed, flush, and concealed sprinklers shall be replaced with their listed escutcheon or coverplate if found missing during the inspection.	
NFPA 25 2017 5.2.1.1.5.1		Where the listed escutcheon or coverplate from a listed assembly is missing and is no longer commercially available, the sprinkler shall be replaced.	
NFPA 25 2017 5.2.1.1.6		Escutcheons for pendent sprinklers that are not recessed, flush, or concealed shall not be required to be replaced if found missing during the inspection.	
NFPA 25 2017 5.2.1.2*		The minimum clearance to storage as described in 5.2.1.2.1 through 5.2.1.2.6 shall be maintained below all sprinkler deflectors.	
NFPA 25 2017 A.5.2.1.2		NFPA 13 in the storage definitions defines clearance as the distance from the top of storage to the ceiling sprinkler deflectors. Other obstruction rules are impractical to enforce under this standard. However, if obstructions that might cause a concern are present, the owner is advised to have an engineering evaluation performed.	
NFPA 25 2017 5.2.1.2.1*		Unless greater distances are required by 5.2.1.2.2, 5.2.1.2.3, or 5.2.1.2.4, or lesser distances are permitted by 5.2.1.2.6, learance between the deflector and the top of storage shall be 18 in. (457 mm) or greater.	

NFPA 25 2017 A.5.2.1.2.1		The 18 in. (457 mm) clearance rule generally applies to standard pendent, upright and sidewall spray sprinklers, extended coverage upright and pendent sprinklers, and residential sprinklers.	
NFPA 25 2017 5.2.1.2.2		Where standards other than NFPA 13 specify greater clearance to storage minimums, they shall be followed.	
NFPA 25 2017 5.2.1.2.3*		Clearance between the deflector and the top of storage shall be 36 in. (914 mm) or greater for special sprinklers.	
NFPA 25 2017 A.5.2.1.2.3		The special sprinklers that the minimum 36 in. (915 mm) clearance rule generally applies to includes large drop sprinklers, CMSA sprinklers, and early suppression fast-response (ESFR) sprinklers.	
NFPA 25 2017 5.2.1.2.4		Clearance from the top of storage to sprinkler deflectors shall be 36 in. (914 mm) or greater where rubber tires are stored.	
NFPA 25 2017 5.2.1.2.5		In-rack sprinklers shall not be required to meet the obstruction criteria and clearance from storage requirements.	
NFPA 25 2017 5.2.1.2.6*		Clearance between the deflector and the top of storage shall be permitted to be less than 18 in. (457 mm) where shown to be permitted by the installation standard.	
NFPA 25 2017 A.5.2.1.2.6		The purpose of maintaining a minimum clearance is to ensure water discharge is not obstructed. There are certain installations where this can be achieved by other means. Examples include library stacks, record storage, and where sprinklers are installed in aisles in between storage shelving. Clearance is also not needed for shelving along perimeter walls since this does not cause an obstruction. NFPA 13 allows a clearance less than 18 in. (457 mm) where full-scale fire tests demonstrate an acceptable sprinkler discharge pattern. Also, where sufficient shielding of the sprinkler spray pattern has resulted in an increase in the hazard classification to Extra Hazard Group 2, a clearance less than 18 in. (457 mm) might be acceptable.	
NFPA 25 2017 5.2.1.3*		Storage closer to the sprinkler deflector than permitted by the clearance rules of the installation standard described in 5.2.1.2.1 through 5.2.1.2.4 shall be corrected.	
NFPA 25 2017 A.5.2.1.3		Sprinkler spray patterns should not be obstructed by temporary or nonpermanent obstructions such as signs, banners, or decorations. While it is impractical for an inspector to know all of the various obstruction rules for all the different types of sprinklers, the inspector can observe when temporary or nonpermanent obstructions have been installed that could block or obstruct a sprinkler's spray pattern. Temporary or non-permanent obstructions that appear to be obstructions to sprinkler spray patterns should be removed or repositioned so they are not an obstruction.	
NFPA 25 2017 5.2.1.4	Annually	The supply of spare sprinklers shall be inspected annually for the following: (1) The correct number and type of sprinklers as required by 5.4.1.5 (2) A sprinkler wrench for each type of sprinkler as required by 5.4.1.5.5 (3) The list of spare sprinklers as required by 5.4.1.5.6	PA 4010
NFPA 25-2017 5.4.1.5*		A supply of at least six spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or been damaged in any way can be promptly replaced.	
NFPA 25-2017 A.5.4.1.5		A minimum of two sprinklers of each type and temperature rating installed should be provided.	
NFPA 25-2017 5.4.1.5.3		Where dry sprinklers of different lengths are installed, spare dry sprinklers shall not be required, provided that a means of returning the system to service is furnished.	
NFPA 25-2017 5.4.1.5.4		The stock of spare sprinklers shall include all types and ratings installed and shall be as follows: (1) For protected facilities having under 300 sprinklers — no fewer than 6 sprinklers (2) For protected facilities having 300 to 1000 sprinklers — no fewer than 12 sprinklers (3) For protected facilities having over 1000 sprinklers — no fewer than 24 sprinklers	
NFPA 25-2017 5.4.1.5.5*		One sprinkler wrench as specified by the sprinkler manufacturer shall be provided in the cabinet for each type of sprinkler installed to be used for the removal and installation of sprinklers in the system.	
NFPA 25-2017 A.5.4.1.5.5		One sprinkler wrench design can be appropriate for many types of sprinklers, and multiple wrenches of the same design should not be required.	
NFPA 25-2017 5.4.1.5.6		A list of the sprinklers installed in the property shall be posted in the sprinkler cabinet.	
NFPA 25-2017 5.4.1.5.6.1*		The list shall include the following: (1) Sprinkler identification number (SIN) if equipped; or the manufacturer, model, orifice, deflector type, thermal sensitivity, and pressure rating (2) General description (3) Quantity of each type to be contained in the cabinet (4) Issue or revision date of the list	

NFPA 25-2017 A.5.4.1.5.6.1		The minimum information in the list contained in the spare sprinkler cabinet should be marked with the following: (1) General description of the sprinkler, including upright, pendent, residential, ESFR, and so forth (2) Quantity of sprinklers to be maintained in the spare sprinkler cabinet An example of the list is shown in Figure A.5.4.1.5.6.1. **Sprinklers Contained in this Cabinet** Sprinkler Identification, SIN | General Description | Temperature Rating, °F | Sprinkler Quantity Maintained TY9128 | Extended Coverage, K-25, upright | 155 | 6 VK425 | Concealed pendent residential | 145 | 6 Issued: 10/3/05 Revised: FIGURE A.5.4.1.5.6.1 Sample List. [13:Figure A.6.2.9.7.1]	
NFPA 25-2017 5.4.1.6*		Sprinklers shall not be altered in any respect or have any type of ornamentation, paint, or coatings applied after shipment from the place of manufacture.	
NFPA 25-2017 A.5.4.1.6		Corrosion-resistant or specially coated sprinklers should be installed in locations where chemicals, moisture, or other corrosive vapors exist.	

A16. Sprinklers — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 A.5.3.1		The sprinkler field service testing described in this section is considered routine testing. Nonroutine testing should be conducted to address unusual conditions not associated with the routine test cycles mandated within this standard. Due to the nature of nonroutine testing, specific tests cannot be identified in this standard. The type of tests to be conducted and the number and location of samples to be submitted should be appropriate to the problem discovered or being investigated and based on consultation with the manufacturer, listing agency, and the authority having jurisdiction. Where documentation of the installation date is not available, the start date for the in-service interval should be based upon the sprinkler's manufacture date.	
NFPA 25-2017 5.3.1.1*		Where required by this section, sample sprinklers shall be submitted to a recognized testing laboratory acceptable to the authority having jurisdiction for field service testing.	
NFPA 25-2017 A.5.3.1.1		Sprinklers should be first given a visual inspection in accordance with 5.2.1.1.1 to determine if replacement is required. Sprinklers that have passed the visual inspection should then be laboratory tested for sensitivity and functionality. The waterway should clear when sensitivity/functionality tested at 5 psi (0.4 bar) or the minimum listed operating pressure for dry sprinklers. Thermal sensitivity should be not less than that permitted in post-corrosion testing of new sprinklers of the same type. Sprinklers that have been in service for a number of years should not be expected to have all of the performance qualities of a new sprinkler. However, if there is any question about their continued satisfactory performance, the sprinklers should be replaced.	
NFPA 25-2017 5.3.1.1.1	50 Years	Where sprinklers have been in service for 50 years, they shall be replaced or representative samples from one or more sample areas shall be tested.	PA 4008
NFPA 25-2017 5.3.1.1.1.1	10 Year Intervals	Test procedures shall be repeated at 10-year intervals.	PA 4008
NFPA 25-2017 5.3.1.1.1.2		Sprinklers manufactured prior to 1920 shall be replaced.	

NFPA 25-2017 5.3.1.1.1.3*	10 Year Intervals	Sprinklers manufactured using fast-response elements that have been in service for 20 years shall be replaced or representative samples shall be tested and then retested at 10-year intervals.	PA 4008
NFPA 25-2017 A.5.3.1.1.1.3		Sprinklers defined as fast response have a thermal element with an RTI of 50 (meters-seconds)1⁄2 or less. A quick-response sprinkler, residential sprinkler, and early suppression fast-response (ESFR) sprinklers are examples of fast-response sprinklers.	
NFPA 25-2017 5.3.1.1.1.4*	5 Year Intervals	Representative samples of solder-type sprinklers with a temperature classification of extra high [325°F (163°C)] or greater that are exposed to semicontinuous to continuous maximum allowable ambient temperature conditions shall be tested at 5-year intervals.	PA 4008
NFPA 25-2017 A.5.3.1.1.1.4		Due to solder migration caused by the high temperatures to which these devices are exposed, it is important to test them every 5 years. Because of this phenomenon, the operating temperature can vary over a wide range.	
NFPA 25-2017 5.3.1.1.1.5	75 Years	Where sprinklers have been in service for 75 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory acceptable to the authority having jurisdiction for field service testing and repeated at 5-year intervals.	PA 4008
NFPA 25-2017 5.3.1.1.1.6*	10 Years	Dry sprinklers that have been in service for 10 years shall be replaced or representative samples shall be tested and then retested at 10-year intervals.	PA 4008
NFPA 25-2017 A.5.3.1.1.1.6		See 3.3.40.4.	
NFPA 25-2017 3.3.40.4		Dry Sprinkler. A sprinkler secured in an extension nipple that has a seal at the inlet end to prevent water from entering the nipple until the sprinkler operates. [13, 2016]	
NFPA 25-2017 5.3.1.1.2*	5 Years	Where sprinklers are subjected to harsh environments, including corrosive atmospheres and corrosive water supplies, on a 5-year basis, either sprinklers shall be replaced or representative sprinkler samples shall be tested.	PA 4008
NFPA 25-2017 A.5.3.1.1.2		Examples of these environments are paper mills, packing houses, tanneries, alkali plants, organic fertilizer plants, foundries, forge shops, fumigation areas, pickle and vinegar works, stables, storage battery rooms, electroplating rooms, galvanizing rooms, steam rooms of all descriptions including moist vapor dry kilns, salt storage rooms, locomotive sheds or houses, driveways, areas exposed to outside weather, around bleaching equipment in flour mills, and portions of any area where corrosive vapors prevail. Harsh water environments include water supplies that are chemically reactive.	
NFPA 25-2017 5.3.1.1.3		Where historical data indicate, longer intervals between testing shall be permitted.	
NFPA 25-2017 5.3.1.2*		A representative sample of sprinklers for testing per 5.3.1.1.1 shall consist of a minimum of not less than four sprinklers or 1 percent of the number of sprinklers per individual sprinkler sample, whichever is greater.	
NFPA 25-2017 A.5.3.1.2		Within an environment, similar sidewall, upright, and pendent sprinklers produced by the same manufacturer could be considered part of the same sample, but additional sprinklers would be included within the sample if produced by a different manufacturer.	
NFPA 25-2017 5.3.1.3		Where one sprinkler within a representative sample fails to meet the test requirement, all sprinklers within the area represented by that sample shall be replaced.	
NFPA 25-2017 5.3.1.3.1		Manufacturers shall be permitted to make modifications to their own sprinklers in the field with listed devices that restore the original performance as intended by the listing, where acceptable to the authority having jurisdiction.	

A17. Pipe and Fittings — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 5.2.2*	Annually	Sprinkler pipe and fittings shall be inspected annually from the floor level.	PA 4010
NFPA 25-2017 A.5.2.2		The conditions described in 5.2.2 can have a detrimental effect on the performance and life of pipe by affecting corrosion rates or pipe integrity or otherwise rendering the pipe ineffectual.	
NFPA 25-2017 5.2.2.1*		Pipe and fittings shall be free of mechanical damage, leakage, and corrosion.	
NFPA 25-2017 A.5.2.2.1		Surface corrosion not impacting the integrity of the piping strength or raising concern of potential leakage should not warrant the replacement of piping. A degree of judgment should be exercised in the determination of the extent of corrosion that would necessitate replacement.	
NFPA 25-2017 5.2.2.2		Sprinkler piping shall not be subjected to external loads by materials either resting on the pipe or hung from the pipe.	
NFPA 25-2017 5.2.2.3*		Pipe and fittings installed in concealed spaces such as above suspended ceilings shall not require inspection.	
NFPA 25-2017 A.5.2.2.3		Examples include some floor/ceiling or roof/ceiling assemblies, areas under theater stages, pipe chases, and other inaccessible areas.	

NFPA 25-2017 5.2.2.4		Pipe and fittings installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.	

A18. Main Drain — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 13.2.5*	Annually	A main drain test shall be conducted annually for each water supply lead-in to a building waterbased fire protection system to determine whether there has been a change in the condition of the water supply.	PA 4011
NFPA 25-2017 A.13.2.5		Main drains are installed on system risers for one principal reason: to drain water from the overhead piping after the system is shut off. This allows the contractor or plant maintenance department to perform work on the system or to replace nozzles after a fire or other incident involving system operation. Data collected from the suction gauges during a fire pump flow test that test the water supply would satisfy the requirements for a main drain test. These drains also are used to determine whether there is a major reduction in waterflow to the system, such as could be caused by a major obstruction, a dropped gate, a valve that is almost fully closed, or a check valve clapper stuck to the valve seat. A satisfactory main drain test (i.e., one that reflects the results of previous tests) does not necessarily indicate an unobstructed passage, nor does it prove that all valves in the upstream flow of water are fully opened. However, these tests provide a reasonable level of confidence that the water supply has not been compromised. The main drain test is conducted in the following manner: (1) Record the pressure indicated by the supply water gauge. (2) Close the alarm control valve on alarm valves. (3) Fully open the main drain valve. (4) After the flow has stabilized, record the residual (flowing) pressure indicated by the water supply gauge. (5) Close the main drain valve slowly.	
NFPA 25-2017 13.2.5.1		Where the lead-in to a building supplies a header or manifold serving multiple systems, a single main drain test shall be permitted.	
NFPA 25-2017 13.2.5.2	Quarterly	In systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves, the main drain test of at least one system downstream of the device shall be conducted on a quarterly basis.	PA 4011
NFPA 25-2017 13.2.5.3		When there is a 10 percent reduction in full flow pressure when compared to the original acceptance test or previously performed tests, the cause of the reduction shall be identified and corrected if necessary.	

A19. Obstruction Investigation — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 14.2.1*		An assessment of the internal condition of piping shall be conducted on a frequency determined by 14.2.1.1 or 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.	
NFPA 25-2017 A.14.2.1		It is the intent of this requirement to provide a reasonable assurance that corrosion and obstruction issues within fire protection systems are identified. It is not the intent to require verification that every piece of pipe in the system is free from corrosion and obstructions. An assessment of the internal condition of piping can be accomplished by several methods that meet the intent of this section. These methods include the following: 1) Fire sprinkler systems, foam systems, and water mist systems. a) Opening a flushing connection at the end of one main and removing the end fitting or piece of branch line or a sprinkler for the purpose of inspecting for the presence of foreign organic and inorganic material. i) In dry pipe systems and preaction systems, the branch line inspected should be the most remote one from the source of water that is not equipped with the inspector's test valve.	

		ii. When performing normal maintenance that involves draining down a system to modify a system such as for tenant fit out or building renovations, or when removing or replacing piping, this inspection can be performed as described and properly recorded at that time. The time interval would then start for the next assessment of that system at the frequency determined by 14.2.1.1 or 14.2.1.2. ii) If a sprinkler is removed to perform this inspection, 5.4.1.1 requires a new sprinkler matching the characteristics of the replaced sprinkler. b) Utilizing alternative examination methods such as the following: i) Using video inspection equipment that is inserted into the system at strategic points to observe the internal condition of pipes. This equipment provides a visual exam of the pipes using a camera and lighting system on the end of a push cable. Video inspection equipment can be inserted in alarm, dry, and preaction valves for a look into risers, feed mains, some cross mains, and some branch lines, depending on the system configuration. The push cable can also be inserted in a check valve when performing the five-year internal inspection required by 13.4.2.1 to view additional areas of a system, and in the fire department connection to perform the interior inspection required by 13.8.3. ii) Ultrasonic or similar technology that allows the pipe wall to be tested to determine the extent of any deterioration due to microbiologically influenced corrosion (MIC) or other forms of corrosion. This method would not typically be used for the internal inspection of piping required by this section because it might not detect the presence of solid material in the piping, such as wood, plastic, or other foreign obstructions, that are not a byproduct of corrosion, because only small representative sections of pipe are examined. iii. A laboratory analysis of water samples obtained from the fire protection system, combined with collecting and inspecting solid material from fire protection system water discharged from a main drain, and an inspector's test connection, can provide an indication of the presence of corrosion, MIC, and/or foreign materials. If a high level of MIC is identified, or if a significant amount of foreign materials is found, further investigation might be warranted to verify the extent of corrosion, MIC, or other obstructions in the system. The solid materials should be collected with an appropriately sized strainer. If inspection of the solid materials identifies excessive rust, black water color, or sulfur (rotten egg) odors, an obstruction investigation as described in Section 14.3 is warranted.	
NFPA 25-2017 14.2.1.1	5 Years	An assessment of the internal condition of piping shall be conducted at a minimum of every 5 years or in accordance with 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.	PA 4009
NFPA 25-2017 14.2.1.2*		Where an assessment frequency has been established by an approved risk analysis, the assessment shall be performed at a frequency determined by the approved risk analysis.	
NFPA 25-2017 A.14.2.1.2		The purpose of the assessment of the internal condition of piping is to identify whether foreign organic and inorganic material is present, since the presence of such material can potentially be detrimental to the performance of the sprinkler system. Corrosion, which includes microbiologically influenced corrosion (MIC), can be prevalent in sprinkler piping, but not necessarily in all systems, buildings, or geographic locations. Therefore, the risk analysis should be based upon evidence noted and/or data obtained from proximate sprinkler systems, known problems from the water supply, as well as other factors that could affect the integrity of the system piping. The decision of when, how often, and which method to use to conduct an assessment should also consider the risk of emptying and refilling the sprinkler system with water, which could adversely impact the sprinkler system by introducing foreign or inorganic material into the sprinkler system.	
NFPA 25-2017 14.2.1.3		Tubercules or slime, if found, shall be tested for indications of microbiologically influenced corrosion (MIC).	
NFPA 25-2017 14.2.1.4*		If the presence of sufficient foreign organic or inorganic material is found to obstruct pipe or sprinklers, an obstruction investigation shall be conducted as described in Section 14.3.	
NFPA 25-2017 A.14.2.1.4		Most piping systems contain some foreign material or other evidence of corrosion but not sufficient to trigger an obstruction investigation. Furthermore, an internal inspection is primarily an inspection for determining corrosion of the pipe, but it can result in finding the presence of material that would be an obstruction to piping or sprinklers. If such is found, an obstruction investigation in Section 14.3 would be required.	
NFPA 25-2017 14.2.1.5		Nonmetallic pipe shall not be required to comply with Section 14.2.	
NFPA 25-2017 14.2.2*		In buildings having multiple wet pipe systems, every other system shall have an assessment of the internal condition of piping as described in 14.2.1.	
NFPA 25-2017 A.14.2.2		In large warehouses, high-rise buildings, and other buildings having multiple systems, it is reasonable to perform the assessment on half of the systems, and conclude that these are representative of all systems in the building. The systems in the building not assessed during one frequency cycle should be assessed during the next one. As long as there is no evidence of any foreign organic and/or inorganic material found in any of the systems being assessed, every	

		other system would be assessed once every frequency cycle. However, if foreign organic and/or inorganic material is found in any system in the building during the frequency cycle, all systems must would then be assessed during that frequency cycle.	
NFPA 25-2017 14.2.2.1		During the next inspection frequency required by 14.2.1.1 or 14.2.1.2, the alternate systems not assessed during the previous assessment shall be assessed as described in 14.2.1.	
NFPA 25-2017 14.2.2.2		If foreign organic and/or inorganic material is found in any system in a building, all systems shall be assessed.	
NFPA 25-2017 14.3.2*		Systems shall be examined for internal obstructions where conditions exist that could cause obstructed piping.	
NFPA 25-2017 A.14.3.2		For obstruction prevention program recommendations, see Section D.4.	
NFPA 25-2017 D.4		Obstruction Prevention Program. Possibly include in an appendix or provide upon request.	
NFPA 25-2017 14.3.2.1		If the condition has not been corrected or the condition is one that could result in obstruction of the piping despite any previous flushing procedures that have been performed, the system shall be examined for internal obstructions every 5 years.	
NFPA 25-2017 14.3.2.2*		Internal examination shall be performed at the following minimum four points: (1) System valve (2) Riser (3) Cross main (4) Branch line	
NFPA 25-2017 A.14.3.2.2		The indicated locations are presented as the minimum basis for determining the need for the initiation of a more extensive obstruction investigation effort. Additional points of examination can be appropriately dictated to assess the extent and severity of the obstructing material as determined by the observed conditions at these locations. See Section D.3 for further discussion.	
NFPA 25-2017 D.3		Investigation Procedures. Possibly include in an appendix or provide upon request.	
NFPA 25-2017 14.3.2.3*		Alternative nondestructive examination methods shall be permitted.	
NFPA 25-2017 A.14.3.2.3		Alternative examination methods can include the following: (1) Using video inspection equipment that is inserted into the system at strategic points to observe the internal condition of pipes. This equipment provides a visual exam of the pipes using a camera and lighting system on the end of a push cable. Video inspection equipment can be inserted in alarm, dry, and preaction valves, in the risers, and into cross mains and branch lines, depending on the system configuration. This equipment can also be used to determine the results of any flushing that was performed. (2) Ultrasonic or similar technology that allows the pipe wall to be externally tested to determine the extent of any deterioration due to MIC or other forms of corrosion. This method has advantages including allowing the system to be left in service while performing the examination, and pinpointing where pipes are about to fail before the actual failure occurs, allowing preventive action to be taken. This technology does have its limitations, and to be thorough all pipes would require access, even those in concealed spaces such as those above ceilings. This technology can detect the presence of a buildup of sludge, scale, or other by-products of corrosion, and can detect existing air pockets in wet systems as well as trapped sections of pipe in dry systems that aren't adequately drained. This technology cannot detect the presence of MIC itself, but can detect tubercules caused by MIC. In most cases this technology will not detect the presence of solid material in the piping such as wood, plastic, or other foreign obstructions that are not a by-product of corrosion, because only small representative sections of pipe are examined.	
NFPA 25-2017 14.3.3*		If an obstruction investigation indicates the presence of sufficient material to obstruct pipe or sprinklers, a complete flushing program shall be conducted by qualified personnel.	
NFPA 25-2017 A.14.3.3		For obstruction investigation flushing procedures, see Section D.5.	
NFPA 25-2017 D.5		Flushing Procedures. Possibly include in an appendix or provide upon request.	
NFPA 25-2017 14.3.4		Tubercules or slime, if found during an obstruction investigation, shall be tested for indications of microbiologically influenced corrosion (MIC).	
NFPA 25-2017 14.4.		Ice Obstruction. Dry pipe or preaction sprinkler system piping that protects or passes through refrigerated spaces maintained at temperatures below 32°F (0°C) shall be inspected internally on an annual basis for ice obstructions at the point where the piping enters the refrigerated area.	

NFPA 25-2017 14.4.1		Alternative nondestructive examinations shall be permitted.	
NFPA 25-2017 14.4.2		All penetrations into the refrigerated spaces shall be inspected and, if an ice obstruction is found, additional pipe shall be examined to ensure that no additional ice obstructions or ice blockages exist.	

B. Component Action Requirements

B1. Component Action Requirements — Adjusted, Repaired Reconditioned, Replaced

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 5.5.1		Whenever a component in a sprinkler system is adjusted, repaired, reconditioned, or replaced, the actions required in Table 5.5.1 shall be performed.	
NFPA 25-2017 5.5.2		Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.	
NFPA 25-2017 5.5.3		These actions shall not require a design review, which is outside the scope of this standard.	

Table 5.5.1 Summary of Component Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Required Action
Water Delivery Components				
Pipe and fittings affecting not more than 20 sprinklers	X	X	X	Inspect for leaks at system working pressure
Pipe and fittings affecting more than 20 sprinklers	X	X	X	Hydrostatic test in conformance with NFPA 13
Sprinklers, regardless of number	X		X	Inspect for leaks at system working pressure
Sprinklers, more than 20	X		X	Hydrostatic test in conformance with NFPA 13
Fire department connections	X	X	X	See Chapter 13
Antifreeze solution	X		X	Inspect freezing point of solution Inspect for leaks at system working pressure
Alarm and Supervisory Components				
Vane-type waterflow	X	X	X	Operational test using inspector's test connection
Pressure switch–type waterflow	X	X	X	Operational test using the inspector's test connection or alarm bypass test valve
Water motor gong	X	X	X	Operational test using inspector's test connection
High and low air pressure switch	X	X	X	Operational test of high and low settings
Valve supervisory signal initiating device	X	X	X	Test for conformance with NFPA 13 and/or *NFPA 72*
Detection system (for deluge or preaction system)	X	X	X	Operational test for conformance with NFPA 13 and/or *NFPA 72*
Status-Indicating Components				
Gauges			X	Verify at 0 bar (0 psi) and system working pressure
Testing and Maintenance Components				
Air compressor	X	X	X	Operational test for conformance with NFPA 13
Automatic air maintenance device	X	X	X	Operational test for conformance with NFPA 13
Main drain	X	X	X	Main drain test
Auxiliary drains	X	X	X	Inspect for leaks at system working pressure; main drain test
Inspector's test connection	X	X	X	Inspect for leaks at system working pressure; main drain test
Structural Components				
Hanger/seismic bracing	X	X	X	Inspect for conformance with NFPA 13
Pipe stands	X	X	X	Inspect for conformance with NFPA 13
Informational Components				
Identification signs	X	X	X	Inspect for conformance with NFPA 13 and this standard
Hydraulic design information sign	X	X	X	Inspect for conformance with NFPA 13 and this standard
General information sign	X	X	X	Inspect for conformance with this standard

C. Automatic Wet Sprinkler Systems

In addition to A above, the following is required for wet sprinkler systems.

C1. Alarm Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.1.1*	NYS Quarterly	Alarm valves and system riser check valves shall be externally inspected quarterly and shall verify the following: (1) The gauges indicate normal supply water pressure is being maintained. (2) The valves and trim are free of physical damage. (3) All valves are in the appropriate open or closed position. (4) The retarding chamber or alarm drains are not leaking.	PA 4003
NFPA 25 2011 13.4.1.1*	NJ NYC Monthly	Alarm valves and system riser check valves shall be externally inspected monthly and shall verify the following: (1) The gauges indicate normal supply water pressure is being maintained. (2) The valve is free of physical damage. (3) All valves are in the appropriate open or closed position. (4) The retarding chamber or alarm drains are not leaking	PA 4003
NFPA 25 2017 A.13.4.1.1		A higher pressure reading on the system gauge is normal in variable pressure water supplies. Pressure over 175 psi (12.1 bar) can be caused by fire pump tests or thermal expansion and should be investigated and corrected.	
NFPA 25 2017 13.4.1.2*	5 Years	Alarm valves and their associated strainers, filters, and restriction orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.	PA 4004
NFPA 25 2017 A.13.4.1.2		The system should be drained for internal inspection of valve components as follows: (1) Close the control valve (2) Open the main drain valve (3) Open the inspector's test valve (4) Wait for the sound of draining water to cease and for all gauges to indicate 0 psi (0 bar) before removing the handhole cover or dismantling any component	

C2. Alarm Valves — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.1.3.1	5 Years	Internal components shall be cleaned/repaired as necessary in accordance with the manufacturer's instructions.	PA 4004
NFPA 25 2017 13.4.1.3.2		The system shall be returned to service in accordance with the manufacturer's instructions.	

C3. Antifreeze Systems — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 5.3.3*	Annually	Antifreeze Systems. Annually, before the onset of freezing weather, the antifreeze solution shall be tested using the following procedure: (1) Using the antifreeze information sign required by 4.1.10, installation records, maintenance records, information from the owner, chemical tests, or other reliable sources of information, the type of antifreeze in the system shall be determined and (a) or (b) implemented if necessary: (a) If the antifreeze is found to be a type that is no longer permitted, the system shall be drained completely and the antifreeze replaced with an acceptable solution. (b) If the type of antifreeze cannot be reliably determined, the system shall be drained completely and the antifreeze replaced with an acceptable solution in accordance with 5.3.3.4.	PA 4011

		(2) If the antifreeze is not replaced in accordance with 5.3.3(1)(a) and 5.3.3(1)(b), test samples shall be taken at the top of each system and at the bottom of each system as follows: (a) If the most remote portion of the system is not near the top or the bottom of the system, an additional sample shall be taken at the most remote portion. (b) If the connection to the water supply piping is not near the top or the bottom of the system, an additional sample shall be taken at the connection to the water supply. (3) The specific gravity of each solution shall be checked using a hydrometer with a suitable scale or a refractometer having a scale calibrated for the antifreeze solution. (4) If any of the samples exhibits a concentration in excess of what is permitted by 5.3.3.4, the system shall be emptied and refilled with a new acceptable solution. (5) If a concentration greater than what is currently permitted by 5.3.3.4 was necessary to keep the fluid from freezing, alternative methods for preventing the pipe from freezing shall be employed.	
NFPA 25-2017 A.5.3.3		Sampling from the top and bottom of the system helps to determine if the solution has settled. Antifreeze solutions are heavier than water. If the antifreeze compound is separating from the water due to poor mixing, it will exhibit a higher concentration in the lower portion of the system than in the upper portion of the system. If the concentration is acceptable near the top, but too low near the water connection, it might mean that the system is becoming diluted near the water supply. If the concentration is either too high or too low in both the samples, it might mean that the wrong concentration was added to the system. Two or three times during the freezing season, test samples can be drawn from test valve B as shown in Figure 7.6.2.1(1) of NFPA 13, especially if the water portion of the system has been drained for maintenance or repairs. A small hydrometer can be used so that a small sample is sufficient. Where water appears at valve B, or where the sample indicates that the solution has become weakened, the entire system should be emptied and refilled with acceptable solution as previously described. See Figure A.5.3.3 for expected minimum air temperatures in 48 of the United States and parts of Canada where the lowest one-day mean temperature can be used as one method of determining the minimum reasonable air temperature. In situations where the piping containing the antifreeze solution is protected in some way from exposure to the outside air, higher minimum temperatures can be anticipated. Where systems are drained in order to be refilled, it is not typically necessary to drain drops. Most systems with drops have insufficient volume to cause a problem, even if slightly higher concentration solutions collect in the drops. For drops in excess of 36 in. (915 mm), consideration should be given to draining drops if there is evidence that unacceptably high concentrations of antifreeze have collected in these long drops. When emptying and refilling antifreeze solutions, every attempt should be made to recycle the old solution with the antifreeze manufacturer rather than discard it. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25-2017 5.3.3.3.1*		Listed CPVC sprinkler pipe and fittings shall be protected from freezing with glycerine only.	
NFPA 25-2017 A.5.3.3.3.1		Where inspecting antifreeze systems employing listed CPVC piping, the solution should be verified to be glycerine based.	
NFPA 25-2017 5.3.3.3.1.1		The use of diethylene, ethylene, or propylene glycols shall be specifically prohibited.	
NFPA 25-2017 5.3.3.3		The use of antifreeze solutions shall be in conformity with state and local health regulations.	
NFPA 25-2017 5.3.3.4		Except as permitted by 5.3.3.4.1 and 5.3.3.4.3, all antifreeze systems shall utilize listed antifreeze solutions.	
NFPA 25-2017 5.3.3.4.1*		For systems installed prior to September 30, 2012, listed antifreeze solutions shall not be required until September 30, 2022, where one of the following conditions is met: (1) * The concentration of the antifreeze solution shall be limited to 30 percent propylene glycol by volume or 38 percent glycerine by volume. (2) * Antifreeze systems with concentrations in excess of 30 percent but not more than 40 percent propylene glycol by volume and 38 percent but not more than 50 percent glycerine by volume shall be permitted based upon an approved deterministic risk	

		assessment prepared by a qualified person approved by the authority having jurisdiction.	
NFPA 25-2017 A.5.3.3.4.1		All antifreeze systems installed after September 30, 2012, are assumed to meet the minimum requirements of NFPA 13, 2013 edition. For systems installed after September 30, 2012, that do not meet the requirements of the 2013 edition of NFPA 13, consideration should be given to applying 5.3.3.4.1.	
NFPA 25-2017 A.5.3.3.4.1(1)		The use of factory premixed solutions is required because solutions that are not mixed properly have a possibility of separating from the water, allowing the pure concentrate (which is heavier than water) to drop out of solution and collect in drops or low points of the system. Such concentrations are combustible and could present problems during fires. The properties of glycerine are shown in Table A.5.3.3.4.1(1).	
NFPA 25-2017 A.5.3.3.4.1(2)		Antifreeze solutions with a maximum concentration of 38 percent glycerine or 30 percent propylene glycol do not require a deterministic hazard analysis. The risk assessment should be prepared by individual(s) who can demonstrate an ability to prepare a risk assessment by education and experience and who can demonstrate an understanding of the issues associated with antifreeze sprinkler systems, including the available related fire tests. For additional information regarding the risk assessment process, documentation to be submitted, and the AHJ's role, refer to NFPA 551 and the SFPE Engineering Guide: Fire Risk Assessment. Propylene glycol and glycerine antifreeze solutions discharged from sprinklers have the potential to ignite under certain conditions. Research testing has indicated that several variables might influence the potential for large-scale ignition of the antifreeze solution discharged from a sprinkler. These variables include, but are not limited to, the concentration of antifreeze solution, sprinkler discharge characteristics, inlet pressure at the sprinkler, ceiling height, and size of fire at the time of sprinkler discharge. All relevant data and information should be carefully reviewed and considered in the deterministic risk assessment. As appropriate, the risk assessment should consider factors such as the following: (1) Occupancy use group per NFPA 13 (2) Ceiling height (3) Antifreeze solution concentration and type (4) Maximum system pressure (normal static pressures) (5) Sprinkler type, including K-factor (6) Potential and actual fuel load (Christmas trees) (7) Type of structure (construction types) (8) Size of structure (9) Ability of the sprinkler system to control the fire (10) Occupied spaces versus unoccupied spaces such as trash enclosures and dust collectors as follows: (a) Adjacent occupancies (spaces adjacent to the area protected by antifreeze systems) (b) Separation between areas protected with an antifreeze system and other areas (c) Ventilation of areas protected with an antifreeze system to prevent damage to adjacent areas (d) Duration of antifreeze discharge Tests summarized in Table A.5.3.3.4.1(2) show that largescale ignition of the sprinkler spray did not occur in tests with 50 percent glycerine and 40 percent propylene glycol antifreeze solutions discharging onto a fire having a nominal heat release rate (HRR) of 1.4 MW. A deterministic risk assessment that demonstrates that the heat release rate for reasonably credible fire scenarios will be less than 1.4 MW at the time of sprinkler activation should be acceptable. The risk assessment should also address issues associated with management of change, such as change in occupancy and temporary fuel loads. A natural Christmas tree can result in an HRR well above 1.4 MW at the time of sprinkler activation. In addition to the variables identified previously, the deterministic risk assessment should include occupancy, quantity of solution, impact on life safety, and potential increase in heat release rate. The following is a list of research reports that have been issued by the Fire Protection Research Foundation (FPRF) related to the use of antifreeze in sprinkler systems that should be considered in the development of the deterministic risk assessment: (1) Antifreeze Systems in Home Fire Sprinkler Systems — Literature Review and Research Plan, Fire Protection Research Foundation, June 2010. (2) Antifreeze Systems in Home Fire Sprinkler Systems — Phase II Final Report, Fire Protection Research Foundation, December 2010. (3) Antifreeze Solutions Supplied through Spray Sprinklers — Interim Report, Fire Protection Research Foundation, February 2012.	

		Table A.5.3.3.4.1(2) provides an overview of the testing conducted by the FPRF.	
NFPA 25-2017 5.3.3.4.3		Premixed antifreeze solutions of propylene glycol exceeding 30 percent concentration by volume shall be permitted for use with ESFR sprinklers where the ESFR sprinklers are listed for such use in a specific application.	
NFPA 25-2017 5.3.3.1		The antifreeze solution shall be tested at its most remote portion and where it interfaces with the wet pipe system.	
NFPA 25-2017 5.3.3.2		Where antifreeze systems have a capacity larger than 150 gal (568 L), tests at one additional point for every 100 gal (379 L) shall be made.	
NFPA 25-2017 5.3.3.2.1		If the results indicate an incorrect freeze point at any point in the system, the system shall be drained and refilled with new premixed antifreeze.	
NFPA 25-2017 5.3.3.2.2		For premixed solutions, the manufacturer's instructions shall be permitted to be used with regard to the number of test points and the refill procedure.	
NFPA 25-2017 5.3.3.4.2		Newly introduced solutions shall be factory premixed antifreeze solutions (chemically pure or United States Pharmacopeia 96.5 percent).	

C4. Building Heating System — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 4.1.2*		Freeze Protection. The property owner or designated representative shall ensure that water-filled piping is maintained at a minimum temperature of 40°F (4°C) unless an approved antifreeze solution is utilized.	PA 4014
NFPA 25-2017 A.4.1.2		In areas that have the potential for freezing temperatures below the level that can be adequately protected by an allowable antifreeze solution, supplemental heat can be provided when temperatures fall below the level of the antifreeze solution. Other means of freeze protection for water-filled piping, including heated valve enclosures, heat tracing, insulation, or other methods, are allowed by the applicable installation standard. Installation standards require heat tracing protecting fire protection piping against freezing to be supervised.	
NFPA 25-2017 4.1.2.1		All areas of the building containing water-filled piping that does not have another means of freeze protection shall be maintained at a minimum temperature of 40°F (4.0°C).	
NFPA 25-2017 4.1.2.2		Aboveground water-filled pipes that pass through open areas, cold rooms, passageways, or other areas exposed to temperatures below 40°F (4.0°C), protected against freezing by insulating coverings, frostproof casings, listed heat tracing systems, or other reliable means, shall be maintained at temperatures between 40°F (4.0°C) and 120°F (48.9°C).	
NFPA 25-2017 4.1.2.3		Where other approved means of freeze protection for water-filled piping as described in 4.1.2.2 are utilized, they shall be inspected, tested, and maintained in accordance with this standard.	

D. Automatic Dry Pipe Sprinkler Systems

In addition to A above, the following is required for dry pipe sprinkler systems.

D1. Valve Enclosure — Inspection

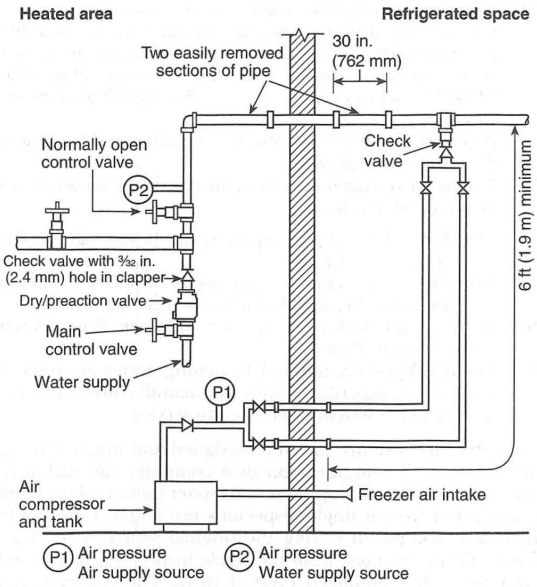
Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 13.4.5.1.1	Daily	Valve enclosures subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C).	PA 4007
NFPA 25-2017 13.4.5.1.1.1	Weekly	Valve enclosures equipped with low temperature alarms shall be inspected weekly.	PA 4007
NFPA 25-2017 13.4.5.1.1.2	Annually	Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.	PA 4007

D2. Alarm Devices — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 13.4.5.2.7	Annually	Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.	PA 4006
NFPA 25-2017 13.4.5.2.6*	Annually	Low air pressure alarms, if provided, shall be tested annually in accordance with the manufacturer's instructions.	PA 4006
NFPA 25-2017 A.13.4.5.2.6		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 72-2016 Table 14.4.3.2-17(j)(2)	Annually	High- or low-air pressure switch - 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.	PA 4006

D3. Air Pressure Gauges — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2011 13.4.4.1.2	NYC Weekly	Gauges shall be inspected weekly.	PA 4001
NFPA 25 2014 13.4.4.1.2.5	NJ NYC Weekly	Gauges on systems other than those with low air or nitrogen pressure alarms shall be inspected weekly.	PA 4001
NFPA 25 2011 13.4.4.1.2.4	NJ NYC Monthly	Gauges on systems with low air or nitrogen pressure alarms shall be inspected monthly.	PA 4001
NFPA 25 2017 13.2.7.1.3	NYS Monthly	Gauges monitoring air or nitrogen pressure shall be inspected monthly to verify that normal air or nitrogen pressure are being maintained.	PA 4001
NFPA 25 2017 13.2.7.1.3.1		The gauge on the quick-opening device, if provided, shall indicate the same pressure as the gauge on the system side of the dry pipe valve.	
NFPA 25 2017 13.2.7.1.3.2	NYS Quarterly	Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected quarterly.	PA 4001
NFPA 25 2017 13.2.7.1.4*	Monthly	For dry pipe or preaction systems protecting freezers with an air pressure gauge(s) on the air line(s) between the compressor and the dry pipe or preaction valve, the air pressure gauge near the compressor shall be compared monthly to the pressure gauge above the dry pipe or preaction valve.	PA 4001

NFPA 25 2017 A.13.2.7.1.4		See Figure A.13.2.7.1.4.  Notes: 1. Check valve with 3/32 in. (2.4 mm) hole in clapper not required if prime water not used. 2. Supply air to be connection to top or side of system pipe. 3. Each removable air line should be a minimum of 1 in. (25 mm) diameter and minimum of 6 ft (1.9 m) long. **FIGURE A.13.2.7.1.4 Refrigerator Area Sprinkler System Used to Minimize Chances of Developing Ice Plugs.**	
NFPA 25 2017 13.2.7.1.4.1		When the gauge near the compressor is reading higher than the gauge near the dry pipe valve, the air line in service shall be taken out of service and the alternate air line shall be opened to equalize the pressure.	
NFPA 25 2017 13.2.7.1.4.2		An air line taken out of service in accordance with 13.2.7.1.4.1 shall be internally inspected, removed of all ice blockage, and reassembled for use as a future alternate air line.	

D4. Dry Pipe Valve — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.5.1.3	Monthly	The dry pipe valve shall be externally inspected monthly to verify the following: (1) The valve is free of physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The intermediate chamber is not leaking.	PA 4003
NFPA 25 2017 13.4.5.1.4	Annually	The interior of the dry pipe valve shall be inspected annually when the trip test is conducted.	PA 4004

D5. Dry Pipe System — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.5.2.1*	Quarterly	The priming water level shall be tested quarterly.	PA 4011

NFPA 25 2017 A.13.4.5.2.1		High priming water levels can affect the operation of supervisory air or nitrogen pressure maintenance devices. Test the water level as follows: (1) Open the priming level test valve. (2) If water flows, drain it. (3) Close the valve when water stops flowing and air discharges. (4) If air discharges when the valve is opened, the priming water level could be too low. To add priming water, refer to the manufacturer's instructions.	
NFPA 25 2017 13.4.5.2.2*	Annually	Each dry pipe valve shall be trip tested annually during warm weather.	PA 4012
NFPA 25 2017 A.13.4.5.2.2		Dry pipe valves should be trip tested in the spring to allow time before the onset of cold weather for all water that has entered the system or condensation to drain to low points or back to the valve. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.4.5.2.2.1		Dry pipe valves protecting freezers shall be trip tested in a manner that does not introduce moisture into the piping in the freezers.	
NFPA 25 2017 13.4.5.2.2.2*	3 Years	Every 3 years and whenever the system is altered, the dry pipe valve shall be trip tested with the control valve fully open and the quick-opening device, if provided, in service.	PA 4012
NFPA 25 2017 A.13.4.5.2.2.2		A full flow trip test generally requires at least two individuals, one of whom is situated at the dry pipe valve while the other is at the inspector's test. If possible, they should be in communication with each other. A full flow trip test is conducted as follows: (1) The main drain valve is fully opened to clean any accumulated scale or foreign material from the supply water piping. The main drain valve then is closed. (2) The system air or nitrogen pressure and the supply water pressure are recorded. (3) The system air or nitrogen pressure is relieved by opening the inspector's test valve completely. Concurrent with opening the valve, both testers start their stopwatches. If two-way communication is not available, the tester at the dry valve is to react to the start of downward movement on the air pressure gauge. (4) Testers at the dry pipe valve note the air pressure at which the valve trips and note the tripping time. (5) Testers at the inspector's test note the time at which water flows steadily from the test connection. This time is noted for comparison purposes to previous tests and is not meant to be a specific pass/fail criterion. Note that NFPA 13 does not require water delivery in 60 seconds for all systems. (6) When clean water flows, the test is terminated by closing the system control valve. (7) The air or nitrogen pressure and the time elapsed are to be recorded as follows: a) From the complete opening of the test valve to the tripping of the valve b) From the complete opening of inspector's valve to the start of steady flow from the test connection (8) All low-point drains are opened and then closed when water ceases to flow. (9) The dry pipe valve and quick-opening device are reset, if installed, in accordance with the manufacturer's instructions, and the system is returned to service. For dry pipe systems that were designed and installed using either a manual demonstration or a computer calculation to simulate multiple openings to predict water delivery time, a full flow trip test from a single inspector's test connection should have been conducted during the original system acceptance and a full flow trip test from the single inspector's test should continue to be conducted every 3 years. The system is not required to achieve water delivery to the inspector's test connection in 60 seconds, but comparison to the water delivery time during the original acceptance will determine if there is a problem with the system.	PA 4012
NFPA 25 2017 13.4.5.2.2.3*	Alternate Years	During those years when full flow testing in accordance with 13.4.5.2.2.2 is not required, each dry pipe valve shall be trip tested with the control valve partially open.	PA 4012
NFPA 25 2017 A.13.4.5.2.2.3		A partial flow trip test is conducted in the following manner: (1) Fully open the main drain valve to clean any accumulated scale or foreign material from the supply water piping. (2) Close the control valve to the point where additional closure cannot provide flow through the entire area of the drain outlet. (3) Close the valve controlling flow to the device if a quick-opening device is installed. (4) Record the system air or nitrogen pressure and the supply water pressure. (5) Relieve system air or nitrogen pressure by opening the priming level test valve or the inspector's test valve. (6) Note and record the air or nitrogen pressure, and supply water pressure when the dry pipe valve trips.	

		(7) Immediately close the system control valve, and open the main drain valve to minimize the amount of water entering the system piping. (8) Trip test the quick-opening device, if installed, in accordance with the manufacturer's instructions. (9) Open all low point drains, and close them when water ceases to flow. (10) Reset the dry pipe valve and quick-opening device, if installed, in accordance with the manufacturer's instructions, and return the system to service. CAUTION: A partial flow trip test does not provide a high enough rate of flow to latch the clappers of some dry pipe valve models in the open position. When resetting such valves, check that the latching equipment is operative.	
NFPA 25 2017 13.4.5.2.2.4		When refilling a dry system, the air supply shall be capable of restoring normal air pressure in the system within 30 minutes.	
NFPA 25 2017 13.4.5.2.2.5		The requirements of 13.4.5.2.2.4 shall not apply in refrigerated spaces maintained below 5°F (–15°C), where normal system air pressure shall be permitted to be restored within 60 minutes.	
NFPA 25 2017 13.4.5.2.3		Grease or other sealing materials shall not be applied to the seating surfaces of dry pipe valves.	
NFPA 25 2017 13.4.5.2.4*	Quarterly	Quick-opening devices, if provided, shall be tested quarterly.	PA 4012
NFPA 25 2017 A.13.4.5.2.4		Except when a full flow trip test is conducted in accordance with A.13.4.5.2.2.2, a quick-opening device should be tested in the following manner: (1) Close the system control valve (2) Open the main drain valve, and keep it in the open position (3) Verify that the quick-opening device control valve is open (4) Open the inspector's test valve. (Note that a burst of air from the device indicates that it has tripped) (5) Close the device's control valve (6) Return the device to service in accordance with the manufacturer's instructions and return the system to service. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.4.5.2.5		A tag or card that shows the date on which the dry pipe valve was last tripped, and the name of the person and organization conducting the test, shall be attached to the valve.	
NFPA 25 2017 13.4.5.2.5.1		Separate records of initial air and water pressure, tripping air pressure, and dry pipe valve operating conditions shall be maintained on the premises for comparison with previous test results.	
NFPA 25 2017 13.4.5.2.5.2		Records of dry pipe valve tripping time and water transit delivery time to the inspector's test connection shall be maintained for full flow trip tests.	
NFPA 25 2017 13.4.5.2.9*	3 Years	Dry pipe systems shall be tested once every 3 years for gas leakage, using one of the following test methods: (1) A gas (air or nitrogen) pressure test at 40 psi (3.2 bar) shall be performed for 2 hours. (a) The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. (b) Gas leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test. (2) With the system at normal system pressure, the gas source (nitrogen supply, compressor, or shop air) shall be shut off for 4 hours. If the low pressure alarm goes off within this period, the leaks shall be addressed	PA 4012
NFPA 25 2017 A.13.4.5.2.9		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	

D6. Dry-Pipe System Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.5.3.1	Annually	During the annual trip test, the interior of the dry pipe valve shall be cleaned thoroughly, and parts replaced or repaired as necessary.	PA 4004
NFPA 25 2017 13.4.5.3.2*	As Required	Auxiliary drains in dry pipe sprinkler systems shall be drained after each operation of the system, before the onset of freezing weather conditions, and thereafter as needed.	
NFPA 25 2017 A.13.4.5.3.2		Removing water from a dry system is an essential part of a good maintenance program. Failure to keep the dry system free of water can result in damage and expensive repairs to both the system and building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after	

		a dry sprinkler system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily with the frequency of operation decreasing depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry. A quick-opening device, if installed, should be removed temporarily from service prior to draining low points.	
NFPA 25 2017 5.4.2*		Dry Pipe Systems. Dry pipe systems shall be kept dry at all times.	
NFPA 25 2017 A.5.4.2		Conversion of dry pipe systems to wet pipe systems on a seasonal basis causes corrosion and accumulation of foreign matter in the pipe system and loss of alarm service.	
NFPA 25 2017 5.4.2.3		Air driers shall be maintained in accordance with the manufacturer's instructions.	

D7. Air Pressure Maintenance Devices Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 5.4.2.4		Compressors used in conjunction with dry pipe sprinkler systems shall be inspected, tested, and maintained in accordance with Chapter 13 and the manufacturer's instructions.	
NFPA 25 2017 13.10.1		Air compressors dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with 13.10.2, 13.10.3, and 13.10.4.	
NFPA 25 2017 13.10.1.1		Air compressors not dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.2.1	Monthly	Air compressors dedicated to water-based fire protection systems shall be inspected monthly to verify the following: (1) Air compressor is free of physical damage. (2) Power wiring to the air compressor is intact and free of physical damage. (3) Piping from the air compressor to the fire protection system is intact and free of physical damage. (4) The means of anchoring the air compressor to the structure or to the system piping is secure, tight, and free of physical damage. (5) Air compressors requiring oil have the required amount of oil in the oil reservoir.	PA 4007
NFPA 25 2017 13.10.3.1	Annually	Air compressors dedicated to water-based fire protection systems shall be tested annually to verify the following: (1) Air compressor operates as intended on the proper drop of air pressure in the fire protection system. (2) Air compressor restores normal air pressure in the fire protection system in the required time frame. (3) Air compressor does not overheat while running.	PA 4007
NFPA 25 2017 13.4.5.2.8	Annually	Automatic air pressure maintenance devices, if provided, shall be tested annually during the dry pipe valve trip test in accordance with the manufacturer's instructions.	PA 4007
NFPA 25 2017 13.10.4.1		Air compressors dedicated to water-based fire protection systems shall be maintained in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.4.2	Annually	Compressors requiring oil shall have the oil replaced on an annual basis unless the manufacturer's instructions require more frequent replacement.	PA 4007

E. Automatic Preaction Sprinkler Systems

In addition to A above, the following is required for preaction sprinkler systems.

E1. Valve Enclosure — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.1.1	Daily	Valve enclosures for preaction valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C).	PA 4007
NFPA 25 2017 13.4.3.1.1.1	Weekly	Valve enclosures equipped with low temperature alarms shall be inspected weekly.	PA 4007
NFPA 25 2017 13.4.3.1.2	Annually	Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.	PA 4007

E2. Valve Enclosure — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.2.11	Annually	Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.	PA 4007

E3. Preaction Valve — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.1.3	Monthly	The preaction valve shall be externally inspected monthly to verify the following: (1) The valve is free from physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The valve seat is not leaking. (4) Electrical components are in service	PA 4003
NFPA 25 2017 13.4.3.1.4	Annually	The interior of the preaction valve and the condition of detection devices shall be inspected annually when the trip test is conducted.	PA 4004
NFPA 25 2017 13.4.3.1.4.1	5 Years	Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.	PA 4004
NFPA 25 2017 13.4.3.1.5	5 Years	Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.	PA 4004
NFPA 25 2017 13.4.3.1.6		Preaction systems with auxiliary drains shall require a sign at the valve indicating the number of auxiliary drains and the location of each individual drain.	

E4. Preaction System — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.2.1*	Quarterly	The priming water level in supervised preaction systems shall be tested quarterly for compliance with the manufacturer's instructions.	PA 4011
NFPA 25 2017 A.13.4.3.2.1		High priming water levels can adversely affect the operation of supervisory air. Test the water level as follows: (1) Open the priming level test valve. (2) If water flows, drain it. (3) Close the valve when water stops flowing and air discharges. (4) If air discharges when the valve is opened, the priming water level could be too low. To add priming water, refer to the manufacturer's instructions.	
NFPA 25 2017 13.4.3.2.10	Quarterly	Low air pressure alarms, if provided, shall be tested quarterly in accordance with the manufacturer's instructions.	PA 4006

NFPA 25 2017 13.4.3.2.2	3 Years	Except for preaction systems covered by 13.4.3.2.4, every 3 years the preaction valve shall be trip tested with the control valve fully open.	PA 4013
NFPA 25 2017 13.4.3.2.3	Alternate Years	During those years when full flow testing in accordance with 13.4.3.2.2 is not required, the preaction valve shall be trip tested with the control valve partially open.	PA 4013
NFPA 25 2017 13.4.3.2.4		Preaction valves protecting freezers shall be trip tested in a manner that does not introduce moisture into the piping in the freezer.	
NFPA 25 2017 13.4.3.2.5	3 Years	Preaction systems shall be tested once every 3 years for air leakage, using one of the following test methods: (1) Perform a pressure test at 40 psi (3.2 bar) for 2 hours. The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test. (2) With the system at normal system pressure, shut off the air source (compressor or shop air) for 4 hours. If the low air pressure alarm goes off within this period, the air leaks shall be addressed.	PA 4013
NFPA 25 2017 13.4.3.2.6*	Annually	Manual Operation. Manual actuation devices shall be operated annually.	PA 4013
NFPA 25 2017 A.13.4.3.2.6		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.4.3.2.7		Return to Service. After the annual trip test, the preaction system shall be returned to service in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.4.3.2.8		Grease or other sealing materials shall not be applied to the seating surfaces of preaction valves.	
NFPA 25 2017 13.4.3.2.9*		Records indicating the date the preaction valve was last tripped and the tripping time, as well as the individual and organization conducting the test, shall be maintained at a location or in a manner readily available for review by the authority having jurisdiction.	
NFPA 25 2017 A.13.4.3.2.9		Methods of recording maintenance include tags attached at each riser, records retained at each building, and records retained at one building in a complex.	

E5. Preaction System Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.3.1	As Required	Leaks causing drops in supervisory pressure sufficient to sound warning alarms and electrical malfunctions causing alarms to sound shall be located and repaired.	
NFPA 25 2017 13.4.3.3.2	Annually	During the annual trip test, the interior of the preaction valve shall be cleaned thoroughly and the parts replaced or repaired as necessary.	PA 4004
NFPA 25 2017 13.4.3.3.2.1	5 Years	Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.	PA 4004
NFPA 25 2017 13.4.3.3.3*	Annually and As Needed	Auxiliary drains in preaction systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).	PA 4014
NFPA 25 2017 A.13.4.3.3.3		Suitable facilities should be provided to dispose of drained water. Low points equipped with a single valve should be drained as follows: (1) Open the low-point drain valve slowly. (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve. (3) Repeat this procedure until water ceases to discharge. (4) Replace plug or nipple and cap as necessary. Low points equipped with dual valves should be drained as follows: (1) Close the upper valve. (2) Open the lower valve, and drain the accumulated water. (3) Close the lower valve, open the upper valve, and allow time for additional water accumulation. (4) Repeat this procedure until water ceases to discharge. (5) Replace plug or nipple and cap in lower valve. Removing water from a deluge system is an essential part of a good maintenance program. Failure to keep these systems free of water can result in damage and expensive repairs to both the system and the building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after a system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals, depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily, with the frequency of operation decreasing	

		depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry.	
NFPA 25 2017 13.4.3.3.4	As Required	Additional maintenance as required by the manufacturer's instructions shall be provided.	

E6. Air Pressure Maintenance Devices — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.2.12	Annually	Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction valve trip test, in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.1		Air compressors dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with 13.10.2, 13.10.3, and 13.10.4.	
NFPA 25 2017 13.10.1.1		Air compressors not dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.2.1	Monthly	Air compressors dedicated to water-based fire protection systems shall be inspected monthly to verify the following: (1) Air compressor is free of physical damage. (2) Power wiring to the air compressor is intact and free of physical damage. (3) Piping from the air compressor to the fire protection system is intact and free of physical damage. (4) The means of anchoring the air compressor to the structure or to the system piping is secure, tight, and free of physical damage. (5) Air compressors requiring oil have the required amount of oil in the oil reservoir.	PA 4007
NFPA 25 2017 13.10.3.1	Annually	Air compressors dedicated to water-based fire protection systems shall be tested annually to verify the following: (1) Air compressor operates as intended on the proper drop of air pressure in the fire protection system. (2) Air compressor restores normal air pressure in the fire protection system in the required time frame. (3) Air compressor does not overheat while running.	PA 4007
NFPA 25 2017 13.4.3.2.12	Annually	Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction valve trip test, in accordance with the manufacturer's instructions.	PA 4007
NFPA 25 2017 13.10.4.1		Air compressors dedicated to water-based fire protection systems shall be maintained in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.4.2	Annually	Compressors requiring oil shall have the oil replaced on an annual basis unless the manufacturer's instructions require more frequent replacement.	PA 4007

F. Automatic Deluge Sprinkler Systems

In addition to A above, the following is required for deluge sprinkler systems.

F1. Valve Enclosure — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.1.1	Daily	Valve enclosures for deluge valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C).	PA 4007
NFPA 25 2017 13.4.4.1.1.1	Weekly	Valve enclosures equipped with low temperature alarms shall be inspected weekly.	PA 4007
NFPA 25 2017 13.4.4.1.2	Annually	Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.	PA 4007

F2. Valve Enclosure — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.2.14	Annually	Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.	PA 4007

F3. Deluge Valve — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.1.3	Monthly	The deluge valve shall be externally inspected monthly to verify the following: (1) The valve is free from physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The valve seat is not leaking. (4) Electrical components are in service.	PA 4003
NFPA 25 2017 13.4.4.1.4	Annually	The interior of the deluge valve and the condition of detection devices shall be inspected annually when the trip test is conducted.	PA 4004
NFPA 25 2017 13.4.4.1.4.1	5 Years	Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.	PA 4004
NFPA 25 2017 13.4.4.1.5	5 Years	Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.	PA 4004

F4. Deluge System — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.2.1		Deluge valve flow tests shall incorporate full functionality of the system as a unit, including automatic and manual activation.	
NFPA 25 2017 13.4.4.2.2		Protection shall be provided for any devices or equipment subject to damage by system discharge during flow tests.	
NFPA 25 2017 13.4.4.2.3*	Annually	Except as provided by 13.4.4.2.3.1 and 13.4.4.2.3.2, each deluge valve shall be trip tested annually at full flow in warm weather and in accordance with the manufacturer's instructions.	PA 4013
NFPA 25 2017 A.13.4.4.2.3		Deluge valves in areas subject to freezing should be trip tested in the spring to allow time before the onset of cold weather for all water that has entered the system or condensation to drain to low points or back to the valve.	
NFPA 25 2017 13.4.4.2.3.1*		Where the nature of the protected property is such that water cannot be discharged for test purposes, an annual trip test shall be permitted to be conducted in a manner that does not necessitate discharge in the protected area.	
NFPA 25 2017 A.13.4.4.2.3.1		It is necessary that the full flow test incorporate the full functionality of the system, which would include any solenoid valves or other actuation devices. It was a common practice in the past to	

		test the detection system or manual pull station up to the solenoid valve or actuator and to separately test the deluge valve and system after the solenoid valve or actuator. The detectors on the system can be tested separately as long as the functional test includes activation of the actuator or solenoid when it receives an actual or simulated signal.	
NFPA 25 2017 13.4.4.2.3.2		Where the nature of the protected property is such that water cannot be discharged unless protected equipment is shut down (e.g., energized electrical equipment), a full flow system test shall be conducted at the next scheduled shutdown.	
NFPA 25 2017 13.4.4.2.3.3		For full flow tests in accordance with 13.4.4.2.3.2, the test frequency shall not exceed 3 years.	
NFPA 25 2017 13.4.4.2.4		During the annual full flow test, the water discharge patterns from all of the open spray nozzles or sprinklers shall be observed to ensure that patterns are not impeded by plugged nozzles, that nozzles are correctly positioned, and that obstructions do not prevent discharge patterns from wetting surfaces to be protected.	
NFPA 25 2017 13.4.4.2.4.1		Where the nature of the protected property is such that water cannot be discharged, the nozzles or open sprinklers shall be inspected for correct orientation.	
NFPA 25 2017 13.4.4.2.4.2		Where the nature of the protected property is such that water cannot be discharged unless protected equipment is shut down (e.g., energized electrical equipment), all open spray nozzles or sprinklers shall be inspected in accordance with 13.4.4.2.4 during the full flow system test conducted at the next scheduled shutdown.	
NFPA 25 2017 13.4.4.2.4.3		Where misalignment or obstructions occur, the piping and sprinklers or nozzles shall be adjusted and/or cleaned to correct the condition, and the system shall be retested.	
NFPA 25 2017 13.4.4.2.5		Full flow deluge valve tests, in accordance with 13.4.4.2.3 and 13.4.4.2.3.2, shall be conducted with the deluge system control valve fully open.	
NFPA 25 2017 13.4.4.2.6*		Deluge valve trip tests, in accordance with 13.4.4.2.3.1, shall be permitted to be conducted with the deluge system control valve partially open.	
NFPA 25 2017 A.13.4.4.2.6		See the NFPA 25 Handbook, Water-Based Fire Protection Systems Handbook, for additional guidance related to conducting such testing procedures.	
NFPA 25 2017 13.4.4.2.8		Multiple Systems. The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply.	
NFPA 25 2017 13.4.4.2.9	Annually	Manual Operation. Manual actuation devices shall be operated annually.	PA 4013
NFPA 25 2017 13.4.4.2.10		Return to Service. After the annual trip test, the system shall be returned to service in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.4.4.2.11		Grease or other sealing materials shall not be applied to the seating surfaces of deluge valves.	
NFPA 25 2017 13.4.4.2.12*		Records indicating the date the deluge valve was last tripped and the tripping time, as well as the individual and organization conducting the test, shall be maintained at a location or in a manner readily available for review by the authority having jurisdiction.	
NFPA 25 2017 A.13.4.4.2.12		Methods of recording maintenance include tags attached at each riser, records retained at each building, and records retained at one building in a complex.	
NFPA 25 2017 13.4.4.2.13	Quarterly	Low air pressure supervisory devices, if provided on the detection system, shall be tested quarterly in accordance with the manufacturer's instructions.	PA 4006

F5. Deluge System Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.3.1	As Required	Leaks causing drops in supervisory pressure sufficient to sound warning alarms and electrical malfunctions causing alarms to sound shall be located and repaired.	
NFPA 25 2017 13.4.4.3.2	Annually	During the annual trip test, the interior of the deluge valve shall be cleaned thoroughly and the parts replaced or repaired as necessary.	PA 4004
NFPA 25 2017 13.4.4.3.2.1	5 Years	Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.	PA 4004
NFPA 25 2017 13.4.4.3.3*	Annually and As Needed	Auxiliary drains in deluge systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).	PA 4014
NFPA 25 2017 A.13.4.4.3.3		Suitable facilities should be provided to dispose of drained water. Low points equipped with a single valve should be drained as follows: (1) Open the low-point drain valve slowly. (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve. (3) Repeat this procedure until water ceases to discharge. (4) Replace plug or nipple and cap as necessary. Low points equipped with dual valves should be drained as follows: (1) Close the upper valve. (2) Open the lower valve, and drain the accumulated water.	

		(3) Close the lower valve, open the upper valve, and allow time for additional water accumulation. (4) Repeat this procedure until water ceases to discharge. (5) Replace plug or nipple and cap in lower valve. Removing water from a preaction system is an essential part of a good maintenance program. Failure to keep these systems free of water can result in damage and expensive repairs to both the system and the building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after a system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily, with the frequency of operation decreasing depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry.	
NFPA 25 2017 13.4.4.3.4	As Required	Additional maintenance as required by the manufacturer's instructions shall be provided.	

F6. Air Pressure Maintenance Devices — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.2.15	Annually	Automatic air pressure maintenance devices, if provided on the detection system, shall be tested yearly at the time of the annual deluge valve trip test, in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.1		Air compressors dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with 13.10.2, 13.10.3, and 13.10.4.	
NFPA 25 2017 13.10.1.1		Air compressors not dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.2.1	Monthly	Air compressors dedicated to water-based fire protection systems shall be inspected monthly to verify the following: (1) Air compressor is free of physical damage. (2) Power wiring to the air compressor is intact and free of physical damage. (3) Piping from the air compressor to the fire protection system is intact and free of physical damage. (4) The means of anchoring the air compressor to the structure or to the system piping is secure, tight, and free of physical damage. (5) Air compressors requiring oil have the required amount of oil in the oil reservoir.	PA 4007
NFPA 25 2017 13.10.3.1	Annually	Air compressors dedicated to water-based fire protection systems shall be tested annually to verify the following: (1) Air compressor operates as intended on the proper drop of air pressure in the fire protection system. (2) Air compressor restores normal air pressure in the fire protection system in the required time frame. (3) Air compressor does not overheat while running.	PA 4007
NFPA 25 2017 13.4.3.2.12	Annually	Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction valve trip test, in accordance with the manufacturer's instructions.	PA 4007
NFPA 25 2017 13.10.4.1		Air compressors dedicated to water-based fire protection systems shall be maintained in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.10.4.2	Annually	Compressors requiring oil shall have the oil replaced on an annual basis unless the manufacturer's instructions require more frequent replacement.	PA 4007

SPRINKLER SYSTEMS
GENERAL INFORMATION

PA 4000 / 12-20

Building ID:

System ID:

Area(s) Protected:

Original Installation Date:

General

Type of sprinkler system: (wet, dry, preaction, deluge)	
Make and model of sprinkler valve	
Location of sprinkler valve	
Is the room monitored by a low temperature alarm?	
Are all required signs provided at the control valve? Hydraulic Design Information / General Information / Information / Antifreeze / Auxilliary Drains	
Location of inspector's test point: (Wet/Dry): **Location of manual release:** (Preaction/Deluge)	
Air pressure in system: (Dry/Preaction)	
Number and Type of Initiating Devices: (Preaction/Deluge)	
Number and location of fire department connections: **Are identification signs provided?**	
Manufacturer and Model of Quick Opening Device (if provided)	

Control Valves

Number of Control Valves:	
How are valves supervised? (Sealed/Locked/Tamper Switch)	
Are valves identified with signs	

Water Supply

Water supplied from: (Municipal, fire pump, storage tank)	
Water supply pressure at the control valve	
Are valves identified with signs	
Fire Pump ID / Location	

Notes:

SPRINKLER SYSTEMS **PA 4001 / 12-20**
GAUGES – INSPECTION / TESTING

Building ID:

- Use this form to document inspection, testing of gauges.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Gauges – Inspection – Weekly/Monthly/Quarterly – {Reference C1A3} –** Identify and inspect gauges as per jurisdictional requirements to verify that they are operable and not physically damaged. Record the pressure in Notes.

2. **Air Pressure Gauges – Inspection – Weekly/Monthly/Quarterly – {Reference C1D3} –** Identify and inspect gauges that measure air, nitrogen, or any other gases in dry pipe and preaction systems. Record the pressure in Notes.

3. **Gauges – Testing – 5 Years – {Reference C1A4} –** Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge. Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.

S = Satisfactory **U = Unsatisfactory**

Gauge ID / System ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
CONTROL VALVES – INSPECTION / TESTING / MAINTENANCE

PA 4002 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of sprinkler system control valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Control Valves – Inspection – Weekly/Monthly/Quarterly – {Reference C1A5}** – Identify and inspect control valves. The valve inspection shall verify that the valves are in the following condition:
   (1) In the normal open or closed position
   (2) Sealed, locked, or supervised
   (3) Accessible
   (4) Post indicator valves (PIVs) are provided with correct wrenches
   (5) Free from external leaks
   (6) Provided with applicable identification

2. **Control Valves – Testing and Maintenance – Annually – {Reference C1A6} –** Identify and perform routine testing and maintenance of each control valve by operating through its full range and returning to its normal position. Lubricate operating stems of outside screw and yoke valves.

3. **Control Valve – Supervisory Devices – Inspection – Quarterly – {Reference C1A7} –** Identify and inspect control valve supervisory alarm devices to verify that they are free of physical damage.

4. **Control Valve – Supervisory Devices – Testing – SemiAnnually – {Reference C1A8}** – Identify and test valve supervisory switches demonstrating a distinctive signal when the valve is moved from its normal position.

S = Satisfactory **U = Unsatisfactory**

Control Valve ID/System ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
VALVES – EXTERIOR INSPECTIONS

PA 4003 / 12-20

Building ID:

- Use this form to document inspections of sprinkler valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Alarm Valves – Exterior Inspection – Monthly/Quarterly – {Reference C1C1}** – Externally inspect alarm valves and system riser check valves to verify the following:
   (1) The gauges indicate normal supply water pressure is being maintained.
   (2) The valves and trim are free of physical damage.
   (3) All valves are in the appropriate open or closed position.
   (4) The retarding chamber or alarm drains are not leaking.

2. **Dry Pipe Valve – Exterior Inspection – Monthly – {Reference C1D4} –** Externally inspect the dry pipe valve to verify the following:
   (1) The valve is free of physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The intermediate chamber is not leaking.

3. **Preaction Valve – Exterior Inspection – Monthly – {Reference C1E3}** – Externally inspect the dry pipe valve to verify the following:
   (1) The valve is free from physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The valve seat is not leaking.
   (4) Electrical components are in service

4. **Deluge Valve – Exterior Inspection – Monthly – {Reference C1F3} –** The deluge valve shall be externally inspected monthly to verify the following:
   (1) The valve is free from physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The valve seat is not leaking.
   (4) Electrical components are in service.

S = Satisfactory **U = Unsatisfactory**

Valve ID / System ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
VALVES – INTERIOR INSPECTIONS / MAINTENANCE

PA 4004 / 12-20

Building ID:

- Use this form to document inspections and maintenance of sprinkler valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Alarm Valves – Interior Inspection – 5 Years – {Reference C1C1} –** Alarm valves and their associated strainers, filters, and restriction orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary. The system should be drained for internal inspection of valve components as follows:
   (1) Close the control valve
   (2) Open the main drain valve
   (3) Open the inspector's test valve
   (4) Wait for the sound of draining water to cease and for all gauges to indicate 0 psi (0 bar) before removing the handhole cover or dismantling any component

2. **Alarm Valves – Maintenance – 5 Years – {Reference C1C2} –** Internal components shall be cleaned/repaired as necessary in accordance with the manufacturer's instructions.

3. **Dry Pipe Valve – Interior Inspection – Annually – {Reference C1D4} –** The interior of the dry pipe valve shall be inspected annually when the trip test is conducted.

4. **Dry Pipe Valve – Maintenance – Annually – {Reference C1D6} –** During the annual trip test, the interior of the dry pipe valve shall be cleaned thoroughly, and parts replaced or repaired as necessary.

5. **Preaction Valve – Interior Inspection – Annually/5 Years – {Reference C1E3} –** The interior of the preaction valve and the condition of detection devices shall be inspected annually when the trip test is conducted. Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.

6. **Preaction Valve – Maintenance – Annually/5 Years – {Reference C1E5} –** During the annual trip test, the interior of the preaction valve shall be cleaned thoroughly and the parts replaced or repaired as necessary. Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.

7. **Deluge Valve – Interior Inspection – Annually/5 Years – {Reference C1F3} –** The interior of the deluge valve and the condition of detection devices shall be inspected annually when the trip test is conducted. Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.

8. **Deluge Valve – Maintenance – Annually/5 Years – {Reference C1F3} –** During the annual trip test, the interior of the deluge valve shall be cleaned thoroughly and the parts replaced or repaired as necessary. Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.

9. **Strainers, Filters, Restricted Orifices, Diaphragm Chambers – Inspection – 5 Years – {Reference C1D3, C1F3} –** Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.

S = Satisfactory **U = Unsatisfactory**

Valve ID / System ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
PRESSURE REDUCING VALVES – INSPECTION / TESTING

PA 4005 / 12-20

Building ID:

- Use this form to document inspections, testing of pressure reducing & relief valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Pressure Reducing & Relief Valves – Inspection – Quarterly – {Reference C1A9}** – All valves shall be inspected quarterly to verify that the valves are in the following condition:
   (1) In the open position
   (2) Not leaking
   (3) Maintaining downstream pressures in accordance with the design criteria
   (4) Handwheels installed and unbroken

2. **Pressure Reducing & Relief Valves – Testing/Maintenance – Annually – {Reference C1A10} –** A partial flow test adequate to move the valve from its seat shall be conducted annually.

3. **Pressure Reducing & Relief Valves – Testing/Maintenance – 5 Years – {Reference C1A10}** – A full flow test shall be conducted on each valve at 5-year intervals and shall be compared to previous test results.

S = Satisfactory **U = Unsatisfactory**

Valve ID / System ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
ALARM DEVICES – INSPECTION / TESTING

PA 4006 / 12-20

Building ID:

- Use this form to document inspection, testing of alarm devices.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Alarm Devices – Inspection – Quarterly – {Reference C1A11} –** Identify and inspect waterflow alarm and supervisory signal devices to verify they are free of physical damage including mechanical, vane type, paddle type, and pressure switch type waterflow alarm devices.

2. **Alarm Devices – Testing – Quarterly – {Reference C1A12}** – Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly.

3. **Alarm Devices – Testing – SemiAnnually – {Reference C1A12} –** Vane-type and pressure switch–type waterflow alarm devices shall be tested semiannually.

4. **Alarm Devices – Dry Pipe Sprinkler Systems – Air Pressure Alarms – Testing – Annually – {Reference C1D2} –**Air pressure alarms, if provided, shall be tested annually in accordance with the manufacturer's instructions. High- or low-air pressure switch – 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.

5. **Alarm Devices – Preaction Sprinkler Systems – Air Pressure Alarms – Testing – Quarterly – {Reference C1E4} –** Low air pressure alarms, if provided, shall be tested quarterly in accordance with the manufacturer's instructions.

6. **Alarm Devices – Deluge Sprinkler Systems – Air Pressure Alarms – Testing – Quarterly – {Reference C1F4} –** Low air pressure supervisory devices, if provided on the detection system, shall be tested quarterly in accordance with the manufacturer's instructions.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
PA 4007 / 12-20

VALVE ENCLOSURES – INSPECTION / TESTING
AIR PRESSURE MAINTENANCE DEVICES – INSPECTION / TESTING

Building ID:

- Use this form to document inspection, testing of sprinkler system valve enclosures and air pressure maintenance devices.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Valve Enclosure – Inspection – Daily/Weekly – {Reference C1D1, C1E1, C1F1} –** Valve enclosures subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C). Valve enclosures equipped with low temperature alarms shall be inspected weekly. Record the temperature of the enclosure.

2. **Valve Enclosure – Low Temperature Alarms – Inspection – Annually – {Reference C1D1, C1E1, C1F1}** – Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.

3. **Valve Enclosure – Low Temperature Alarms - Testing – Annually – {Reference C1D2, C1E2, C1F2}** – Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.

4. **Air Pressure Maintenance Devices – Inspection – Monthly – {Reference C1D7, C1E6, C1F6} –** Inspect air compressors dedicated to water-based fire protection systems to verify the following:
   (1) Air compressor is free of physical damage.
   (2) Power wiring to the air compressor is intact and free of physical damage.
   (3) Piping from the air compressor to the fire protection system is intact and free of physical damage.
   (4) The means of anchoring the air compressor to the structure or to the system piping is secure, tight, and free of physical damage.
   (5) Air compressors requiring oil have the required amount of oil in the oil reservoir.

5. **Air Pressure Maintenance Device – Testing – Annually – {Reference C1D7, C1E6, C1F6} –** Test air compressors dedicated to water-based fire protection systems to verify the following:
   (1) Air compressor operates as intended on the proper drop of air pressure in the fire protection system.
   (2) Air compressor restores normal air pressure in the fire protection system in the required time frame.
   (3) Air compressor does not overheat while running.
   - Test automatic air pressure maintenance devices annually during the dry pipe / preaction / deluge valve trip test in accordance with the manufacturer's instructions.

6. **Air Pressure Maintenance Device – Maintenance – Annually or as per Manufacturer's Instructions – {Reference C1D7, C1E6, C1F6} –** Compressors requiring oil shall have the oil replaced on an annual basis unless the manufacturer's instructions require more frequent replacement. (Document details of all maintenance performed in Notes)

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
SPRINKLERS HEAD TESTING

PA 4008 / 12-20

Building ID: **System ID:**

- Use this form to document inspection and testing of sprinkler heads.
- Record "S" to indicate a satisfactory result or "U" if unsatisfactory.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

General

- Sprinklers manufactured prior to 1920 shall be replaced.
- Where documentation of the installation date is not available, the start date for the in-service interval should be based upon the sprinkler's manufacture date.
- Where required by this section, sample sprinklers shall be submitted to a recognized testing laboratory acceptable to the authority having jurisdiction for field service testing.
- A representative sample of sprinklers for testing per 5.3.1.1.1 shall consist of a minimum of not less than four sprinklers or 1 percent of the number of sprinklers per individual sprinkler sample, whichever is greater.

1. **Sprinklers – Replace or Test – 50 Years – {Reference C1A16} –** Where sprinklers have been in service for 50 years, they shall be replaced or representative samples from one or more sample areas shall be tested. Test procedures shall be repeated at 10-year intervals.

2. **Sprinklers – Replace or Test – 75 Years – {Reference C1A16} –** Where sprinklers have been in service for 75 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory acceptable to the authority having jurisdiction for field service testing and repeated at 5-year intervals.

3. **Sprinklers – Fast Response Elements – Replace or Test – 20 Years – {Reference C1A16}** – Sprinklers manufactured using fast-response elements that have been in service for 20 years shall be replaced or representative samples shall be tested and then retested at 10-year intervals.

4. **Sprinklers – Extra High Temperature [325°F (163°C)] or Greater – Test – 5 Years – {Reference C1A16} –** Representative samples of solder-type sprinklers with a temperature classification of extra high [325°F (163°C)] or greater that are exposed to semicontinuous to continuous maximum allowable ambient temperature conditions shall be tested at 5-year intervals.

5. **Sprinklers – Dry Sprinklers – Replace or Test – 10 Years – {Reference C1A16} -** Dry sprinklers that have been in service for 10 years shall be replaced or representative samples shall be tested and then retested at 10-year intervals.

6. **Sprinklers – Harsh Environments – Replace or Test – 5 Years – {Reference C1A16} -** Where sprinklers are subjected to harsh environments, including corrosive atmospheres and corrosive water supplies, on a 5-year basis, either sprinklers shall be replaced or representative sprinkler samples shall be tested.

S = Satisfactory **U = Unsatisfactory**

Sprinkler Head ID / System ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
SPRINKLER SYSTEM OBSTRUCTION INVESTIGATION

PA 4009 / 12-20

Building ID: **System ID:**

S = Satisfactory **U = Unsatisfactory (explain below)**

Years	First Required Test Date	5	10	15	20	25	30	35	40	45
Every 5 Years Obstruction Investigation (every 5 years or as needed)										
Inspector										
Date										

Notes: (List and provide details on how obstruction investigation was conducted and findings for each year conducted.)

SPRINKLER SYSTEMS
SIGNS / SPRINKLERS / HANGERS / PIPING – INSPECTION

PA 4010 / 12-20

Building ID:

- Use this form to document inspection of sprinkler system signs, sprinklers, hangers, and piping.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Signs – Hydraulic Design Information / General Information / Information / Antifreeze / Auxilliary Drains – Inspection – Quarterly/Annually – {Reference C1A13} –** Identify and inspect each sign for each sprinkler system.

2. **Sprinklers – Inspection – Annually – {Reference C1A15} -** Sprinklers shall be inspected from the floor level annually. Any sprinkler that shows signs of any of the following shall be replaced:
   (1) Leakage
   (2) Corrosion detrimental to sprinkler performance
   (3) Physical damage
   (4) Loss of fluid in the glass bulb heat-responsive element
   (5) Loading detrimental to sprinkler performance
   (6) Paint other than that applied by the sprinkler manufacturer

3. **Spare Sprinklers – Inspection – Annually – {Reference C1A15} –** The supply of spare sprinklers shall be inspected annually for the following:
   (1) The correct number and type of sprinklers as required by 5.4.1.5
   (2) A sprinkler wrench for each type of sprinkler as required by 5.4.1.5.5
   (3) The list of spare sprinklers as required by 5.4.1.5.6

4. **Hanger/Seismic Bracing – Inspection – Annually – {Reference C1A14} –** Sprinkler pipe hangers, braces, and supports shall be inspected annually from the floor level.

5. **Pipe and Fittings – Inspection – Annually – {Reference C1A17}** – Sprinkler pipe and fittings shall be inspected annually from the floor level. Pipe and fittings shall be free of mechanical damage, leakage, and corrosion.

S = Satisfactory **U = Unsatisfactory**

System ID /Device ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
MAIN DRAIN / ANTIFREEZE / PRIMING WATER – TESTING

PA 4011 / 12-20

Building ID: **System ID:**

- Use this form to document testing of sprinkler systems.
- Record "S" to indicate a satisfactory result or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Main Drain – Testing – Quarterly/Annually – {Reference C1A18}** – A main drain test shall be conducted annually for each water supply lead-in to a building waterbased fire protection system to determine whether there has been a change in the condition of the water supply. In systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves, the main drain test of at least one system downstream of the device shall be conducted on a quarterly basis.
   - The main drain test is conducted in the following manner:
     (1) Record the pressure indicated by the supply water gauge.
     (2) Close the alarm control valve on alarm valves.
     (3) Fully open the main drain valve.
     (4) After the flow has stabilized, record the residual (flowing) pressure indicated by the water supply gauge.
     (5) Close the main drain valve slowly.

2. **Antifreeze Systems – Testing – Annually – {Reference C1C3}** – Annually, before the onset of freezing weather, the antifreeze solution shall be tested using the following procedure:
   (1) Using the antifreeze information sign required by 4.1.10, installation records, maintenance records, information from the owner, chemical tests, or other reliable sources of information, the type of antifreeze in the system shall be determined and (a) or (b) implemented if necessary:
     (a) If the antifreeze is found to be a type that is no longer permitted, the system shall be drained completely and the antifreeze replaced with an acceptable solution.
     (b) If the type of antifreeze cannot be reliably determined, the system shall be drained completely and the antifreeze replaced with an acceptable solution in accordance with 5.3.3.4.
   (2) If the antifreeze is not replaced in accordance with 5.3.3(1)(a) and 5.3.3(1)(b), test samples shall be taken at the top of each system and at the bottom of each system as follows:
     (a) If the most remote portion of the system is not near the top or the bottom of the system, an additional sample shall be taken at the most remote portion.
     (b) If the connection to the water supply piping is not near the top or the bottom of the system, an additional sample shall be taken at the connection to the water supply.
   (3) The specific gravity of each solution shall be checked using a hydrometer with a suitable scale or a refractometer having a scale calibrated for the antifreeze solution.
   (4) If any of the samples exhibits a concentration in excess of what is permitted by 5.3.3.4, the system shall be emptied and refilled with a new acceptable solution.
   (5) If a concentration greater than what is currently permitted by 5.3.3.4 was necessary to keep the fluid from freezing, alternative methods for preventing the pipe from freezing shall be employed.

3. **Dry Pipe / Preaction Systems – Priming Water Level – Testing – Quarterly - {Reference C1D5, C1E4}** – The priming water level in dry pipe systems / supervised preaction systems shall be tested quarterly for compliance with the manufacturer's instructions.
   (1) Open the priming level test valve.
   (2) If water flows, drain it.
   (3) Close the valve when water stops flowing and air discharges.
   (4) If air discharges when the valve is opened, the priming water level could be too low. To add priming water, refer to the manufacturer's instructions.

S = Satisfactory **U = Unsatisfactory**

System ID /Device ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
DRY PIPE SPRINKLER SYSTEM – TESTING

PA 4012 / 12-20

Building ID: **System ID:**

Date: **Inspector:** **Last Full Trip Test Date:**

- Use this form to document testing of dry pipe sprinkler systems.
- Record the required information below pertinent to the test performed.
- Use the Notes section to record additional information resultant from the testing including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Dry Pipe System – Trip Test – 3 Years - {Reference C1D5} – Conduct the trip test of the dry pipe valve with the control valve fully open every 3 years and whenever the system is altered. A full flow trip test generally requires at least two individuals, one of whom is situated at the dry pipe valve while the other is at the inspector's test. If possible, they should be in communication with each other.

A full flow trip test is conducted as follows:

(1) The main drain valve is fully opened to clean any accumulated scale or foreign material from the supply water piping. The main drain valve then is closed.
(2) The system air or nitrogen pressure and the supply water pressure are recorded.
(3) The system air or nitrogen pressure is relieved by opening the inspector's test valve completely. Concurrent with opening the valve, both testers start their stopwatches. If two-way communication is not available, the tester at the dry valve is to react to the start of downward movement on the air pressure gauge.
(4) Testers at the dry pipe valve note the air pressure at which the valve trips and note the tripping time.
(5) Testers at the inspector's test note the time at which water flows steadily from the test connection. This time is noted for comparison purposes to previous tests and is not meant to be a specific pass/fail criterion. Note that NFPA 13 does not require water delivery in 60 seconds for all systems.
(6) When clean water flows, the test is terminated by closing the system control valve.
(7) The air or nitrogen pressure and the time elapsed are to be recorded as follows:
  a) From the complete opening of the test valve to the tripping of the valve
  b) From the complete opening of inspector's valve to the start of steady flow from the test connection
(8) All low-point drains are opened and then closed when water ceases to flow.
(9) The dry pipe valve and quick-opening device are reset, if installed, in accordance with the manufacturer's instructions, and the system is returned to service.

2. Dry Pipe System – Trip Test – Annually - {Reference C1D5} – Conduct a trip test of each dry pipe valve. During those years when full flow testing in accordance with 13.4.5.2.2.2 is not required, each dry pipe valve shall be trip tested with the control valve partially open.

A partial flow trip test is conducted in the following manner:

(1) Fully open the main drain valve to clean any accumulated scale or foreign material from the supply water piping.
(2) Close the control valve to the point where additional closure cannot provide flow through the entire area of the drain outlet.
(3) Close the valve controlling flow to the device if a quick-opening device is installed.
(4) Record the system air or nitrogen pressure and the supply water pressure.
(5) Relieve system air or nitrogen pressure by opening the priming level test valve or the inspector's test valve.
(6) Note and record the air or nitrogen pressure, and supply water pressure when the dry pipe valve trips.
(7) Immediately close the system control valve, and open the main drain valve to minimize the amount of water entering the system piping.
(8) Trip test the quick-opening device, if installed, in accordance with the manufacturer's instructions.
(9) Open all low point drains, and close them when water ceases to flow.
(10) Reset the dry pipe valve and quick-opening device, if installed, in accordance with the manufacturer's instructions, and return the system to service.

3. Dry Pipe System – Quick Opening Device Test – Quarterly – {Reference C1D5} - Except when a full flow trip test is conducted in accordance with A.13.4.5.2.2.2, a quick-opening device should be tested in the following manner:

(1) Close the system control valve
(2) Open the main drain valve, and keep it in the open position
(3) Verify that the quick-opening device control valve is open
(4) Open the inspector's test valve. (Note that a burst of air from the device indicates that it has tripped)
(5) Close the device's control valve
(6) Return the device to service in accordance with the manufacturer's instructions and return the system to service.

4. Dry Pipe System – Gas Leakage Test – 3 Years – {Reference C1D5} - Dry pipe systems shall be tested once every 3 years for gas leakage, using one of the following test methods:

(1) A gas (air or nitrogen) pressure test at 40 psi (3.2 bar) shall be performed for 2 hours.
  (a) The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test.
  (b) Gas leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
(2) With the system at normal system pressure, the gas source (nitrogen supply, compressor, or shop air) shall be shut off for 4 hours. If the low pressure alarm goes off within this period, the leaks shall be addressed

Valve Make and Model No.		**Valve Size**	
QOD Make and Model			
Air Pressure:	**Before Test**	**Trip Pressure**	
Water Pressure	**Before Test**	**Trip Pressure**	
Valve Trip Time:		**System Flood Time**	
QOD Trip Time:		**QOD Trip Pressure**	
Low Air Alarm	**Satisfactorily Tested**	**High Air Alarm**	**Satisfactorily Tested**
Waterflow Alarm	**Satisfactorily Tested**		

Task/Result/Notes:

SPRINKLER SYSTEMS
PREACTION AND DELUGE SYSTEMS – TESTING

PA 4013 / 12-20

Building ID: **System ID:**

- Use this form to document preaction and deluge system testing.
- Record "S" to indicate a satisfactory result or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Preaction System – Testing – 3 Years - {Reference C1E4}** – Every 3 years the preaction valve shall be trip tested with the control valve fully open.

2. **Preaction System – Testing – Alternate Years – {Reference C1E4}** – During those years when full flow testing is not required, trip test the preaction valve with the control valve partially open.

3. **Preaction System – Testing – 3 Years – {Reference C1E4}** – Preaction systems shall be tested once every 3 years for air leakage, using one of the following test methods:
   (1) Perform a pressure test at 40 psi (3.2 bar) for 2 hours. The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
   (2) With the system at normal system pressure, shut off the air source (compressor or shop air) for 4 hours. If the low air pressure alarm goes off within this period, the air leaks shall be addressed.

4. **Preaction / Deluge System – Manual Actuation Devices – Testing – Annually – {Reference C1E4, C1F4}** – Manual actuation devices shall be operated annually.

5. **Deluge System – Testing – Annually – {Reference C1F4} –** Each deluge valve shall be trip tested annually at full flow in warm weather and in accordance with the manufacturer's instructions.
   - It is necessary that the full flow test incorporate the full functionality of the system, which would include any solenoid valves or other actuation devices.
   - During the annual full flow test, the water discharge patterns from all of the open spray nozzles or sprinklers shall be observed to ensure that patterns are not impeded by plugged nozzles, that nozzles are correctly positioned, and that obstructions do not prevent discharge patterns from wetting surfaces to be protected.
   - The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply.

S = Satisfactory **U = Unsatisfactory**

System ID /Valve ID	Date	Inspector	Task/Result	Notes

SPRINKLER SYSTEMS
BUILDING HEAT / AUXILIARY DRAINS – MAINTENANCE

PA 4014 / 12-20

Building ID: **System ID:**

- Use this form to document maintenance of building heat and auxiliary drains.
- Record "S" to indicate a satisfactory result or "U" if unsatisfactory.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Building Heating System – Maintenance – {Reference C1C4} –** The property owner or designated representative shall ensure that water-filled piping is maintained at a minimum temperature of 40°F (4°C). Prior to the start of freezing weather, confirm that the heating system is operating satisfactorily.

2. **Dry Pipe System – Auxiliary Drains - Maintenance – Annually & As Needed – {Reference C1D6} –** Auxiliary drains in dry pipe sprinkler systems shall be drained after each operation of the system, before the onset of freezing weather conditions, and thereafter as needed.

3. **Preaction / Deluge System – Auxiliary Drains - Maintenance – Annually & As Needed – {Reference C1E5, C1F5} –** Auxiliary drains in preaction / deluge systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).
   - Low points equipped with a single valve should be drained as follows:
     (1) Open the low-point drain valve slowly.
     (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve.
     (3) Repeat this procedure until water ceases to discharge.
     (4) Replace plug or nipple and cap as necessary.
   - Low points equipped with dual valves should be drained as follows:
     (1) Close the upper valve.
     (2) Open the lower valve, and drain the accumulated water.
     (3) Close the lower valve, open the upper valve, and allow time for additional water accumulation.
     (4) Repeat this procedure until water ceases to discharge.
     (5) Replace plug or nipple and cap in lower valve.

S = Satisfactory **U = Unsatisfactory**

System ID /Device ID	Date	Inspector	Task/Result	Notes

CHAPTER 2 – STANDPIPE AND HOSE SYSTEMS

General Requirements for Standpipe and Hose Systems

Applicable in NYC Only

NYCFC 2014 901.6.2.1	Standpipe and sprinkler systems. In addition to those records required by NFPA 25, an approved card bearing the dates of each inspection, certificate of fitness number and signature of the certificate of fitness holder shall be posted on the premises near the main water supply control valve. A detailed inspection report relative to conditions of water supply, gravity and pressure tanks and levels therein, valves, risers, piping, sprinkler heads, hose valves, hose and nozzles, fire department connections, alarms, fire pumps, obstructions, and conditions of all other system equipment and appurtenances shall be completed monthly by the certificate of fitness holder. All defects or violations shall be noted on the inspection report.
NYCFC 2014 901.6.3	Supervision. A person holding a certificate of fitness for the following fire protection systems shall personally supervise the inspection, testing, servicing and other maintenance required by this code or the rules with respect to the system supervised by such certificate of fitness holder: 1. Sprinkler systems. 2. Standpipe systems. 3. Foam fire extinguishing systems. 4. Fire alarm systems. 5. Private fire hydrant systems. 6. Yard hydrant systems.
NYCFC 2014 905.12	Maintenance. Standpipe systems shall be maintained, including all required inspection, testing and servicing, in accordance with this section, FC901.6 and NFPA 25.
NYCFC 2014 905.12.1	Standpipe hydrostatic pressure and flow tests. Upon order of the commissioner, but at least once every 5 years, the standpipe system shall be subjected to a hydrostatic pressure test and a flow test to demonstrate its suitability for department use. These tests shall be conducted in compliance with the requirements of the rules and shall be conducted at the owner's risk, by his or her representative before a representative of the department.
NYCFC 2014 912.6	Maintenance. Sprinkler system and standpipe system fire department connections shall be periodically inspected, tested, serviced and otherwise maintained in accordance with FC901.6 and NFPA 25. Upon order of the commissioner, but at least once every 5 years, such fire department connections shall be subjected to a hydrostatic pressure test to demonstrate their suitability for department use. The test shall be conducted in accordance with the rules and at the owner's risk, by his or her representative before a representative of the department.

A. All Standpipe and Hose Systems

A1. Existing Standpipe and Hose Systems – General Information — Update — Form PA 4015

Frequency – Annually

Review General Information Form for all Fire Standpipe and Hose Systems, update as required.

A2. New or Altered Standpipe and Hose Systems – General Information — Update — Form PA 4015

Frequency – As Required

Complete General Information Form for new Fire Standpipe Systems or update General Information Form for Fire Standpipe Systems that has been altered to include repairs and/or modifications to components.

A3. Gauges — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.7.1.1*	NYS Monthly	Gauges shall be inspected monthly to verify that the gauge is operable and not physically damaged.	PA 4019
NFPA 25 2017 A.13.2.7.1.1		"Normal water supply pressure" could be a pressure reading that is too high or too low relative to what reasonably would be expected based on system design information, knowledge of the connected water supply, and/or reading data based on past inspections. "Normal" pressure includes pressure expected to be found on a system in order to adequately supply the supplied fire sprinkler system. For example, a gauge reading a pressure close to or below a sprinkler system's demand listed on the design placard would not be expected to be normal because as, the system could have a water supply issue. Normal water supply pressure on a gauge above an alarm or system check valve might be higher than that of a gauge below as a result of trapped pressure surges. This can be typical in buildings with trapped air located close to metal deck roofs without air conditioning. Gridded systems also have a high probability of excess pressure development, which is why NFPA 13 requires relief valves on such systems. Due to the high probability of excess pressure buildup, gridded wet pipe systems should be provided with a relief valve not less than ¼ in. (6.3 mm) in accordance with NFPA 13. It is normal, though, that the pressure above the alarm or system check valve is typically higher than that of the water supply as a result of trapped pressure surges.	
NFPA 25-2014 6.2.2.1	NJ Quarterly	Gauges on automatic wet and semiautomatic dry standpipe systems shall be inspected quarterly to ensure that they are in good condition and that normal water supply pressure is being maintained.	PA 4019
NFPA 25-2011 6.2.2.1	NYC Monthly	Gauges on automatic standpipe systems shall be inspected monthly to ensure that they are in good condition and that normal water supply pressure is being maintained.	PA 4019
NFPA 25 2017 13.2.7.1.2	NYS Quarterly	Gauges monitoring water pressure shall be inspected quarterly to verify that normal water supply pressure is being maintained.	PA 4019
NFPA 25-2014 6.2.2.2	NJ Weekly	Gauges on automatic dry standpipe systems shall be inspected weekly to ensure that normal air or nitrogen and water pressure are being maintained.	PA 4019
NFPA 25-2011 6.2.2.2	NYC Weekly	Gauges on dry, preaction, and deluge valves shall be inspected weekly to ensure that normal air and water pressure are being maintained.	PA 4019
NFPA 25 2017 13.2.7.1.3	NYS Monthly	Gauges monitoring air or nitrogen pressure shall be inspected monthly to verify that normal air or nitrogen pressure are being maintained.	PA 4019

NFPA 25-2014 6.2.2.3	NJ NYC Monthly	Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected monthly.	PA 4019
NFPA 25 2017 13.2.7.1.3.2	NYS Quarterly	Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected quarterly.	PA 4019

A4. Gauges — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.7.2*	5 Years	Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.	PA 4019
NFPA 25 2017 13.2.7.3		Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.	

A5. Air Pressure Gauges — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2011 13.4.4.1.2	NYC Weekly	Gauges shall be inspected weekly.	PA 4019
NFPA 25 2014 13.4.4.1.2.5	NJ NYC Weekly	Gauges on systems other than those with low air or nitrogen pressure alarms shall be inspected weekly.	PA 4019
NFPA 25 2011 13.4.4.1.2.4	NJ NYC Monthly	Gauges on systems with low air or nitrogen pressure alarms shall be inspected monthly.	PA 4019
NFPA 25 2017 13.2.7.1.3	NYS Monthly	Gauges monitoring air or nitrogen pressure shall be inspected monthly to verify that normal air or nitrogen pressure are being maintained.	PA 4019
NFPA 25 2017 13.2.7.1.3.1		The gauge on the quick-opening device, if provided, shall indicate the same pressure as the gauge on the system side of the dry pipe valve.	
NFPA 25 2017 13.2.7.1.3.2	NYS Quarterly	Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected quarterly.	PA 4019

A6. Control Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.3*		All system valves shall be protected from physical damage and shall be accessible.	
NFPA 25 2017 A.13.2.3		The valves are not required to be exposed. Doors, removable panels, or valve pits can be permitted to satisfy this requirement. Such equipment should not be obstructed by features such as walls, ducts, columns, direct burial, or stock storage.	
NFPA 25 2017 13.3.1*		Each control valve shall be identified and have a sign indicating the system or portion of the system it controls.	
NFPA 25 2017 A.13.3.1		Signs identifying underground fire service main control valves in roadway boxes should indicate the direction of valve opening, the distance and direction of the valve from the sign location (if the valve is subject to being covered by snow or ice), and the location of the wrench if not located with the sign.	
NFPA 25 2017 13.3.1.1		Systems that have more than one control valve that must be closed to work on a system shall have a sign on each affected valve referring to the existence and location of other valves.	
NFPA 25 2017 13.3.1.2*		When a normally open valve is closed, the procedures established in Chapter 15 shall be followed.	
NFPA 25 2017 A.13.3.1.2		Valves that normally are closed during cold weather should be removed and replaced with devices that provide continuous fire protection service.	

NFPA 25 2017 13.3.1.3		Each normally open valve shall be secured by means of a seal or a lock or shall be electrically supervised in accordance with the applicable NFPA standards.	
NFPA 25 2017 13.3.1.4		Normally closed valves shall be secured by means of a seal or shall be electrically supervised in accordance with the applicable NFPA standard.	
NFPA 25 2017 13.3.1.5		Sealing or electrical supervision shall not be required for hose valves.	
NFPA 25 2017 13.3.2.1	Weekly	All valves shall be inspected weekly.	PA 4021
NFPA 25 2017 13.3.2.1.1	Monthly	Valves secured with locks or supervised in accordance with applicable NFPA standards shall be permitted to be inspected monthly.	PA 4021
NFPA 25 2017 13.3.2.1.2	NYS Quarterly	Valves that are electrically supervised shall be permitted to be inspected quarterly.	PA 4021
NFPA 25 2017 13.3.2.2*		The valve inspection shall verify that the valves are in the following condition: (1) In the normal open or closed position (2) *Sealed, locked, or supervised (3) Accessible (4) Post indicator valves (PIVs) are provided with correct wrenches (5) Free from external leaks (6) Provided with applicable identification	
NFPA 25 2017 A.13.3.2.2		Valves should be kept free of snow, ice, storage, or other obstructions so that access is ensured.	
NFPA 25 2017 A.13.3.2.2(2)		The purpose of the valve sealing program is as follows: (1) The presence of a seal on a control valve is a deterrent to closing a valve indiscriminately without obtaining the proper authority. (2) A broken or missing seal on a valve is cause for the plant inspector to verify that protection is not impaired and to notify superiors of the fact that a valve could have been closed without following procedures.	
NFPA 25 2017 13.3.1.2.4	As Required	After any alterations or repairs, an inspection shall be made by the property owner or designated representative to ensure that the system is in service and all valves are in the normal position and properly sealed, locked, or electrically supervised.	

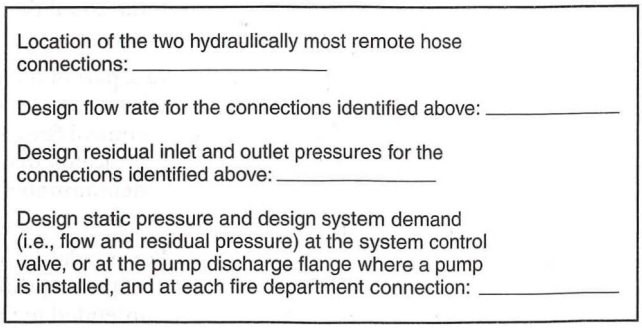
A7. Control Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.1	Annually	Each control valve shall be operated annually through its full range and returned to its normal position.	PA 4021
NFPA 25 2017 13.3.3.2*		Post indicator valves shall be opened until spring or torsion is felt in the rod, indicating that the rod has not become detached from the valve.	
NFPA 25 2017 A.13.3.3.2		A proper wrench needs to be used for this test. Using an improper wrench such as a pipe wrench has resulted in damage to the operating nut. The use of break over bars and extensions on the wrench can damage the valve and/or the post. If the valve cannot be closed and reopened using the proper wrench with reasonable force, then some maintenance and/or repairs are necessary so the valve can be operated when needed in a fire event. These “spring tests” are made to verify that a post indicator valve is fully open. If an operator feels the valve is fully open, he or she should push in the “open” direction. The handle usually moves a short distance (approximately a one-quarter turn) and “springs” back toward the operator in a subtle move when released. This spring occurs when the valve gate pulls up tight against the top of its casting and the valve shaft (being fairly long) twists slightly. The spring indicates that the valve is fully opened and that the gate is attached to the handle. If the gate is jammed due to a foreign particle, the handle is not likely to spring back. If the gate is loose from the handle, the handle continues to turn in the “open” direction with little resistance.	
NFPA 25 2017 13.3.3.2.1		This test shall be conducted every time the valve is closed.	
NFPA 25 2017 13.3.3.3		Post indicator and outside screw and yoke valves shall be backed a one-quarter turn from the fully open position to prevent jamming.	
NFPA 25 2017 13.3.3.4*		A valve status test shall be conducted any time the control valve is closed and reopened at system riser.	
NFPA 25 2017 A.13.3.3.4		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.3.4.1	Annually	The operating stems of outside screw and yoke valves shall be lubricated annually.	PA 4021
NFPA 25 2017 13.3.4.2		The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.	

A8. Control Valve – Supervisory Devices — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1.3	Quarterly	Control valve supervisory alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4021
NFPA 25 2017 13.3.3.5.1	SemiAnnually	Valve supervisory switches shall be tested semiannually.	PA 4021
NFPA 25 2017 13.3.3.5.2		A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.	
NFPA 25 2017 13.3.3.5.3		The signal shall not be restored at any valve position except the normal position.	

A9. Hydraulic Design Information Sign — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.2.2*	Annually	Hydraulic Design Information Sign. The hydraulic design information sign for standpipe systems shall be inspected annually to verify that it is provided, attached securely, and legible.	PA 4018
NFPA 25 2017 A.6.2.2		The design information sign should be secured with durable wire, chain, or equivalent to the water supply control valve for automatic or semiautomatic standpipe systems and at an approved location for manual systems. See Figure A.6.2.2 for sample hydraulic information sign.	
NFPA 25 2017 Figure A.6.2.2		 FIGURE A.6.2.2 Sample Hydraulic Sign. [14:Figure A.6.8]	
NFPA 25 2017 6.2.2.1		A hydraulic design information sign that is missing or illegible shall be replaced.	
NFPA 25 2017 6.2.2.2		A standpipe system that was not sized by hydraulic design shall have a hydraulic design information sign that reads "Pipe Schedule System."	

General Requirements for Pressure Reducing/Regulating Valves (applicable at all facilities)

NFPA 25 2017 6.3.1.5 — Standpipes, sprinkler connections to standpipes, or hose stations equipped with pressure-reducing valves or pressure-regulating valves shall have these valves inspected, tested, and maintained in accordance with the requirements of Chapter 13

A10. Pressure Regulating Valves Hose Connection/Hose Rack Assembly — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.2		Hose Connection Pressure-Regulating Devices.	
NFPA 25 2017 13.5.2.1	Annually	All devices shall be inspected annually to verify the following: (1) The handwheel is not broken or missing. (2) The outlet hose threads are not damaged. (3) No leaks are present. (4) The hose adapter and the cap are not missing.	PA 4022
NFPA 25 2017 13.5.3		Hose Rack Assembly Pressure-Regulating Devices.	
NFPA 25 2017 13.5.3.1	Annually	All devices shall be inspected annually to verify the following: (1) The handwheel is not missing or broken. (2) No leaks are present.	PA 4022

A11. Pressure Regulating Valves Hose Connection/Hose Rack Assembly — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.2		Hose Connection Pressure-Regulating Devices.	
NFPA 25 2017 13.5.2.3	Annually	A partial flow test adequate to move the device from its seat shall be conducted annually.	PA 4022
NFPA 25 2017 13.5.2.2*	5-Year	A full flow test shall be conducted on each device at 5-year intervals and shall be compared to previous test results.	PA 4022
NFPA 25 2017 A.13.5.2.2		PRV devices can be bench tested in accordance with the manufacturer's instructions or tested in place. To test in place, a gauge is connected on both the inlet side and the outlet side of the device, and flow readings are taken using a Pitot tube or a flowmeter. Water is discharged through a roof manifold, if available, or through hose to the exterior of the building. Another acceptable method for systems having at least two risers is to take one standpipe out of service and use it as a drain by removing PRV devices and attaching hoses at the outlets near the ground floor level. When testing in this manner, a flowmeter should be used and a hose line utilized to connect the riser being tested and the drain riser. Readings are to be compared to the system's hydraulic demands at the test location. Field-adjustable valves are to be reset in accordance with manufacturer's instructions. Nonadjustable valves should be replaced. Extreme caution should be exercised because of the high pressure involved when testing. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.5.2.2.1		Adjustments shall be made in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.5.3		Hose Rack Assembly Pressure-Regulating Devices.	
NFPA 25 2017 13.5.3.3	Annually	A partial flow test adequate to move the device from its seat shall be conducted annually.	PA 4022
NFPA 25 2017 13.5.3.2	5 Years	A full flow test shall be conducted on each device at 5-year intervals and compared to previous test results.	PA 4022
NFPA 25 2017 13.5.3.2.1		Adjustments shall be made in accordance with the manufacturer's instructions.	

A12. Piping — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.2.4.1	Annually	Piping shall be inspected annually for the following conditions: (1) Damaged piping (2) Damaged control valves (3) Missing or damaged pipe support device (i.e., missing or damaged hanger or seismic brace) (4) Damaged supervisory signal initiating device	PA 4018
NFPA 25 2017 6.2.4.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A13. Hose Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.6.1.1	Quarterly	Hose valves shall be inspected quarterly to verify that the valves are in the following condition: (1) Hose caps are in place and not damaged. (2) Hose threads are not damaged. (3) Valve handles are present and not damaged. (4) Gaskets are not damaged or showing signs of deterioration. (5) No leaks are present. (6) Valves are not obstructed or otherwise not capable of normal operation.	PA 4020
NFPA 25 2017 13.6.1.2		Hose valves shall be inspected to ensure that hose caps are in place and not damaged.	
NFPA 25 2017 13.6.1.3		Hose threads shall be inspected for damage.	
NFPA 25 2017 13.6.1.4		Valve handles shall be present and not damaged.	
NFPA 25 2017 13.6.1.5		Gaskets shall be inspected for damage or deterioration.	
NFPA 25 2017 13.6.1.6		Hose valves shall be inspected for leaks.	
NFPA 25 2017 13.6.1.7		Hose valves shall be inspected to ensure no obstructions are present.	
NFPA 25 2017 13.6.1.8		Hose valves shall be inspected to ensure that restricting devices are present.	

A14. Hose Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.6.2.1*	Annually	Class I and Class III standpipe system hose valves shall be tested annually by fully opening and closing the valves.	PA 4020
NFPA 25 2017 A.13.6.2.1		Hose valves can be tested without a full flow if the cap is left on the hose threads. The purpose of this requirement is to exercise the valve so it can be operated easily.	
NFPA 25 2017 13.6.2.1.1		Class I and Class III standpipe system hose valves that are difficult to operate or leak shall be repaired or replaced.	
NFPA 25 2017 13.6.2.2*	3 Years	Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems shall be tested every 3 years by opening and closing the valves.	PA 4020
NFPA 25 2017 A.13.6.2.2		See A.13.6.2.1.	
NFPA 25 2017 13.6.2.2.1		Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems that are difficult to operate or leak shall be repaired or replaced.	
NFPA 25 2017 13.6.3		Maintenance. Hose valves that do not operate smoothly or open fully shall be lubricated, repaired, or replaced.	

A15. Hose Connections — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.2.3.1	Annually	Hose connections shall be inspected annually for the following conditions: (1) Valve cap(s) missing or damaged (2) Fire hose connection damaged (3) Valve handles missing or damaged (4) Cap gaskets missing or deteriorated (5) Valve leaking (6) Visible and physical obstructions to hose connections (7) Pressure restricting device missing (8) Manual, semiautomatic, or dry standpipe valve does not operate smoothly (9) Valve threads damaged	PA 4020
NFPA 25 2017 6.2.3.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A16. Cabinets — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.2.8.1	Annually	Cabinets shall be inspected annually for the following conditions: (1) Overall for corroded or damaged parts (2) Difficult to open (3) Cabinet door not opening fully (4) Door glazing cracked or broken (5) Lock on break glass–type cabinet not functioning properly (6) Glass break device missing or not attached (7) Not properly identified as containing fire equipment (8) Visible or physical obstructions (9) All valves, hose, nozzles, fire extinguishers, and so forth, easily accessible	PA 4017
NFPA 25 2017 6.2.8.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A17. Hose — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.2.5.1	Annually	Hose shall be inspected annually for the following conditions as required by NFPA 1962: (1) Mildew, cuts, abrasions, and deterioration (2) Couplings hose threads damaged (3) Gaskets missing or deteriorated (4) Incompatible threads on coupling (5) Hose not connected to hose rack nipple or valve (6) Hose test outdated	PA 4017
NFPA 25 2017 6.2.5.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A18. Hose Nozzle — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.2.6.1	Annually	Hose nozzles shall be inspected annually for the following conditions: (1) Hose nozzle missing (2) Gasket missing or deteriorated (3) Obstructions (4) Does not operate smoothly	PA 4017

NFPA 25 2017 6.2.6.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A19. Hose Storage Device — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.2.7.1	Annually	Hose storage devices shall be inspected annually for the following conditions: (1) Difficult to operate (2) Damaged (3) Visible or physical obstruction (4) Hose improperly racked or rolled (5) Nozzle clip not in place and nozzle not correctly contained (6) Hose rack enclosed in cabinet not swinging out at least 90 degrees	PA 4017
NFPA 25 2017 6.2.7.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A20. Waterflow Alarm Devices — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.6.1.1	Quarterly	Mechanical waterflow alarm devices shall be inspected quarterly to verify that they are free of physical damage	PA 4018
NFPA 25 2017 6.3.3.1		Where provided, waterflow alarm and supervisory alarm devices shall be tested in accordance with 13.2.6 and 13.3.3.5.	
NFPA 25 2017 6.3.3.2		Where freezing conditions necessitate a delay in testing, tests shall be performed as soon as weather allows.	
NFPA 25 2017 13.2.6.1.2	Quarterly	Mechanical waterflow alarm devices shall be tested quarterly.	PA 4018
NFPA 25 2017 13.2.6.2.1	Quarterly	Vane-type, paddle-type, and pressure switch-type waterflow alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4018
NFPA 25 2017 13.2.6.2.2	SemiAnnually	Vane-type, paddle-type, and pressure switch-type waterflow alarm devices shall be tested semiannually.	PA 4018

A21. Standpipe System – Hydrostatic Test — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.3.2.1*	5 Years	Hydrostatic tests of not less than 200 psi (13.8 bar) pressure for 2 hours, or at 50 psi (3.4 bar) in excess of the maximum pressure, where maximum pressure is in excess of 150 psi (10.3 bar), shall be conducted every 5 years on manual standpipe systems and semiautomatic dry standpipe systems, including piping in the fire department connection.	PA 4016
NFPA 25 2017 A.6.3.2.1		The intent of 6.3.2.1 is to ascertain whether the system retains its integrity under fire conditions. Minimum leakage existing only under test pressure is not cause for repair.	
NFPA 25 2017 6.3.2.1.1		Manual wet standpipes that are part of a combined sprinkler/standpipe system shall not be required to be tested in accordance with 6.3.2.1.	
NFPA 25 2017 6.3.2.2		The hydrostatic test pressure shall be measured at the low elevation point of the individual system or zone being tested.	
NFPA 25 2017 6.3.2.2.1		The inside standpipe piping shall show no leakage.	

A22. Standpipe System – Flow Tests — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.3.1.1*	5 Years	A flow test shall be conducted every 5 years on all automatic standpipe systems to verify that the required flow and pressure are available at the hydraulically most remote hose valve outlet(s) while flowing the standpipe system demand.	PA 4016

NFPA 25 2017 A.6.3.1.1		The hydraulically most remote hose connections in a building are generally at a roof manifold, if provided, or at the top of a stair leading to the roof. In a multizone system, the testing means is generally at a test header at grade or at a suction tank on higher floors.	
NFPA 25 2017 6.3.1.1.1		Where a flow test of the hydraulically most remote outlet(s) is not practical, the authority having jurisdiction shall be consulted for the appropriate location for the test.	
NFPA 25 2017 6.3.1.1.2		Pressure gauges maintained in accordance with 8.3.3.2.2 shall be provided for the test.	
NFPA 25 2017 6.3.1.2*		Class I and Class III standpipe system demand shall include 500 gpm (1892 L/min) for the most remote standpipe and 250 gpm (946 L/min) for each additional standpipe until the total system demand is simultaneously flowing.	
NFPA 25 2017 A.6.3.1.2		When the standpipe system was accepted, NFPA 14 required that each additional standpipe be flowed to simulate the hydraulic calculations. Typically, the lowest hose valve was used to create this simultaneous flow so hoses wouldn't have to be run all the way down each standpipe.	
NFPA 25 2017 A.6.3.1.2		When the standpipe system was accepted, NFPA 14 required that each additional standpipe be flowed to simulate the hydraulic calculations. Typically, the lowest hose valve was used to create this simultaneous flow so hoses wouldn't have to be run all the way down each standpipe.	
NFPA 25 2017 6.3.1.2.1*		The 250 gpm (946 L/min) required from each additional Class I and Class III standpipe shall be allowed to be flowed from the most convenient hose valve on that standpipe.	
NFPA 25 2017 A.6.3.1.2.1		Since the pressures at each standpipe aren't required to be balanced by NFPA 14 or this standard, any hose valve on the standpipe can be flowed to achieve the additional 250 gpm (950 L/min) needed. It might be more convenient to use a hose valve on an upper level rather than the lowest one on the standpipe.	
NFPA 25 2017 6.3.1.2.2*		Where the 250 gpm (946 L/min) cannot be flowed from each additional Class I and Class III standpipe, the authority having jurisdiction shall determine where the additional flow can be taken.	
NFPA 25 2017 A.6.3.1.2.2		In some instances it isn't reasonable to attach a hose to a standpipe to provide this additional flow point. The authority having jurisdiction can allow the additional flow be made at other outlets on the standpipe system, such as from another standpipe, or from the fire pump test header. Although the results of having the flow points somewhere else in the standpipe system won't match the hydraulic calculations, the test will still prove that the most remote standpipe can provide the necessary flow and pressure required for fire department use while simultaneously flowing the full system demand.	
NFPA 25 2017 6.3.1.3		Class II standpipe system demand shall include 100 gpm (379 L/min) for the most remote standpipe connection.	
NFPA 25 2017 6.3.1.4		The standpipe system demand shall be based on the design criteria in effect at the time of the installation.	
NFPA 25 2017 6.3.1.4.1		Where the standpipe system demand cannot be determined, the authority having jurisdiction shall determine the standpipe system demand.	
NFPA 25 2017 6.3.1.4.2		The actual test method(s) and performance criteria shall be discussed in advance with the authority having jurisdiction.	

A23. Main Drain Test — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.3.1.6		A main drain test shall be performed on all standpipe systems with automatic water supplies in accordance with the requirements of Chapter 13.	
NFPA 25 2017 6.3.1.6.1		The test shall be performed at the low point drain for each standpipe or the main drain test connection where the supply main enters the building (when provided).	
NFPA 25 2017 13.2.5*	Annually	Main Drain Test. A main drain test shall be conducted annually for each water supply lead-in to a building waterbased fire protection system to determine whether there has been a change in the condition of the water supply.	PA 4018
NFPA 25 2017 A.13.2.5		Main drains are installed on system risers for one principal reason: to drain water from the overhead piping after the system is shut off. This allows the contractor or plant maintenance department to perform work on the system or to replace nozzles after a fire or other incident involving system operation. Data collected from the suction gauges during a fire pump flow test that test the water supply would satisfy the requirements for a main drain test. These drains also are used to determine whether there is a major reduction in waterflow to the system, such as could be caused by a major obstruction, a dropped gate, a valve that is almost fully closed, or a check valve clapper stuck to the valve seat. A satisfactory main drain test (i.e., one that reflects the results of previous tests) does not necessarily indicate an unobstructed passage, nor does it prove that all valves in the upstream	

		flow of water are fully opened. However, these tests provide a reasonable level of confidence that the water supply has not been compromised. The main drain test is conducted in the following manner: (1) Record the pressure indicated by the supply water gauge. (2) Close the alarm control valve on alarm valves. (3) Fully open the main drain valve. (4) After the flow has stabilized, record the residual (flowing) pressure indicated by the water supply gauge. (5) Close the main drain valve slowly. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.2.5.1		Where the lead-in to a building supplies a header or manifold serving multiple systems, a single main drain test shall be permitted.	
NFPA 25 2017 13.2.5.2	Quarterly	In systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves, the main drain test of at least one system downstream of the device shall be conducted on a quarterly basis.	PA 4018
NFPA 25 2017 13.2.5.3		When there is a 10 percent reduction in full flow pressure when compared to the original acceptance test or previously performed tests, the cause of the reduction shall be identified and corrected if necessary.	

A24. Obstruction Investigation — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 14.2.1*		An assessment of the internal condition of piping shall be conducted on a frequency determined by 14.2.1.1 or 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.	
NFPA 25 2017 A.14.2.1		It is the intent of this requirement to provide a reasonable assurance that corrosion and obstruction issues within fire protection systems are identified. It is not the intent to require verification that every piece of pipe in the system is free from corrosion and obstructions. An assessment of the internal condition of piping can be accomplished by several methods that meet the intent of this section. These methods include the following: (2) Standpipe and hose systems. (a) Opening a flushing connection or fitting at the end of one main, removing a remote hose connection fitting, and removing the end fitting of horizontal branch line (if present) for the purpose of inspecting for the presence of foreign organic and inorganic material. i. When performing normal maintenance that involves draining down a system to modify a system such as for tenant fit out or building renovations, or when removing or replacing piping, this inspection can be performed as described and properly recorded at that time. The time interval would then start for the next assessment of that system at the frequency determined by 14.2.1.1 or 14.2.1.2. (b) Utilizing alternative examination methods such as the following: i. Using video inspection equipment that is inserted into the system at strategic points to observe the internal condition of pipes. This equipment provides a visual exam of the pipes using a camera and lighting system on the end of a push cable. Video inspection equipment can be inserted in valves for a look into risers, feed mains, some cross mains, and some branch lines, depending on the system configuration. The push cable can also be inserted in a check valve when performing the five-year internal inspection required by 13.4.2.1 to view additional areas of a system, and in the fire department connection to perform the interior inspection required by 13.8.3. ii. Ultrasonic or similar technology that allows the pipe wall to be tested to determine the extent of any deterioration due to microbiologically influenced corrosion (MIC) or other forms of corrosion. This method would not typically be used for the internal inspection of piping required by this section because it might not detect the presence of solid material in the piping, such as wood, plastic, or other foreign obstructions, that are not a byproduct of corrosion, because only small representative sections of pipe are examined. iii. A laboratory analysis of water samples obtained from the fire protection system, combined with collecting and inspecting solid material from fire protection system water discharged from a main drain, and an inspector's test connection, can provide an indication of the presence of corrosion, MIC, and/or foreign materials. If a high level of MIC is identified, or if a significant amount of foreign materials is found, further investigation might be warranted to verify the extent of corrosion,	

		MIC, or other obstructions in the system. The solid materials should be collected with an appropriately sized strainer. If inspection of the solid materials identifies excessive rust, black water color, or sulfur (rotten egg) odors, an obstruction investigation as described in Section 14.3 is warranted.	
NFPA 25 2017 14.2.1.1	5 Years	An assessment of the internal condition of piping shall be conducted at a minimum of every 5 years or in accordance with 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.	
NFPA 25 2017 14.2.1.2*		Where an assessment frequency has been established by an approved risk analysis, the assessment shall be performed at a frequency determined by the approved risk analysis.	
NFPA 25 2017 A.14.2.1.2		The purpose of the assessment of the internal condition of piping is to identify whether foreign organic and inorganic material is present, since the presence of such material can potentially be detrimental to the performance of the sprinkler system. Corrosion, which includes microbiologically influenced corrosion (MIC), can be prevalent in sprinkler piping, but not necessarily in all systems, buildings, or geographic locations. Therefore, the risk analysis should be based upon evidence noted and/or data obtained from proximate sprinkler systems, known problems from the water supply, as well as other factors that could affect the integrity of the system piping. The decision of when, how often, and which method to use to conduct an assessment should also consider the risk of emptying and refilling the sprinkler system with water, which could adversely impact the sprinkler system by introducing foreign or inorganic material into the sprinkler system.	
NFPA 25 2017 14.2.1.3		Tubercules or slime, if found, shall be tested for indications of microbiologically influenced corrosion (MIC).	
NFPA 25 2017 14.2.1.4*		If the presence of sufficient foreign organic or inorganic material is found to obstruct pipe or sprinklers, an obstruction investigation shall be conducted as described in Section 14.3.	
NFPA 25 2017 A.14.2.1.4		Most piping systems contain some foreign material or other evidence of corrosion but not sufficient to trigger an obstruction investigation. Furthermore, an internal inspection is primarily an inspection for determining corrosion of the pipe, but it can result in finding the presence of material that would be an obstruction to piping or sprinklers. If such is found, an obstruction investigation in Section 14.3 would be required.	
NFPA 25 2017 14.2.1.5		Nonmetallic pipe shall not be required to comply with Section 14.2.	
NFPA 25 2017 14.2.2*		In buildings having multiple wet pipe systems, every other system shall have an assessment of the internal condition of piping as described in 14.2.1.	
NFPA 25 2017 A.14.2.2		In large warehouses, high-rise buildings, and other buildings having multiple systems, it is reasonable to perform the assessment on half of the systems, and conclude that these are representative of all systems in the building. The systems in the building not assessed during one frequency cycle should be assessed during the next one. As long as there is no evidence of any foreign organic and/or inorganic material found in any of the systems being assessed, every other system would be assessed once every frequency cycle. However, if foreign organic and/or inorganic material is found in any system in the building during the frequency cycle, all systems must would then be assessed during that frequency cycle.	
NFPA 25 2017 14.2.2.1		During the next inspection frequency required by 14.2.1.1 or 14.2.1.2, the alternate systems not assessed during the previous assessment shall be assessed as described in 14.2.1.	
NFPA 25 2017 14.2.2.2		If foreign organic and/or inorganic material is found in any system in a building, all systems shall be assessed.	
NFPA 25 2017 14.3.1*		An obstruction investigation shall be conducted for system or yard main piping wherever any of the following conditions exist: (1) Defective intake for fire pumps taking suction from open bodies of water (2) The discharge of obstructive material during routine water tests (3) Foreign materials in fire pumps, in dry pipe valves, or in check valves (4) Foreign material in water during drain tests or plugging of inspector's test connection(s) (1) Unknown materials are heard in the system piping during draining, refilling, or otherwise flowing water through the system (2) Plugged sprinklers (3) The presence of sufficient foreign organic or inorganic material is found in the pipe (4) Failure to flush yard piping or surrounding public mains following new installations or repairs (5) A record of broken public mains in the vicinity (6) Abnormally frequent false tripping of a dry pipe valve(s) (7) A system that is returned to service after an extended shutdown (greater than 1 year) (8) There is reason to believe that the sprinkler system contains sodium silicate or highly corrosive fluxes in copper systems (9) A system has been supplied with raw water via the fire department connection (10) Pinhole leaks (11) A 50 percent increase in the time it takes water to travel to the inspector's test connection from the time the valve trips during a full flow trip test of a dry pipe sprinkler system when compared to the original system acceptance test	

NFPA 25 2017 A.14.3.1		Most piping systems contain some foreign material or other evidence of corrosion but not sufficient to trigger an obstruction investigation. Furthermore, an internal inspection is primarily an inspection for determining corrosion of the pipe, but it can result in finding the presence of material that would be an obstruction to piping or sprinklers. If such is found, an obstruction investigation in Section 14.3 would be required. For obstruction investigation procedures, see Section D.3. The type of obstruction investigation should be appropriately selected based on the observed condition. For instance, ordering an internal obstruction investigation would be inappropriate where the observed condition was broken public mains in the vicinity. On the other hand, such an investigation would be appropriate where foreign materials are observed in the dry pipe valve.	
NFPA 25 2017 14.3.2*		Systems shall be examined for internal obstructions where conditions exist that could cause obstructed piping.	
NFPA 25 2017 A.14.3.2		For obstruction prevention program recommendations, see Section D.4.	
NFPA 25 2017 D.4		Obstruction Prevention Program. Possibly include in an appendix or provide upon request.	
NFPA 25 2017 14.3.2.1		If the condition has not been corrected or the condition is one that could result in obstruction of the piping despite any previous flushing procedures that have been performed, the system shall be examined for internal obstructions every 5 years.	
NFPA 25 2017 14.3.2.2*		Internal examination shall be performed at the following minimum four points: (1) System valve (2) Riser (3) Cross main (4) Branch line	
NFPA 25 2017 A.14.3.2.2		The indicated locations are presented as the minimum basis for determining the need for the initiation of a more extensive obstruction investigation effort. Additional points of examination can be appropriately dictated to assess the extent and severity of the obstructing material as determined by the observed conditions at these locations. See Section D.3 for further discussion.	
NFPA 25 2017 D.3		Investigation Procedures. Possibly include in an appendix or provide upon request.	
NFPA 25 2017 14.3.2.3*		Alternative nondestructive examination methods shall be permitted.	
NFPA 25 2017 A.14.3.2.3		Alternative examination methods can include the following: (1) Using video inspection equipment that is inserted into the system at strategic points to observe the internal condition of pipes. This equipment provides a visual exam of the pipes using a camera and lighting system on the end of a push cable. Video inspection equipment can be inserted in alarm, dry, and preaction valves, in the risers, and into cross mains and branch lines, depending on the system configuration. This equipment can also be used to determine the results of any flushing that was performed. (2) Ultrasonic or similar technology that allows the pipe wall to be externally tested to determine the extent of any deterioration due to MIC or other forms of corrosion. This method has advantages including allowing the system to be left in service while performing the examination, and pinpointing where pipes are about to fail before the actual failure occurs, allowing preventive action to be taken. This technology does have its limitations, and to be thorough all pipes would require access, even those in concealed spaces such as those above ceilings. This technology can detect the presence of a buildup of sludge, scale, or other by-products of corrosion, and can detect existing air pockets in wet systems as well as trapped sections of pipe in dry systems that aren't adequately drained. This technology cannot detect the presence of MIC itself, but can detect tubercules caused by MIC. In most cases this technology will not detect the presence of solid material in the piping such as wood, plastic, or other foreign obstructions that are not a by-product of corrosion, because only small representative sections of pipe are examined.	
NFPA 25 2017 14.3.3*		If an obstruction investigation indicates the presence of sufficient material to obstruct pipe or sprinklers, a complete flushing program shall be conducted by qualified personnel.	
NFPA 25 2017 A.14.3.3		For obstruction investigation flushing procedures, see Section D.5.	
NFPA 25 2017 D.5		Flushing Procedures. Possibly include in an appendix or provide upon request.	
NFPA 25 2017 14.3.4		Tubercules or slime, if found during an obstruction investigation, shall be tested for indications of microbiologically influenced corrosion (MIC).	

NFPA 25 2017 14.4.		Ice Obstruction. Dry pipe or preaction sprinkler system piping that protects or passes through refrigerated spaces maintained at temperatures below 32°F (0°C) shall be inspected internally on an annual basis for ice obstructions at the point where the piping enters the refrigerated area.	
NFPA 25 2017 14.4.1		Alternative nondestructive examinations shall be permitted.	
NFPA 25 2017 14.4.2		All penetrations into the refrigerated spaces shall be inspected and, if an ice obstruction is found, additional pipe shall be examined to ensure that no additional ice obstructions or ice blockages exist.	

B. Combination Sprinkler and Standpipe Systems

- All components of the standpipe system are required to comply with Section A of this Chapter “All Standpipe and Hose Systems.”
- All components of the sprinkler system are required to comply with Chapter 1 – Sprinkler Systems.

C. Dry Standpipe Systems

- Pre-Action, Deluge, and Dry valves assemblies used in dry standpipe systems shall be inspected, tested, and maintained following requirements for these valves identified in Chapter 1 – Sprinkler Systems. Documentation can be completed on the forms identified in Chapter 1 noting the standpipe system ID.

D. Component Action Requirements

D1. Component Action Requirements — Adjusted, Repaired, Reconditioned, Replaced

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 6.5.1		Whenever components in standpipe and hose systems are adjusted, repaired, reconditioned, or replaced, the actions required in Table 6.5.1 shall be performed.	
NFPA 25 2017 6.5.2		Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.	
NFPA 25 2017 6.5.3		These actions shall not require a design review, which is outside the scope of this standard.	

Table 6.5.1 Summary of Component Action Requirements

Component	Adjust	Repair	Replace	Required Action
Water Delivery Components				
Control valves	X	X	X	See Chapter 13
Hose valve pressure-regulating devices	X	X	X	See Chapter 13
System pressure-regulating devices	X	X	X	See Chapter 13
Piping	X	X	X	Hydrostatic test in conformance with NFPA 14
Fire hose			X	No action required
Fire hose		X		Perform hydrostatic test in accordance with NFPA 1962
Hose valve	X	X	X	See Chapter 13
Fire department connections	X	X	X	See Chapter 13
Backflow prevention device	X	X	X	See Chapter 13
Alarm and Supervisory Components				
Vane-type waterflow	X	X	X	Operational test using inspector's test connection
Pressure switch–type waterflow	X	X	X	Operational test using inspector's test connection
Water motor gong	X	X	X	Operational test using inspector's test connection
Valve supervisory device	X	X	X	Operational test for receipt of alarms and verification of conformance with NFPA 14 and/or *NFPA 72*
Status-Indicating Components				
Gauges			X	Verify at 0 psi (0 bar) and system working pressure
System Housing and Protection Components				
Cabinet	X	X	X	Verify compliance with NFPA 14
Hose storage rack	X	X	X	Verify compliance with NFPA 14
Testing and Maintenance Components				
Drain riser	X	X	X	Inspect for leaks while flowing from connection above the repair
Auxiliary drains	X	X	X	Inspect for leaks at system working pressure
Main drain	X	X	X	Inspect for leaks and residual pressure during main drain test
Structural Components				
Hanger/seismic bracing	X	X	X	Verify conformance with NFPA 14
Pipe stands	X	X	X	Verify conformance with NFPA 14
Informational Components				
Identification signs	X	X	X	Verify conformance with NFPA 14
Hydraulic placards	X	X	X	Verify conformance with NFPA 14

STANDPIPE AND HOSE SYSTEMS
GENERAL INFORMATION

PA 4015 / 12-20

Building ID: **System ID:**

Standpipe System Type (Class I, II, or III):

General

Location of main control valve:	
Number of control valves:	
How are control valves supervised?	
Are control valves identified with signs?	

Hose Stations

Number of hose stations:	
Is hose provided in hose stations?	
Are shutoff nozzles provided?	
Are pressure regulating devices provided? If so, provide number and type of device.	

Water Supply

Identify water supply source: (municipal system, fire pump, storage tank)	
Design pressure /	
Fire Pump ID / Location: (if supply is from a fire pump)	
Fire Pump Maintained by:	

Fire Department Connections

Number and location of connections	
Are identification signs provided?	

Notes:

STANDPIPE AND HOSE SYSTEMS
HYDROSTATIC AND FLOW TESTS

PA 4016 / 12-20

Building ID:

- Use this form to document hydrostatic and flow tests of fire standpipe systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Hydrostatic Test – Testing – 5 Years - {Reference C2A21} –** Perform hydrostatic test on manual standpipe systems and semiautomatic dry standpipe systems, including piping in the fire department connection.

Test Starting Pressure	Record the hydrostatic test pressure at the start of the test. Test pressure should be 200 psi (13.8 bar) or 50 psi (3.4 bar) above normal pressure if normal pressure exceeds 150 psi (10.3 bar).	psi(bar)
Start Time	Record the time at the start of the test after the test pressure is reached.	
End Time	Record the time at the conclusion of the hydrostatic test. The system should hold the pressure for at least 2 hours.	
Test Ending Pressure	Record the hydrostatic pressure at the conclusion of the test.	psi(bar)

2. **Flow Test – Testing – 5 Years - {Reference C2A22}** – A flow test shall be conducted every 5 years on all automatic standpipe systems to verify that the required flow and pressure are available at the hydraulically most remote hose valve outlet(s) while flowing the standpipe system demand.

Location of hydraulically most remote standpipe outlet used for flow test.	
Static Pressure	psi(bar)
Residual Pressure	psi(bar)
Nozzle Diameter	
Pitot Pressure	
Flow	gpm

S = Satisfactory **U = Unsatisfactory**

Standpipe System ID	Date	Inspector	Task/Result	Notes

THE PORT AUTHORITY OF NY & NJ

STANDPIPE AND HOSE SYSTEMS
HOSE EQUIPMENT – INSPECTION / TESTING / MAINTENANCE

PA 4017 / 12-20

Building ID: **Standpipe System ID:**

- Use this form to document inspection of standpipe hose equipment.
- Record "S" to indicate a satisfactory result or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Hose Cabinets – Inspection – Annually – {Reference C2A16} – Cabinets shall be inspected annually for the following conditions:

1. Overall for corroded or damaged parts	2. Difficult to open	3. Cabinet door not opening fully
4. Door glazing cracked or broken	5. Lock on break glass–type cabinets not functioning properly	6. Glass break device missing or not attached
7. Not properly identified as containing fire equipment	8. Visible or physical obstructions	9. All valves, hose, nozzles, fire extinguishers, and so forth, easily accessible

2. Hose Storage Device – Inspection – Annually - {Reference C2A19} – Hose storage devices shall be inspected annually for the following conditions:

1. Difficult to operate.	2. Damaged.	3. Visible or physical obstruction.
4. Hose improperly racked or rolled.	5. Nozzle clip not in place and nozzle not correctly contained.	6. Hose rack enclosed in cabinet not swinging out at least 90 degrees.

3. Hose – Inspection – Annually – {Reference C2A17} – Hose shall be inspected annually for the following conditions as required by NFPA 1962:

1. Mildew, cuts, abrasions, and deterioration	2. Couplings hose threads damaged	3. Gaskets missing or deteriorated
4. Incompatible threads on coupling	5. Hose not connected to hose rack nipple or valve	6. Hose test outdated

4. Hose Nozzles – Inspection – Annually – {Reference C2A18} – Hose nozzles shall be inspected annually for the following conditions:

1. Hose nozzle missing	2. Gasket missing or deteriorated	3. Obstructions
4. Does not operate smoothly		

S = Satisfactory **U = Unsatisfactory**

Equipment ID (Description)	Date	Inspector	Task/Result	Notes

STANDPIPE AND HOSE SYSTEMS
PIPING, SIGNS, ALARM DEVICES, MAIN DRAIN – INSPECTION / TESTING / MAINTENANCE

PA 4018 / 12-20

Building ID:

- Use this form to document routine inspection, testing, and maintenance of standpipe system equipment.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Piping – Inspection – Annually – {Reference C2A12}** – Piping shall be inspected annually for the following conditions:
   (1) Damaged piping
   (2) Damaged control valves
   (3) Missing or damaged pipe support device (i.e., missing or damaged hanger or seismic brace)
   (4) Damaged supervisory signal initiating device

2. **Hydraulic Design Information Sign – Inspection – Annually – {Reference C2A9}** – The hydraulic design information sign for standpipe systems shall be inspected annually to verify that it is provided, attached securely, and legible.

3. **Waterflow Alarm Devices – Inspection – Quarterly – {Reference C2A20} –** Mechanical waterflow alarm devices, vane-type, paddle-type, and pressure switch-type waterflow alarm devices shall be inspected quarterly to verify that they are free of physical damage.

4. **Waterflow Alarm Devices – Testing/Maintenance – Quarterly/SemiAnnually – {Reference C2A20}** – Mechanical waterflow alarm devices, vane-type, paddle-type, and pressure switch-type waterflow alarm devices shall be tested quarterly.

5. **Main Drain Test – Testing – Quarterly/Annually – {Reference C2A23} -** A main drain test shall be conducted annually for each water supply lead-in to a building waterbased fire protection system to determine whether there has been a change in the condition of the water supply. In systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves, the main drain test of at least one system downstream of the device shall be conducted on a quarterly basis.
   - Record the static and residual water supply pressures as indicated on the lower pressure gauge in Notes. Open the main drain and allow water flow to stabilize and then close observing return to starting static pressure.

S = Satisfactory **U = Unsatisfactory**

Equipment ID (Description)	Date	Inspector	Task/Result	Notes

STANDPIPE SYSTEMS AND HOSE SYSTEMS
GAUGES – INSPECTION / TESTING / MAINTENANCE

PA 4019 / 12-20

Building ID:

- Use this form to document inspection and testing of standpipe system gauges.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Gauges – Inspection – Weekly/Monthly/Quarterly – {Reference C1A3} –** Identify and inspect gauges, as per jurisdictional requirements, to verify that they are operable and not physically damaged.

2. **Air Pressure Gauges – Inspection – Weekly/Monthly/Quarterly – {Reference C1A5}** – Identify and inspect gauges, as per jurisdictional requirements, that measure air, nitrogen, or any other gases in dry systems.

3. **Gauges – Replace –5 Years – {Reference C1A4} -** Identify and replace or test gauges not accurate to within 3% shall be recalibrated or replaced.

S = Satisfactory **U = Unsatisfactory**

Gauge ID/System ID	Date	Inspector	Task/Result	Notes

STANDPIPE AND HOSE SYSTEMS
HOSE VALVES/CONNECTIONS – INSPECTION / TESTING / MAINTENANCE

PA 4020 / 12-20

Building ID: **System ID:**

- Use this form to document testing/maintenance of standpipe system hose valves and connections.
- Record "S" to indicate a satisfactory result or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Hose Valves – Inspection – Quarterly – {Reference C2A13} – Hose valves shall be inspected quarterly to verify that the valves are in the following condition:

1. Hose caps are in place and not damaged.	2. Hose threads are not damaged.	3. Valve handles are present and not damaged.
4. Gaskets are not damaged or showing signs of deterioration.	5. No leaks are present.	6. Valves are not obstructed or otherwise not capable of normal operation.

2. Hose Valves – Testing/Maintenance – Annually/3 Years – {Reference C2A14}

- Class I and Class III standpipe system hose valves shall be tested annually by fully opening and closing the valves.
- Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems shall be tested every 3 years by opening and closing the valves.
- Hose valves that do not operate smoothly or open fully shall be lubricated, repaired, or replaced.

3. Hose Connections – Inspection – Annually – {Reference C2A15} - Hose connections shall be inspected annually for the following conditions:

1. Valve cap(s) missing or damaged	2. Fire hose connection damaged	3. Valve handles missing or damaged
4. Cap gaskets missing or deteriorated	5. Valve leaking	6. Visible and physical obstructions to hose connections
7. Pressure restricting device missing	8. Manual, semiautomatic, or dry standpipe valve does not operate smoothly	9. Valve threads damaged

S = Satisfactory **U = Unsatisfactory**

Hose Valve ID	Date	Inspector	Task/Result	Notes

STANDPIPE AND HOSE SYSTEMS
CONTROL VALVES – INSPECTION / TESTING / MAINTENANCE

PA 4021 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of control valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Control Valves – Inspection – Weekly/Monthly/Quarterly – {Reference C2A6}** – Identify and inspect control valves. The valve inspection shall verify that the valves are in the following condition:
   (1) In the normal open or closed position
   (2) Sealed, locked, or supervised
   (3) Accessible
   (4) Post indicator valves (PIVs) are provided with correct wrenches
   (5) Free from external leaks
   (6) Provided with applicable identification

2. **Control Valves – Testing and Maintenance – Annually – {Reference C2A7}** – Identify and perform routine testing and maintenance of each control valve by operating through its full range and returning to its normal position. Lubricate operating stems of outside screw and yoke valves.

3. **Control Valve – Supervisory Devices – Inspection – Quarterly – {Reference C2A8} –** Identify and inspect control valve supervisory alarm devices to verify that they are free of physical damage.

4. **Control Valve – Supervisory Devices – Testing – SemiAnnually – {Reference C2A8} –** Identify and test valve supervisory switches demonstrating a distinctive signal when the valve is moved from its normal position.

S = Satisfactory **U = Unsatisfactory**

Control Valve ID/System ID	Date	Inspector	Task/Result	Notes

STANDPIPE AND HOSE SYSTEMS
PRESSURE REGULATING VALVES – INSPECTION / TESTING / MAINTENANCE

PA 4022 / 12-20

Building ID:

- Use this form to document inspections of pressure reducing & relief valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Pressure Regulating Valves – Hose Connection/Hose Rack Assembly – Inspection – Annually – {Reference C2A10} –** Identify and conduct annual inspections of all valves to verify they are in the following condition:

Hose Connection Pressure-Regulating Devices.	**Hose Rack Assembly Pressure-Regulating Devices.**
(1) The handwheel is not broken or missing. (2) The outlet hose threads are not damaged. (3) No leaks are present. (4) The hose adapter and the cap are not missing.	(1) The handwheel is not missing or broken. (2) No leaks are present.

2. **Pressure Regulating Valves – Hose Connection/Hose Rack Assembly – Testing / Maintenance – Annually – {Reference C2A11}** – Identify and conduct a partial flow test adequate to move the valve from its seat.

3. **Pressure Regulating Valves – Hose Connection/Hose Rack Assembly – Testing/Maintenance – 5 Years – {Reference C2A11}** – Identify and conduct full flow test on all pressure regulating valves at 5-year intervals. Make adjustments, if required, as per manufacturer's instructions.

S = Satisfactory **U = Unsatisfactory**

Valve ID	Date	Inspector	Task/Result	Notes

CHAPTER 3 – FIRE SERVICE MAINS & APPURTENANCES

General Requirements for Fire Service Mains (applicable at all facilities)

FCNYS 2020 507.5.2	Inspection, Testing and Maintenance. Fire hydrant systems shall be subject to periodic tests as required by the fire code official. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, alterations and servicing shall comply with approved standards. Records of tests and required maintenance shall be maintained.
IFCNJ 2015 507.5.3	Private Fire Service Mains and Water Tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals: 1. Private fire hydrants of all types: Inspection annually and after each operation; flow test and maintenance annually. 2. Fire service main piping: Inspection of exposed, annually; flow test every 5 years. 3. Fire service main piping strainers: Inspection and maintenance after each use. Records of inspections, testing and maintenance shall be maintained.
NYCFC 2014 508.5.4	Obstructions. Posts, fences, vegetation, rubbish containers, vehicles and other items shall not be installed, planted, placed, parked or stored near fire hydrants, fire department connections or fire protection system control valves in a manner that would obscure the location of such fire hydrants, connections or valves, or that would hinder immediate access thereto by firefighting personnel.
FCNYS 2020 507.5.5	Clear Space Around Hydrants. A 3-foot (914 mm) clear space shall be maintained around the circumference of fire hydrants, except as otherwise required or approved.
NYCFC 2014 508.5.6	Physical protection. Where fire hydrants are subject to impact by motor vehicles, posts that comply with the requirements of the New York City Department of Environmental Protection shall be installed. Notwithstanding the requirements of FC508.5.5, these posts may be installed no less than 2 feet (610 mm) from the hydrant if they do not obstruct the use of a 24-inch (610-mm) wrench on the hydrant operating nut.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014	Supervision. A person holding a certificate of fitness for the following fire protection systems shall personally supervise the inspection, testing, servicing and other maintenance required by this code or the rules with respect to the system supervised by such certificate of fitness holder: 1. Sprinkler systems. 2. Standpipe systems. 3. Foam fire extinguishing systems. 4. Fire alarm systems. 5. Private fire hydrant systems. 6. Yard hydrant systems.

A. All Fire Service Mains and Appurtenances

A1. Existing Fire Hydrants, Hose Houses, Monitor Nozzles – General Information

Update **Form PA 4025**

Frequency – Annually

Review General Information Form for all Fire Hydrants, Hose Houses, and Monitor Nozzles, update as required.

A2. New or Altered Fire Hydrants, Hose Houses, Monitor Nozzles General Information

Update **Form PA 4025**

Frequency – As Required

Complete General Information Form for new Fire Hydrants, Hose Houses, and Monitor Nozzles or update General Information form for Fire Hydrants, Hose Houses, and Monitor Nozzles that have been altered to include repairs and/or modifications to components.

A3. Hose Houses

Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.2.2.7	Quarterly	Hose Houses. Hose houses shall be inspected quarterly for the following conditions: (1) Inaccessibility (2) Physical damage (3) Missing equipment	PA 4026
NFPA 25-2017 7.2.2.7.1		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A4. Fire Hose

Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.1.4	Annually	Fire hose shall be maintained in accordance with NFPA 1962.	

A5. Hydrants (Dry Barrel and Wall)

Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.2.2.4	Annually and after each operation	Dry Barrel and Wall Hydrants. Dry barrel and wall hydrants shall be inspected annually and after each operation for the following conditions: (1) Inaccessibility (2) Presence of water or ice in the barrel (could indicate a faulty drain, a leaky hydrant valve, or high groundwater table) (3) Improper drainage from barrel (4) Leaks in outlets or at top of hydrant (5) Cracks in hydrant barrel (6) Tightness of outlet caps (7) Worn outlet threads (8) Worn hydrant operating nut (9) Availability of operating wrench	PA 4030

NFPA 25-2017 7.2.2.4.1		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A6. Hydrants — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.3.2*	Annually	Hydrants shall be tested annually to ensure proper functioning.	PA 4030
NFPA 25-2017 A.7.3.2		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25-2017 7.3.2.1		Each hydrant shall be opened fully and water flowed until all foreign material has cleared.	
NFPA 25-2017 7.3.2.2		Flow shall be maintained for not less than 1 minute.	
NFPA 25-2017 7.3.2.3		After operation, dry barrel and wall hydrants shall be observed for proper drainage from the barrel.	
NFPA 25-2017 7.3.2.4		Full drainage shall take no longer than 60 minutes.	
NFPA 25-2017 7.3.2.5		Where soil conditions or other factors are such that the hydrant barrel does not drain within 60 minutes, or where the groundwater level is above that of the hydrant drain, the hydrant drain shall be plugged and the water in the barrel shall be pumped out.	
NFPA 25-2017 7.3.2.6		Dry barrel hydrants that are located in areas subject to freezing weather and that have plugged drains shall be identified clearly as needing pumping after operation.	

A7. Hydrants — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.4.2.1	Annually	Hydrants shall be lubricated annually to ensure that all stems, caps, plugs, and threads are in proper operating condition.	PA 4030
NFPA 25-2017 7.4.2.2*		Hydrants shall be kept free of snow, ice, or other materials and protected against mechanical damage so that free access is ensured.	
NFPA 25-2017 A.7.4.2.2		The intent of 7.4.2.2 is to maintain adequate space for use of hydrants during a fire emergency. The amount of space needed depends on the configuration as well as the type and size of accessory equipment, such as hose, wrenches, and other devices that could be used.	

A8. Monitor Nozzles — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.2.2.6	SemiAnnually	Monitor Nozzles. Monitor nozzles shall be inspected semiannually for the following conditions: (1) Leakage (2) Physical damage (3) Corrosion	PA 4027
NFPA 25-2017 7.2.2.6.1		Where any deficiency is noted, the appropriate corrective action shall be taken.	

A9. Monitor Nozzles (Range & Operation) — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.3.3.1	Annually	Monitor nozzles that are mounted on hydrants shall be tested as specified in 7.3.2. (See A6 above)	PA 4027
NFPA 25-2017 7.3.3.2		All monitor nozzles shall be oscillated and moved throughout their full range annually to ensure proper operability.	

A10. Monitor Nozzles — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.4.3	Annually	Monitor nozzles shall be lubricated annually to ensure proper operating condition.	PA 4027

A11. Mainline Strainers — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.2.2.3.1	As Required	Mainline strainers shall be inspected and cleaned after each system flow exceeding that of a nominal 2 in. (50 mm) orifice.	PA 4028
NFPA 25-2017 A.7.2.2.3		Any flow in excess of the flow through the main drain connection should be considered significant.	
NFPA 25-2017 7.2.2.3.2	Annually or As Required	Mainline strainers shall be removed and inspected annually for plugging, fouling, and damaged and corroded parts.	PA 4028

A12. Piping (Exposed) — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.2.2.1.1	Annually	Exposed piping shall be inspected annually.	PA 4028
NFPA 25-2017 7.2.2.1.2		Piping shall be inspected for the following conditions: (1) Leaks (2) Physical damage (3) Corrosion (4) Restraint methods	
NFPA 25-2017 7.2.2.1.2.1		Where any deficiency is noted, the appropriate corrective action shall be taken.	
NFPA 25-2017 7.2.2.1.3		Piping installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.	

A13. Piping (Exposed and Underground) — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.3.1*	5 Year	Underground and Exposed Piping Flow Tests. Underground and exposed piping shall be flow tested at minimum 5-year intervals.	PA 4028
NFPA 25-2017 A.7.3.1		Full flow tests of underground piping can be accomplished by methods including, but not limited to, flow through yard hydrants, fire department connections once the check valve has been removed, main drain connections, and hose connections. The flow test should be conducted in accordance with NFPA 291. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25-2017 7.3.1.1		Any flow test results that indicate deterioration of available waterflow and pressure shall be investigated to the complete satisfaction of the authority having jurisdiction to ensure that the required flow and pressure are available for fire protection.	
NFPA 25-2017 7.3.1.2		Where underground piping supplies individual fire sprinkler, standpipe, water spray, or foam-water sprinkler systems and there are no means to conduct full flow tests, tests generating the maximum available flows shall be permitted.	

A14. Obstruction Investigation — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 14.2.1*		An assessment of the internal condition of piping shall be conducted on a frequency determined by 14.2.1.1 or 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.	
NFPA 25 2017 A.14.2.1		It is the intent of this requirement to provide a reasonable assurance that corrosion and obstruction issues within fire protection systems are identified. It is not the intent to require verification that every piece of pipe in the system is free from corrosion and obstructions. An assessment of the internal condition of piping can be accomplished by several methods that meet the intent of this section. These methods include the following: (3) Private fire service mains. (a) Opening an accessible point on one main for the purpose of inspecting for the presence of foreign organic and inorganic material. i. When performing normal maintenance that involves draining down a system to modify a system such as for tenant fit out or building renovations, or when removing or replacing piping, this inspection can be performed as described and properly recorded at that time. The time interval would then start for the next assessment of that system at the frequency determined by 14.2.1.1 or 14.2.1.2. (b) Utilizing alternative examination methods such as the following: i. Using video inspection equipment that is inserted into the system at strategic points to observe the internal condition of pipes. This equipment provides a visual exam of the pipes using a camera and lighting system on the end of a push cable. Video inspection equipment can be inserted in alarm, dry, and preaction valves for a look into the private main depending on the system configuration. The push cable can also be inserted in a check valve when performing the five-year internal inspection required by 13.4.2.1 to view additional areas of a system, and in the fire department connection to perform the interior inspection required by 13.8.3. ii. Ultrasonic or similar technology that allows the pipe wall to be tested to determine the extent of any deterioration due to microbiologically influenced corrosion (MIC) or other forms of corrosion. This method would not typically be used for the internal inspection of piping required by this section because it might not detect the presence of solid material in the piping, such as wood, plastic, or other foreign obstructions, that are not a byproduct of corrosion, because only small representative sections of pipe are examined. iii. A laboratory analysis of water samples obtained from the fire protection system, combined with collecting and inspecting solid material from fire protection system water discharged from a main drain, and an inspector's test connection, can provide an indication of the presence of corrosion, MIC, and/or foreign materials. If a high level of MIC is identified, or if a significant amount of foreign materials is found, further investigation might be warranted to verify the extent of corrosion, MIC, or other obstructions in the system. The solid materials should be collected with an appropriately sized strainer. If inspection of the solid materials identifies excessive rust, black water color, or sulfur (rotten egg) odors, an obstruction investigation as described in Section 14.3 is warranted.	
NFPA 25 2017 14.2.1.1	5 Years	An assessment of the internal condition of piping shall be conducted at a minimum of every 5 years or in accordance with 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.	
NFPA 25 2017 14.2.1.2*		Where an assessment frequency has been established by an approved risk analysis, the assessment shall be performed at a frequency determined by the approved risk analysis.	
NFPA 25 2017 A.14.2.1.2		The purpose of the assessment of the internal condition of piping is to identify whether foreign organic and inorganic material is present, since the presence of such material can potentially be detrimental to the performance of the sprinkler system. Corrosion, which includes microbiologically influenced corrosion (MIC), can be prevalent in sprinkler piping, but not necessarily in all systems, buildings, or geographic locations. Therefore, the risk analysis should be based upon evidence noted and/or data obtained from proximate sprinkler systems, known problems from the water supply, as well as other factors that could affect the integrity of the system piping. The decision of when, how often, and which method to use to conduct an assessment should also consider the risk of emptying and refilling the sprinkler system with water, which could adversely impact the sprinkler system by introducing foreign or inorganic material into the sprinkler system.	

NFPA 25 2017 14.2.1.3		Tubercules or slime, if found, shall be tested for indications of microbiologically influenced corrosion (MIC).	
NFPA 25 2017 14.2.1.4*		If the presence of sufficient foreign organic or inorganic material is found to obstruct pipe or sprinklers, an obstruction investigation shall be conducted as described in Section 14.3.	
NFPA 25 2017 A.14.2.1.4		Most piping systems contain some foreign material or other evidence of corrosion but not sufficient to trigger an obstruction investigation. Furthermore, an internal inspection is primarily an inspection for determining corrosion of the pipe, but it can result in finding the presence of material that would be an obstruction to piping or sprinklers. If such is found, an obstruction investigation in Section 14.3 would be required.	
NFPA 25 2017 14.2.1.5		Nonmetallic pipe shall not be required to comply with Section 14.2.	
NFPA 25 2017 14.2.2*		In buildings having multiple wet pipe systems, every other system shall have an assessment of the internal condition of piping as described in 14.2.1.	
NFPA 25 2017 A.14.2.2		In large warehouses, high-rise buildings, and other buildings having multiple systems, it is reasonable to perform the assessment on half of the systems, and conclude that these are representative of all systems in the building. The systems in the building not assessed during one frequency cycle should be assessed during the next one. As long as there is no evidence of any foreign organic and/or inorganic material found in any of the systems being assessed, every other system would be assessed once every frequency cycle. However, if foreign organic and/or inorganic material is found in any system in the building during the frequency cycle, all systems must would then be assessed during that frequency cycle.	
NFPA 25 2017 14.2.2.1		During the next inspection frequency required by 14.2.1.1 or 14.2.1.2, the alternate systems not assessed during the previous assessment shall be assessed as described in 14.2.1.	
NFPA 25 2017 14.2.2.2		If foreign organic and/or inorganic material is found in any system in a building, all systems shall be assessed.	
NFPA 25 2017 14.3.1*		An obstruction investigation shall be conducted for system or yard main piping wherever any of the following conditions exist: (1) Defective intake for fire pumps taking suction from open bodies of water (2) The discharge of obstructive material during routine water tests (3) Foreign materials in fire pumps, in dry pipe valves, or in check valves (4) Foreign material in water during drain tests or plugging of inspector's test connection(s) (5) Unknown materials are heard in the system piping during draining, refilling, or otherwise flowing water through the system (6) Plugged sprinklers (7) The presence of sufficient foreign organic or inorganic material is found in the pipe (8) Failure to flush yard piping or surrounding public mains following new installations or repairs (9) A record of broken public mains in the vicinity (10) Abnormally frequent false tripping of a dry pipe valve(s) (11) A system that is returned to service after an extended shutdown (greater than 1 year) (12) There is reason to believe that the sprinkler system contains sodium silicate or highly corrosive fluxes in copper systems (13) A system has been supplied with raw water via the fire department connection (14) Pinhole leaks (15) A 50 percent increase in the time it takes water to travel to the inspector's test connection from the time the valve trips during a full flow trip test of a dry pipe sprinkler system when compared to the original system acceptance test	
NFPA 25 2017 A.14.3.1		Most piping systems contain some foreign material or other evidence of corrosion but not sufficient to trigger an obstruction investigation. Furthermore, an internal inspection is primarily an inspection for determining corrosion of the pipe, but it can result in finding the presence of material that would be an obstruction to piping or sprinklers. If such is found, an obstruction investigation in Section 14.3 would be required. For obstruction investigation procedures, see Section D.3. The type of obstruction investigation should be appropriately selected based on the observed condition. For instance, ordering an internal obstruction investigation would be inappropriate where the observed condition was broken public mains in the vicinity. On the other hand, such an investigation would be appropriate where foreign materials are observed in the dry pipe valve.	
NFPA 25 2017 14.3.2*		Systems shall be examined for internal obstructions where conditions exist that could cause obstructed piping.	
NFPA 25 2017 A.14.3.2		For obstruction prevention program recommendations, see Section D.4.	
NFPA 25 2017 D.4		Obstruction Prevention Program. Possibly include in an appendix or provide upon request.	

NFPA 25 2017 14.3.2.1		If the condition has not been corrected or the condition is one that could result in obstruction of the piping despite any previous flushing procedures that have been performed, the system shall be examined for internal obstructions every 5 years.	
NFPA 25 2017 14.3.2.2*		Internal examination shall be performed at the following minimum four points: (1) System valve (2) Riser (3) Cross main (4) Branch line	
NFPA 25 2017 A.14.3.2.2		The indicated locations are presented as the minimum basis for determining the need for the initiation of a more extensive obstruction investigation effort. Additional points of examination can be appropriately dictated to assess the extent and severity of the obstructing material as determined by the observed conditions at these locations. See Section D.3 for further discussion.	
NFPA 25 2017 D.3		Investigation Procedures. Possibly include in an appendix or provide upon request.	
NFPA 25 2017 14.3.2.3*		Alternative nondestructive examination methods shall be permitted.	
NFPA 25 2017 A.14.3.2.3		Alternative examination methods can include the following: (1) Using video inspection equipment that is inserted into the system at strategic points to observe the internal condition of pipes. This equipment provides a visual exam of the pipes using a camera and lighting system on the end of a push cable. Video inspection equipment can be inserted in alarm, dry, and preaction valves, in the risers, and into cross mains and branch lines, depending on the system configuration. This equipment can also be used to determine the results of any flushing that was performed. (2) Ultrasonic or similar technology that allows the pipe wall to be externally tested to determine the extent of any deterioration due to MIC or other forms of corrosion. This method has advantages including allowing the system to be left in service while performing the examination, and pinpointing where pipes are about to fail before the actual failure occurs, allowing preventive action to be taken. This technology does have its limitations, and to be thorough all pipes would require access, even those in concealed spaces such as those above ceilings. This technology can detect the presence of a buildup of sludge, scale, or other by-products of corrosion, and can detect existing air pockets in wet systems as well as trapped sections of pipe in dry systems that aren't adequately drained. This technology cannot detect the presence of MIC itself, but can detect tubercules caused by MIC. In most cases this technology will not detect the presence of solid material in the piping such as wood, plastic, or other foreign obstructions that are not a by-product of corrosion, because only small representative sections of pipe are examined.	
NFPA 25 2017 14.3.3*		If an obstruction investigation indicates the presence of sufficient material to obstruct pipe or sprinklers, a complete flushing program shall be conducted by qualified personnel.	
NFPA 25 2017 A.14.3.3		For obstruction investigation flushing procedures, see Section D.5.	
NFPA 25 2017 D.5		Flushing Procedures. Possibly include in an appendix or provide upon request.	
NFPA 25 2017 14.3.4		Tubercules or slime, if found during an obstruction investigation, shall be tested for indications of microbiologically influenced corrosion (MIC).	
NFPA 25 2017 14.4.		Ice Obstruction. Dry pipe or preaction sprinkler system piping that protects or passes through refrigerated spaces maintained at temperatures below 32°F (0°C) shall be inspected internally on an annual basis for ice obstructions at the point where the piping enters the refrigerated area.	
NFPA 25 2017 14.4.1		Alternative nondestructive examinations shall be permitted.	
NFPA 25 2017 14.4.2		All penetrations into the refrigerated spaces shall be inspected and, if an ice obstruction is found, additional pipe shall be examined to ensure that no additional ice obstructions or ice blockages exist.	

B. Component Action Requirements

B1. Component Action Requirements — Adjusted / Repaired Reconditioned / Replaced

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25-2017 7.5.1	As Required	Whenever a component in a private fire service system is adjusted, repaired, reconditioned, or replaced, the action required in Table 7.5.1 shall be performed.	
NFPA 25-2017 7.5.2		Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.	
NFPA 25-2017 7.5.3*		Where a main drain is not provided, other equivalent means of flow testing shall be permitted.	
NFPA 25-2017 A.7.5.3		Private fire service mains might not include a main drain connection; therefore, other equivalent means of flow such as an installed fire hydrant can be used.	
NFPA 25-2017 7.5.4		The actions of 7.5.1 shall not require a design review, which is outside the scope of this standard.	

Table 7.5.1 Summary of Component Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Test Criteria
Water Delivery Components				
Pipe and fittings (exposed)	X	X	X	Hydrostatic test in conformance with NFPA 24
Pipe and fittings (underground)				Flush in conformance with NFPA 24 or NFPA 20, as appropriate
Hydrants	X	X	X	Hydrostatic test in conformance with NFPA 24
				Waterflow in conformance with NFPA 24
				Inspect for proper drainage
Monitor nozzles	X	X	X	Hydrostatic test in conformance with NFPA 24
				Flush in conformance with NFPA 24
Mainline strainers	X	X	X	Flow test downstream of strainer
Fire department connection	X	X	X	See Chapter 13
Alarm and Supervisory Components				
Valve supervisory device	X	X	X	Operational test for conformance with NFPA 24 and/or *NFPA 72*
System-Indicating Components				
Gauges			X	Verify at 0 psi (0 bar) and system working pressure
System Housing and Protection Components				
Hose houses	X	X	X	Verify integrity of hose house and hose house components
Hose		X		Repair and test hose in accordance with NFPA 1962
Hose			X	No action required
Structural Components				
Thrust blocks	X	X	X	Test at system working pressure
Tie rods	X	X	X	Test at system working pressure
Retainer glands	X	X	X	Test at system working pressure
Informational Components				
Identification signs	X	X	X	Verify conformance with NFPA 24

FIRE SERVICE MAINS
GENERAL INFORMATION – FIRE HYDRANTS

System ID: **Total Number of Fire Hydrants:**

- Hydrant descriptions include but is not limited to: wall hydrant, dry barrel hydrant, underground hydrant, etc.
- Provide any additional pertinent information in Notes including but not limited to: thread type, location of shutoff valve, impact protection, etc.
- Provide additional documentation as needed.

Hydrant ID / Description	Manufacturer / Model #	Number & Size of Outlets	Location	Notes

FIRE SERVICE MAINS **PA 4025 / 12-20**
GENERAL INFORMATION – HOSE HOUSES / MONITOR NOZZLES

System ID: **Total Number of Hose Houses / Monitor Nozzles:**

- Provide any additional pertinent information in Notes including but not limited to: type of hose and lengths, thread type, oscillating, automatic, etc.
- Provide additional documentation as needed.

Hose House ID / Monitor Nozzle ID	Manufacturer / Model #	Nozzle Size	Location	Notes

FIRE SERVICE MAINS
HOSE HOUSES – INSPECTION

PA 4026 / 12-20

Building ID: **System ID:**

- Use this form to document inspections of hose houses.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Hose Houses – Inspection – Quarterly – {Reference C3A3}** – Identify and inspect each hose house quarterly to make sure they are accessible, not damaged, and all equipment is present.

S = Satisfactory **U = Unsatisfactory**

Hose House ID	Date	Inspector	Result	Notes

FIRE SERVICE MAINS
MONITOR NOZZLES – INSPECTION / TESTING / MAINTENANCE

PA 4027 / 12-20

Building ID: **System ID:**

- Use this form to document inspections of monitor nozzles.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Monitor Nozzles – Inspection – SemiAnnually – {Reference C3A8}** – Identify and inspect each monitor nozzle semiannually for the following conditions:
   (1) Leakage
   (2) Physical damage
   (3) Corrosion

2. **Monitor Nozzles – Testing – Annually – {Reference C3A9}** – Identify and test each monitor nozzle annually to demonstrate oscillation/movement through their full range to ensure proper operability.

3. **Monitor Nozzles – Maintenance – Annually – {Reference C3A10}** – Identify and lubricate each monitor nozzle annually to ensure proper operating condition.

S = Satisfactory **U = Unsatisfactory**

Monitor Nozzle ID	Date	Inspector	Task/Result	Notes

FIRE SERVICE MAINS
STRAINERS/PIPING – INSPECTION / TESTING / MAINTENANCE

PA 4028 / 12-20

Building ID: **System ID:**

- Use this form to document inspection, testing, and maintenance of strainers and piping.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Main Line Strainers – Inspection/Maintenance – Annually or As Required – {Reference C3A11}** – Mainline strainers shall be removed and inspected annually for plugging, fouling, and damaged and corroded parts. Additionally, inspect and clean after each system flow exceeding that of a nominal 2 in. (50 mm) orifice.

2. **Exposed Piping – Inspection – Annually – {Reference C3A12}** – Exposed piping shall be inspected annually for the following conditions:
   (1) Leaks
   (2) Physical damage
   (3) Corrosion
   (4) Restraint methods

3. **Piping (Exposed and Underground) – Testing – 5 Years – {Reference C3A13}** – Conduct flow tests of underground and exposed piping at minimum 5-year intervals. Full flow tests of underground piping can be accomplished by methods including, but not limited to, flow through yard hydrants, fire department connections once the check valve has been removed, main drain connections, and hose connections. The flow test should be conducted in accordance with NFPA 291. Use form PA 5027 to record results of flow test.

S = Satisfactory **U = Unsatisfactory**

Strainer / Piping (define strainer/piping)	Date	Inspector	Task/Result	Notes

THE PORT AUTHORITY OF NY & NJ

FIRE SERVICE MAINS
SYSTEM PIPING FLOW TEST

PA 4029 / 12-20

Building ID: **System ID:**

- Use this form to document flow tests of fire service main system piping.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

Location map: Provide drawing or sketch showing line sizes and distance to next cross-connected line. Show valves and hydrant branch size. Indicate north. Show and label location of flow and residual hydrants.

Residual hydrant location:	
Flow hydrant location:	
Nozzle size (flow hydrant):	
Nozzle coefficient (flow hydrant):	
Static pressure (residual hydrant):	**psi (bar)**
Residual pressure (residual hydrant):	**psi (bar)**
Pitot pressure (flow hydrant):	**psi (bar)**
Volume of Water Flowed	**gpm**
Projected Water Flow at 20 psi	**gpm**

Notes:

FIRE SERVICE MAINS
FIRE HYDRANTS – INSPECTION / TESTING / MAINTENANCE

PA 4030 / 12-20

Building ID: **System ID:**

- Use this form to document inspection, testing, and maintenance of fire hydrants.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Hydrants – Inspection – Annually & after each Operation – {Reference C3A5}** – Identify and inspect each hydrant for the following conditions:
   (1) Inaccessibility
   (2) Presence of water or ice in the barrel (could indicate a faulty drain, a leaky hydrant valve, or high groundwater table)
   (3) Improper drainage from barrel
   (4) Leaks in outlets or at top of hydrant
   (5) Cracks in hydrant barrel
   (6) Tightness of outlet caps
   (7) Worn outlet threads
   (8) Worn hydrant operating nut
   (9) Availability of operating wrench

2. **Hydrants – Testing – Annually – {Reference C3A6} –** Identify and test each hydrant confirming:
   - Each hydrant shall be opened fully and water flowed until all foreign material has cleared.
   - Flow shall be maintained for not less than 1 minute.
   - After operation, dry barrel and wall hydrants shall be observed for proper drainage from the barrel.
   - Full drainage shall take no longer than 60 minutes.

3. **Hydrants – Maintenance – Annually – {Reference C3A7}** – Lubricate ensure that all stems, caps, plugs, and threads are in proper operating condition

S = Satisfactory **U = Unsatisfactory**

Hydrant ID	Date	Inspector	Task/Result	Notes

CHAPTER 4 – FIRE PUMP SYSTEMS

General Requirements for Fire Pump Systems (applicable at all facilities)

IFCNJ 2015 913.3	Temperature of Pump Room. Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).
FCNYS 2020 913.3.1	Engine Manufacturer's Recommendation. Temperature of the pump room, pump house or area where engines are installed shall never be less than the minimum recommended by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.
IFCNJ 2015 913.5	Testing and Maintenance. Fire pumps shall be inspected, tested and maintained in accordance with the requirements of this section and NFPA 25. Records of inspection, testing and maintenance shall be maintained.
FCNYS 2020 913.5.2	Generator Sets. Engine generator sets supplying emergency or standby power to fire pump assemblies shall be periodically tested in accordance with NFPA 110. Records of testing shall be maintained.
IFCNJ 2015 913.5.3	Transfer Switches. Automatic transfer switches shall be periodically tested in accordance with NFPA 110. Records of testing shall be maintained.
NYCFC 2014 913.5.4	Pump room environmental conditions. Tests of pump room environmental conditions, including heating, ventilation and illumination shall be made to ensure proper manual or automatic operation of the associated equipment.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 913.5	Operation and maintenance. Fire pumps shall be operated and maintained in compliance with the requirements of this section, FC901.6 and NFPA 25, including all required inspection, testing and servicing.
NYCFC 2014 913.5.2	Generator sets. Engine generator sets supplying emergency power to fire pump assemblies shall be periodically tested in accordance with FC604 and the Electrical Code.
NYCFC 2014 913.5.3	Transfer switches. Automatic transfer switches shall be periodically tested in accordance with FC604 and the Electrical Code.
NYCFC 2014 913.6	Fire pump supervision. The following fire pump operations shall be electrically supervised by the fire alarm system in accordance with the Electrical Code and NFPA 20; and monitored by a central station in accordance with this code and the rules: 1. Pump running. 2. Pump power failed. 3. Pump phase reversal.

A. All Fire Pumps

A1. Existing Fire Pumps General Information — Update — Form PA 4032

Frequency – Annually

Review General Information Form for all Fire Pump Systems, update as required.

A2. New or Altered Fire Pumps General Information — Update — Form PA 4032

Frequency – As Required

Complete General Information Form for new Fire Pump Systems or update General Information form for Fire Pump Systems that have been altered to include repairs and/or modifications to components.

A3. Fire Pump System — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 913.3		Temperature of Pump Room. Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).	
NFPA 25 2017 8.2.1		The purpose of inspection shall be to verify that the pump assembly appears to be in operating condition and is free from physical damage.	
NFPA 25 2017 8.2.2	Weekly	The pertinent visual observations specified in the following checklists shall be performed weekly: (1) Pump house conditions are determined as follows: (a) Heat is adequate, not less than 40°F (4.0°C) for pump room with electric motor or diesel engine–driven pumps with engine heaters. (b) Heat is adequate, not less than 70°F (21°C) for pump room with diesel engine–driven pumps without engine heaters. (c) Ventilating louvers are free to operate. (d) Excessive water does not collect on the floor. (e) Coupling guard is in place. (2) Pump system conditions are determined as follows: (a) Pump suction and discharge and bypass valves are fully open. (b) Piping is free of leaks. (c) Suction line pressure gauge reading is within acceptable range. (d) System line pressure gauge reading is within acceptable range. (e) Suction reservoir has the required water level. (f) Wet pit suction screens are unobstructed and in place. (g) Waterflow test valves are in the closed position, the hose connection valve is closed, and the line to test valves is free of water. (3) Electrical system conditions are determined as follows: (a) Controller pilot light (power on) is illuminated. (b) Transfer switch normal pilot light is illuminated. (c) Isolating switch is closed — standby (emergency) source. (d) Reverse phase alarm pilot light is off, or normal phase rotation pilot light is on. (e) Oil level in vertical motor sight glass is within acceptable range. (f) Power to pressure maintenance (jockey) pump is provided. (4) Diesel engine system conditions are determined as follows: (a) Fuel tank is at least two-thirds full. (b) Controller selector switch is in auto position. (c) Batteries' (2) voltage readings are within acceptable range. (d) Batteries' (2) charging current readings are within acceptable range. (e) Batteries' (2) pilot lights are on or battery failure (2) pilot lights are off. (f) All alarm pilot lights are off. (g) Engine running time meter is reading. (h) Oil level in right angle gear drive is within acceptable range. (i) Crankcase oil level is within acceptable range. (j) Cooling water level is within acceptable range. (k) Electrolyte level in batteries is within acceptable range. (l) Battery terminals are free from corrosion. (m) Water-jacket heater is operating.	PA 4033
NFPA 25 2017 A.8.2.2		See Table A.8.2.2 and Figure A.8.2.2.	

NFPA 25 2017 Table A.8.2.2

Table A.8.2.2 Observations — Before Pumping

Item	Before Pump Is Operated
Horizontal pumps	1. Inspect drip pockets under packing glands for proper drainage. Standing water in drip pockets is the most common cause of bearing failure. 2. Inspect packing adjustment — approximately one drop per second is necessary to keep packing lubricated. 3. Observe suction and discharge gauges. Readings higher than suction pressure indicate leakage back from system pressure through either the fire pump or jockey pump.

NFPA 25 2017 Figure A.8.2.2

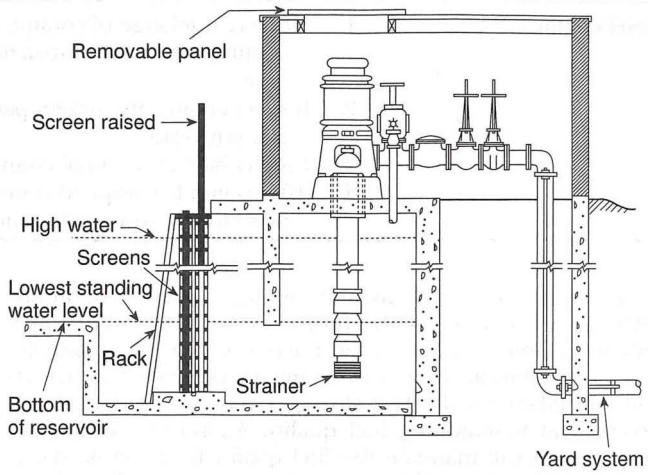


FIGURE A.8.2.2 Wet Pit Suction Screen Installation.

A4. Fire Pump — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.1.1.2.1*	Annually	Shaft movement or end play shall be checked (inspected) annually with the pump operating.	PA 4034 Page 1 of 3
NFPA 25 2017 A.8.1.1.2.1		Shaft movement should be less than 1⁄8 in. (3 mm).	
NFPA 25 2017 8.1.1.2.2	Annually	Electrical connections shall be checked annually and repaired as necessary to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.	PA 4034 Page 1 of 3
NFPA 25 2017 8.1.1.2.3	Annually	Pump and motor bearings and couplings shall be greased annually or as required.	PA 4034 Page 1 of 3
NFPA 25 2017 8.1.1.2.4	Annually	Printed circuit boards (PCBs) shall be checked annually for corrosion to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.	PA 4034 Page 1 of 3
NFPA 25 2017 8.1.1.2.5	Annually	Cable and/or wire insulation shall be checked annually for cracking to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.	PA 4034 Page 1 of 3
NFPA 25 2017 8.1.1.2.6	Annually	Plumbing parts, both inside and outside of electrical panels, shall be checked annually for any leaks to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.	PA 4034 Page 1 of 3
NFPA 25 2017 8.1.1.2.7	Quarterly	Fuel tanks, float switches, and supervisory signals for interstitial space shall be checked quarterly for liquid intrusion.	PA 4034 Page 1 of 3
NFPA 25 2017 8.1.1.2.8	Annually	Supervisory signal circuitry shall be checked annually for high cooling water temperature.	PA 4034 Page 1 of 3
NFPA 25 2017 8.1.1.2.9	Annually	Fuel tanks shall be checked annually for water and foreign materials.	PA 4034 Page 2 of 3

NFPA 25 2017 8.1.1.2.10	Annually	Fuel tank vents and overflow piping shall be checked annually for any obstructions.	PA 4034 Page 2 of 3
NFPA 25 2017 8.1.1.2.11	Annually	All flexible hoses and connections shall be checked annually for cracks and leaks.	PA 4034 Page 2 of 3
NFPA 25 2017 8.1.1.2.12	Annually	Engine crankcase breathers shall be checked annually.	PA 4034 Page 2 of 3
NFPA 25 2017 8.1.1.2.13	Annually	Exhaust systems, drain condensate traps, and silencers shall be checked annually.	PA 4034 Page 2 of 3
NFPA 25 2017 8.1.1.2.14	Annually	Back pressure on the engine turbos shall be measured annually.	PA 4034 Page 2 of 3
NFPA 25 2017 8.1.1.2.15	Annually	Batteries shall be checked annually as follows: (1) Checking the specific gravity, state of charge, and charger rates of the batteries (2) Cleaning the terminals of any corrosion. (3) Ensuring that the cranking voltage exceeds 9 V on a 12 V system or 18 V on a 24 V system (4) Ensuring that only distilled water is used in batteries	PA 4034 Page 2 of 3
NFPA 25 2017 8.1.1.2.16	Annually	All controls and power wiring connections shall be checked annually and repaired as necessary to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.	PA 4034 Page 3 of 3
NFPA 25 2017 8.1.1.2.17	Annually	Lubricating oil in engines shall be changed every 50 hours of operation or annually.	PA 4034 Page 3 of 3
NFPA 25 2017 8.1.1.2.18	Annually	Lubricating oil filters shall be changed every 50 hours of operation or annually.	PA 4034 Page 3 of 3
NFPA 25 2017 8.1.1.2.19	Annually	The condition of sacrificial anodes shall be checked annually and replaced as necessary.	PA 4034 Page 3 of 3
NFPA 25 2017 8.1.1.2.20	Annually	Circulating water filters shall be replaced annually.	PA 4034 Page 3 of 3
NFPA 25 2017 8.1.1.2.21	Annually	The accuracy of pressure gauges and sensors shall be inspected annually and replaced or recalibrated when more than 5 percent out of calibration to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.	PA 4034 Page 3 of 3
NFPA 25 2017 8.3.6.4*	Annually	Parallel and angular alignment of the pump and driver shall be inspected during the annual test, and any misalignment shall be corrected.	PA 4034 Page 3 of 3
NFPA 25 2017 A.8.3.6.4		If pumps and drivers were shipped from the factory with both machines mounted on a common baseplate, they were accurately aligned before shipment. All baseplates are flexible to some extent and, therefore, must not be relied on to maintain the factory alignment. Realignment is necessary after the complete unit has been leveled on the foundation and again after the grout has set and foundation bolts have been tightened. The alignment should be inspected after the unit is piped and reinspected periodically. To facilitate accurate field alignment, most manufacturers either do not dowel the pumps or drivers on the baseplates before shipment or, at most, dowel the pump only. After the pump and driver unit has been placed on the foundation, the coupling halves should be disconnected. The coupling should not be reconnected until the alignment operations have been completed. The purpose of the flexible coupling is to compensate for temperature changes and to permit end movement of the shafts without interference with each other while transmitting power from the driver to the pump. There are two forms of misalignment between the pump shaft and the driver shaft: (1) Angular misalignment. Shafts with axes concentric but not parallel (2) Parallel misalignment. Shafts with axes parallel but not concentric The faces of the coupling halves should be spaced within the manufacturer's recommendations and far enough apart so that they cannot strike each other when the driver rotor is moved hard over toward the pump. Due allowance should be made for wear of the thrust bearings. The necessary tools for an approximate inspection of the alignment of a flexible coupling are a straight edge and a taper gauge or a set of feeler gauges. A check for angular alignment is made by inserting the taper gauge or feelers at four points between the coupling faces and comparing the distance between the faces at four points spaced at 90 degree intervals around the coupling [see Figure A.8.3.6.4(a)]. The unit will be in angular alignment when the measurements show that the coupling faces are the same distance apart at all points.	

		A check for parallel alignment is made by placing a straight edge across both coupling rims at the top, bottom, and at both sides [see Figure A.8.3.6.4(b)]. The unit will be in parallel alignment when the straight edge rests evenly on the coupling rim at all positions. Allowance might be necessary for temperature changes and for coupling halves that are not of the same outside diameter. Care must be taken to have the straight edge parallel to the axes of the shafts. Angular and parallel misalignment are corrected by means of shims under the motor mounting feet. After each change, it is necessary to recheck the alignment of the coupling halves. Adjustment in one direction might disturb adjustments already made in another direction. It should not be necessary to adjust the shims under the pump. The permissible amount of misalignment will vary with the type of pump and driver; and coupling manufacturer, model, and size. [20: A.6.5]	

A5. No-Flow Fire Pump Testing General Requirements — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 A.8.3		The purpose of testing the pump assembly is to ensure automatic or manual operation upon demand and continuous delivery of the required system output. An additional purpose is to detect deficiencies of the pump assembly not evident by inspection.	
NFPA 25 2017 8.3.2.1		A no-flow test of fire pump assemblies shall be conducted in accordance with 8.3.2.	
NFPA 25 2017 8.3.2.1.1		Except as permitted in 8.3.2.1.2 and 8.3.2.1.3, a main pressure relief valve (where installed) shall be permitted to weep but not discharge a significant quantity of water.	
NFPA 25 2017 8.3.2.1.1.1		Except as required in 8.3.2.1.1.2, the circulation relief valve shall discharge a small flow of water.	
NFPA 25 2017 8.3.2.1.1.2		The circulation relief valve shall not operate when the flow through the main pressure relief valve is greater than weeping.	
NFPA 25 2017 8.3.2.1.2		For fire pump installations that were installed under a standard (1993 and earlier editions of NFPA 20) that did not prohibit a design that required operation of a pressure relief valve to keep the discharge pressure below the rating of the system components, the pressure relief valve shall be permitted to operate as designed during a no-flow test.	
NFPA 25 2017 8.3.2.1.2.1*		The pressure readings on the discharge and suction gauges shall be recorded, and a pressure difference that is greater than 95 percent of the rated pump pressure shall be investigated and corrected.	
NFPA 25 2017 A.8.3.2.1.2.1		An excessive pressure differential might indicate that the pressure relief valve is wide open and not properly regulating the pressure. Excessively high flow rates through the pressure relief valve can cause failure of the fire protection system and can overload a diesel engine drive and result in destruction of the engine.	
NFPA 25 2017 8.3.2.1.2.2*		The discharge temperature of the water shall be monitored and the pump shut down if necessary to prevent exposing the pump and/or driver to excessive temperatures.	
NFPA 25 2017 A.8.3.2.1.2.2		High water temperatures can cause diesel engines to overheat and fail.	
NFPA 25 2017 8.3.2.1.3		For positive displacement pumps, the pressure relief valve shall operate during a no-flow test.	
NFPA 25 2017 8.3.2.1.3.1		Where the pressure relief valve is piped back to suction, the pump circulation relief valve shall not operate.	
NFPA 25 2017 8.3.2.1.3.2		On electric motor and radiator cooled engine drives, a circulation pressure relief valve located downstream of the main pressure relief valve shall discharge sufficient water to prevent overheating of the pump.	
NFPA 25 2017 8.3.2.2		The test shall be conducted by starting the pump automatically.	
NFPA 25 2017 8.3.2.5		A valve installed to open as a safety feature shall be permitted to discharge water.	
NFPA 25 2017 8.3.2.6		An automatic timer that meets 8.3.2.6.1 through 8.3.2.6.3 shall be permitted to be substituted for the starting procedure.	
NFPA 25 2017 8.3.2.6.1		A solenoid valve drain on the pressure control line shall be the initiating means for a pressure-actuated controller.	
NFPA 25 2017 8.3.2.6.2		In a pressure-actuated controller, performance of this program timer shall be recorded as a pressure drop indication on the pressure recorder.	
NFPA 25 2017 8.3.2.6.3		In a non-pressure-actuated controller, the test shall be permitted to be initiated by means other than a solenoid valve.	

NFPA 25 2017 8.3.2.7		Qualified personnel shall be in attendance whenever the pump is in operation.	
NFPA 25 2017 8.3.2.7.1*		The use of the automatic timer allowed in 8.3.2.6 shall not eliminate the requirement of 8.3.2.7 to have qualified personnel present during the test.	
NFPA 25 2017 A.8.3.2.7.1		An automatic timer allows a person who has been instructed on what to watch for and record during this test to monitor the test and request assistance should any issues arise.	
NFPA 25 2017 8.3.2.8		The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is idle: (1) Record the system suction and discharge pressure gauge readings. (2) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log where such information is available without having to open an energized electric motor–driven fire pump controller. (3) If the highest or lowest pressure is outside of the expected range, record all information from the event log that helps identify the abnormality.	
NFPA 25 2017 8.3.2.9*		The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running: (1) Pump system procedure is as follows: (a) Record the pump starting pressure from the pressure switch or pressure transducer. (b) Record the system suction and discharge pressure gauge readings. (c) Inspect the pump packing glands for slight discharge. (d) Adjust gland nuts if necessary. (e) Inspect for unusual noise or vibration. (f) Inspect packing boxes, bearings, or pump casing for overheating. (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge. (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log. (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water. (2) Electrical system procedure is as follows: (a) Observe the time for motor to accelerate to full speed. (b) Record the time controller is on first step (for reduced voltage or reduced current starting). (c) Record the time pump runs after starting (for automatic stop controllers). (3) Diesel engine system procedure is as follows: (a) Observe the time for engine to crank. (b) Observe the time for engine to reach running speed. (c) Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running. (d) Record any abnormalities. (e) Inspect the heat exchanger for cooling waterflow.	
NFPA 25 2017 A.8.3.2.9		See Table A.8.3.2.9.	
NFPA 25 2017 Table A.8.3.2.9		**Table A.8.3.2.9 Observations — While Pumping** **Item** / **While Pump Is Operating** Horizontal pumps: 1. Read suction and discharge gauges — difference between these readings indicates churn pressure, which should match churn pressure as shown on fire pump nameplate. 2. Observe packing glands for proper leakage for cooling of packing. 3. Observe discharge from casing relief valve — adequate flow keeps pump case from overheating. Vertical pumps: 1. Read discharge gauge — add distance to water level in feet (or meters) and divide by 2.31 to compute psi (30.47 to compute bar). This total must match churn pressure as shown on fire pump nameplate. 2. Observe packing glands for proper leakage for cooling of packing. 3. Observe discharge from casing relief valve — adequate flow keeps pump case from overheating. Diesel engines: 1. Observe discharge of cooling water from heat exchanger — if not adequate, inspect strainer in cooling system for obstructions. If still not adequate, adjust pressure-reducing valve for correct flow. 2. Inspect engine instrument panel for correct speed, oil pressure, water temperature, and ammeter charging rate. 3. Inspect battery terminal connections for corrosion and clean if necessary. 4. After pump has stopped running, inspect intake screens, if provided; replace diesel system pressure recorder chart; and rewind if necessary.	

A6. Fire Pump System – Annual Flow Testing Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.3.3.1*	Annually	An annual test of each pump assembly shall be conducted by qualified personnel under no-flow (churn), rated flow, and 150 percent of the pump rated capacity flow of the fire pump by controlling the quantity of water discharged through approved test devices.	PA 4038 PA 4039
NFPA 25 2017 A.8.3.3.1		Minimum flow for a pump is the churn pressure.	
NFPA 25 2017 8.3.3.1.1		If available suction supplies do not allow flowing of 150 percent of the rated pump capacity, the fire pump shall be tested to the maximum allowable discharge.	
NFPA 25 2017 8.3.3.6		The annual test shall be conducted as follows: (1) The arrangement described in 8.3.3.6.1 or 8.3.3.6.2 shall be used at a minimum of every third year. (2) *The arrangement described in 8.3.3.6.3 shall be permitted to be used two out of every three years.	
NFPA 25 2017 A.8.3.3.6(2)		The method described in 8.3.3.6.3 is not considered as complete as those in 8.3.3.6.1 and 8.3.3.6.2, because it does not test the adequacy of the water supply for compliance with the requirements of 8.1.6 at the suction flange.	
NFPA 25 2017 8.3.3.6.1		Use of Pump Discharge via Hose Streams.	
NFPA 25 2017 8.3.3.6.1.1		Pump suction and discharge pressures and the flow measurements of each hose stream shall determine the total pump output.	
NFPA 25 2017 8.3.3.6.1.2*		Care shall be taken to minimize any water damage caused by the high volume of water discharging during the test.	
NFPA 25 2017 A.8.3.3.6.1.2		Whether using a play pipe, water diffuser, or other discharge device, damage can be caused by the water stream, or can be caused by inadequate drainage in the area of the discharge.	
NFPA 25 2017 8.3.3.6.2		Use of Pump Discharge via Bypass Flowmeter to Drain or Suction Reservoir. Pump suction and discharge pressures and the flowmeter measurements shall determine the total pump output.	
NFPA 25 2017 8.3.3.6.3		Use of Pump Discharge via Bypass Flowmeter to Pump Suction (Closed-Loop Metering).	
NFPA 25 2017 8.3.3.6.3.1		Pump suction and discharge pressures and the flowmeter measurements shall determine the total pump output.	
NFPA 25 2017 8.3.3.6.3.2		When testing includes recirculating water back to the fire pump suction, the temperature of the recirculating water shall be monitored to verify that it remains below temperatures that could result in equipment damage as defined by the pump and engine manufacturers.	
NFPA 25 2017 8.3.3.6.3.3		If the test results are not consistent with the previous annual test, the test shall be repeated using the test arrangement described in 8.3.3.6.1.	
NFPA 25 2017 8.3.3.6.3.4		If testing in accordance with 8.3.3.6.1 is not possible, a flowmeter calibration shall be performed and the test shall be repeated.	
NFPA 25 2017 8.3.3.7		The pertinent visual observations, measurements, and adjustments specified in the following checklists shall be conducted annually while the pump is running and flowing water under the specified output condition: (1) At no-flow condition (churn), the procedure is as follows: (a) Inspect the circulation relief valve for operation to discharge water. (b) Inspect the pressure relief valve (if installed) for proper operation. (2) At each flow condition, the procedure is as follows: (a) Where an external means is provided on the controller, record the electric motor voltage and current (all lines). (b) Record the pump speed in rpm. (c) Record the simultaneous (approximately) readings of pump suction and discharge pressures and pump discharge flow. (3) For electric motor–driven pumps, do not shut down the pump until it has run for 10 minutes. (4) For diesel motor–driven pumps, do not shut down the pump until it has run for 30 minutes.	

NFPA 25 2017 A.8.3.3.7(3)		It is not the intent to discharge water for the full 1-hour test duration, provided all flow tests can be conducted in less time and efforts are taken to prevent the pump from overheating.	
NFPA 25 2017 8.3.3.8*		For installations having a pressure relief valve, the operation of the relief valve shall be closely observed during each flow condition to determine whether the pump discharge pressure exceeds the normal operating pressure of the system components.	
NFPA 25 2017 A.8.3.3.8		A pressure relief valve that opens during a flow condition is discharging water that is not measured by the recording device(s). It can be necessary to temporarily close the pressure relief valve to achieve favorable pump test results. At the conclusion of the pump test, the pressure relief valve must be readjusted to relieve pressures in excess of the normal operating pressure of the system components. If the pressure relief valve is open during the flowing conditions due to the fact that the pressure is too high for the components in the fire protection system, the discharge control valve should be closed prior to closing the pressure relief valve to make sure that the fire protection system is not overpressurized. After the test, the valve must be opened again.	
NFPA 25 2017 8.3.3.8.1*		The pressure relief valve shall also be observed during each flow condition to determine whether the pressure relief valve closes at the proper pressure.	
NFPA 25 2017 A.8.3.3.8.1		A pressure relief valve that is open during a flow condition will affect test results.	
NFPA 25 2017 8.3.3.8.2		The pressure relief valve shall be closed during flow conditions if necessary to achieve minimum rated characteristics for the pump and reset to normal position at the conclusion of the pump test.	
NFPA 25 2017 8.3.3.8.2.1		When it is necessary to close the relief valve to achieve minimum rated characteristics for the pump, the pump discharge control valve shall be closed if the pump churn pressure exceeds the system rated pressure.	
NFPA 25 2017 8.3.3.8.3		When pressure relief valves are piped back to the fire pump suction, the temperature of the recirculating water shall be monitored to verify that it remains below temperatures that could result in equipment damage as defined by the pump and engine manufacturers.	
NFPA 25 2017 8.3.3.9		For installations having an automatic transfer switch, the following test shall be performed to ensure that the overcurrent protective devices (i.e., fuses or circuit breakers) do not open: (1) Simulate a power failure condition while the pump is operating at peak load. (2) Verify that the transfer switch transfers power to the alternate power source. (3) While the pump is operating at peak load and alternate power, record the following to include in the pump test results: (a) The voltage where an external means is provided on the controller (b) The amperage where an external means is provided on the controller (c) The rpm (d) Suction pressure (e) Discharge pressure (4) Verify that the pump continues to perform at peak horsepower load on the alternate power source for a minimum of 2 minutes. (5) Remove the power failure condition and verify that, after a time delay, the pump is reconnected to the normal power source.	
NFPA 25 2017 8.3.3.10*		Alarm conditions shall be simulated by activating alarm circuits at alarm sensor locations, and all such local or remote alarm indicating devices (visual and audible) shall be observed for operation.	
NFPA 25 2017 A.8.3.3.10		It is not the intent to verify that all the alarm conditions required by NFPA 20 (e.g., low oil pressure, high coolant temperature, failure of engine to start, engine overspeed) transmit individually to a remote location, as long as these alarms, where provided, can be individually verified at the fire pump controller.	
NFPA 25 2017 8.3.3.10.1*		Alarm sensors located within electric motor–driven fire pump controllers that cannot be accessed without opening an energized electric motor–driven fire pump controller shall be tested at an alternative location outside of the controller.	
NFPA 25 2017 A.8.3.3.10.1		Testing at an alternative location can include completion of a test at an external fire alarm monitor module used to monitor the sensors within the fire pump controller.	
NFPA 25 2017 8.3.3.12*	Annually	Suction Screens. After the waterflow portions of the annual test or fire protection system activations, the suction screens shall be inspected and cleared of any debris or obstructions.	PA 4037
NFPA 25 2017 A.8.3.3.12		During periods of unusual water supply conditions such as floods, inspection should be on a daily basis.	
NFPA 25 2017 8.3.3.13*	Annually	Where engines utilize electronic fuel management control systems, the backup electronic control module (ECM) and the primary and redundant sensors for the ECM shall be tested annually.	PA 4037

NFPA 25 2017 A.8.3.3.13		ECM and Sensor Testing. To verify the operation of the alternate ECM with the stop, the ECM selector switch should be moved to the alternate ECM position. Repositioning of this should cause an alarm on the fire pump controller. Then the engine is started; it should operate normally with all functions. Next, the engine is shut down, switched back to the primary ECM, and restarted briefly to verify that correct switchback has been accomplished. To verify the operation of the redundant sensor, with the engine running, the wires are disconnected from the primary sensor. There should be no change in the engine operation. The wires are then reconnected to the sensor, then disconnected from the redundant sensor. There should be no change in the engine operation. The wires should next be reconnected to the sensor. This process is repeated for all primary and redundant sensors on the engines. It should be noted whether disconnecting and reconnecting of wires to the sensors can be done while the engine is not running, then starting the engine after each disconnecting and reconnecting of the wires to verify engine operation.	

A7. Reports Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.4.1*		A complete written report of the fire pump test results shall be prepared for and retained by the owner.	PA 4038 PA 4039
NFPA 25 2017 A.8.4.1		For a sample pump test form see Figure A.8.4.1.	
NFPA 25 2017 8.4.1.1		As a minimum, the report shall contain the following information: (1) All raw data necessary for a complete evaluation of the fire pump performance, including suction and discharge pressures, voltage and amperage readings, and pump speed at each flow rate tested. (2) The fire protection system demand as furnished by the owner. (3) Pump performance, whether satisfactory or unsatisfactory. (4) Deficiencies noted during the testing and identified during analysis, with recommendations to address deficiencies as appropriate. (5) Manufacturer's performance data, actual performance, and the available pump discharge curves required by this standard. (6) Time delay intervals associated with the pump's starting, stopping, and energy source transfer. (7) Where applicable, comparison with previous test results.	

A8. Fire Pump System Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.5.1*	As per Approved Program	A preventive maintenance program shall be established on all components of the pump assembly in accordance with the manufacturer's recommendations or an approved alternative maintenance plan.	PA 4040
NFPA 25 2017 A.8.5.1		Where manufacturer's preventive maintenance requirements are not provided, refer to Table A.8.1.1.2. It is important to provide proper bearing lubrication and to keep bearings clean. Some bearings are the sealed type and need no relubrication. Couplings with rubber drive parts do not need lubrication; other types generally do. The following practices are recommended: (1) Lubricant fittings should be cleaned before relubricating with grease. (2) The proper amount of lubricant should be used. Too much lubricant results in churning, causing excessive power loss and overheating. (3) The correct lubricant should be used. **Engine Maintenance.** Engines should be kept clean, dry, and well lubricated. The proper oil level in the crankcase should be maintained. **Battery Maintenance.** Only distilled water should be used in battery cells. Plates should be kept submerged at all times. An automatic battery charger is not a substitute for proper maintenance	

		of the battery and charger. Periodic inspection ensures that the charger is operating correctly, the water level in the battery is adequate, and the battery is holding its proper charge. **Fuel Supply Maintenance.** The fuel storage tank should be kept at least two-thirds full. Fuel should be maintained free of water and foreign material by draining water and foreign material from the tank sump annually. This necessitates draining approximately 5 gal (19 L). **Temperature Maintenance.** The temperature of the pump room, pump house, or area where engines are installed should never be less than the minimum recommended by the engine manufacturer. The manufacturer's temperature recommendations for water and oil heaters should be followed.	
NFPA 25 2017 8.5.2		Records shall be maintained on all work performed on the pump, driver, controller, and auxiliary equipment.	
NFPA 25 2017 8.5.3		The preventive maintenance program shall be initiated immediately after the pump assembly has passed acceptance tests.	

Table A.8.1.1.2 Alternative Fire Pump Inspection, Testing, and Maintenance Procedures

Complete as Applicable	Visual Inspection	Inspect	Change	Clean	Test	Frequency
Pump System						
Pump bearings		X				Annually
Lubricate pump bearings			X			As needed
Inspect pump shaft end play		X				Annually
Inspect accuracy of pressure gauges and sensors		X	X			Annually (replace or recalibrate when 5% out of calibration)
Inspect pump coupling alignment		X				Annually
Wet pit suction screens		X		X		After each pump operation
Mechanical Transmission						
Lubricate coupling			X			Annually
Lubricate right-angle gear drive			X			Annually
Electrical System						
Exercise isolating switch and circuit breaker					X	Monthly
Trip circuit breaker (if mechanism provided)					X	Annually
Operate manual starting means (electrical)					X	Semiannually
Inspect and operate emergency manual starting means (without power)	X				X	Annually
Lubricate mechanical moving parts (excluding starters and relays)		X				Annually
Calibrate pressure switch settings*		X				Annually
Grease motor bearings		X				Annually
			X			Annually or as needed
Any corrosion on printed circuit boards (PCBs)*	X					Annually
Any cracked cable/wire insulation*	X					Annually
Any leaks in plumbing parts*	X					Annually
Any signs of water on electrical parts*	X					Annually
Diesel Engine System						
Fuel						
Tank level	X	X				Weekly
Tank float switch	X				X	Weekly
Solenoid valve operation	X				X	Weekly
Strainer, filter, or dirt leg, or combination thereof				X		Quarterly
Water and foreign material in tank				X		Annually
Water in system		X		X		Weekly
Flexible hoses and connectors	X					Weekly
Tank vents and overflow piping unobstructed		X			X	Annually
Piping	X					Annually
Lubrication system						
Oil level	X	X				Weekly
Oil change			X			50 hours or annually
Oil filter(s)			X			50 hours or annually
Lube oil heater		X				Weekly
Crankcase breather	X		X	X		Quarterly
Cooling system						
Level	X	X				Weekly
Antifreeze protection level					X	Semiannually
Antifreeze		X				Annually

(continues)

Table A.8.1.1.2 *Continued*

Complete as Applicable	Visual Inspection	Inspect	Change	Clean	Test	Frequency
Adequate cooling water to heat exchanger		X				Weekly
Rod out heat exchanger				X		Annually
Water pump(s)	X					Weekly
Condition of flexible hoses and connections	X	X				Weekly
Jacket water heater		X				Weekly
Inspect duct work, clean louvers (combustion air)	X	X	X			Annually
Water strainer				X		Quarterly
Exhaust system						
Leakage	X	X				Weekly
Drain condensate trap		X				Weekly
Insulation and fire hazards	X					Quarterly
Excessive back pressure					X	Annually
Exhaust system hangers and supports	X					Annually
Flexible exhaust section	X					Semiannually
Battery system						
Electrolyte level		X				Weekly
Terminals clean and tight	X	X				Quarterly
Case exterior clean and dry	X	X				Monthly
Specific gravity or state of charge					X	Monthly
Charger and charge rate	X					Monthly
Equalize charge		X				Monthly
Clean terminals				X		Annually
Cranking voltage exceeds 9 volts on a 12 volt system or 18 volts on a 24 volt system		X				Weekly
Electrical system						
General inspection	X					Weekly
Tighten control and power wiring connections		X				Annually
Wire chafing where subject to movement	X	X				Quarterly
Operation of safeties and alarms		X			X	Semiannually
Boxes, panels, and cabinets				X		Semiannually
Circuit breakers or fuses	X	X				Monthly
Circuit breakers or fuses			X			Biennially
Voltmeter and ammeter for accuracy (5%)		X				Annually
Any corrosion on printed circuit boards (PCBs)	X					Annually
Any cracked cable/wire insulation	X					Annually
Any leaks in plumbing parts	X					Annually
Any signs of water on electrical parts	X					Annually

*Required only where the extent of such work can be completed without the opening of an energized electric motor–driven fire pump controller.

B. Electric Driven Fire Pumps

In addition to A above, the following is required for electric driven fire pumps.

B1. No-Flow Test Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.3.1.2*		A no-flow test shall be conducted for electric motor–driven fire pumps on a test frequency in accordance with 8.3.1.2.1, 8.3.1.2.2, 8.3.1.2.3, or 8.3.1.2.4.	
NFPA 25 2017 A.8.3.1.2		For pressure relief valve operation, see 8.3.1.1.	
NFPA 25 2017 8.3.1.2.1	NJ NYS Weekly	Except as permitted in 8.3.1.2.2 and 8.3.1.2.3, a weekly test frequency shall be required for the following electric fire pumps: (1) Fire pumps that serve fire protection systems in buildings that are beyond the pumping capacity of the fire department (2) Fire pumps with limited service controllers (3) Vertical turbine fire pumps (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	PA 4035
NFPA 25 2017 8.3.1.2.2	NJ NYS Monthly	A monthly test frequency shall be permitted for electric fire pumps not identified in 8.3.1.2.1.	PA 4035
NFPA 25 2017 8.3.1.2.3*	NJ NYS Monthly	A monthly test frequency shall be permitted for electric fire pump systems having a redundant fire pump.	PA 4035
NFPA 25 2017 A.8.3.1.2.3	NJ NYS	For systems where multiple fire pumps are required to meet the system demand, a one-for-one redundancy is not necessary (i.e., one backup pump for two or more primary pumps meets the intent of this section).	
NFPA 25 2011 8.3.1.2*	NYC Monthly	Electric motor–driven fire pumps shall be operated monthly.	PA 4035
NFPA 25 2011 A.8.3.1.2	NYC	More frequent testing might need to be considered in areas susceptible to lightning.	
NFPA 25 2017 8.3.1.2.4*		The test frequency shall be permitted to be established by an approved risk analysis.	
NFPA 25 2017 A.8.3.1.2.4		The risk analysis should be prepared and reviewed by qualified people. Increased test frequencies can be desirable when high impact losses could result from an uncontrolled fire. Examples where increased fire pump test frequencies can be considered could include high piled storage facilities and buildings where the predominant occupancy is protected by an extra hazard density sprinkler system.	
NFPA 25 2017 8.3.2.3		The electric pump shall run a minimum of 10 minutes.	
NFPA 25 2017 8.3.3.9		For installations having an automatic transfer switch, the following test shall be performed to ensure that the overcurrent protective devices (i.e., fuses or circuit breakers) do not open: (1) Simulate a power failure condition while the pump is operating at peak load. (2) Verify that the transfer switch transfers power to the alternate power source. (3) While the pump is operating at peak load and alternate power, record the following to include in the pump test results: (a) The voltage where an external means is provided on the controller (b) The amperage where an external means is provided on the controller (c) The rpm (d) Suction pressure (e) Discharge pressure (4) Verify that the pump continues to perform at peak horsepower load on the alternate power source for a minimum of 2 minutes. (5) Remove the power failure condition and verify that, after a time delay, the pump is reconnected to the normal power source.	

C. Diesel Driven Fire Pumps

In addition to A above, the following is required for diesel driven fire pumps.

C1. No-Flow Testing Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.3.1.1*		A no-flow test shall be conducted for diesel engine–driven fire pumps on a test frequency in accordance with 8.3.1.1.1 or 8.3.1.1.2.	
NFPA 25 2017 A.8.3.1.1		Fire pump systems conforming to the 1999 and more recent editions of NFPA 20 should be designed so that the pressure relief valve has a minimum flow (to verify pressure relief valve is properly set and operating) at churn and only allows a larger flow under abnormal conditions (i.e., engine overspeed or failure of a variable speed pressure limiting control). In situations where the discharge from the relief valve is piped back to the pump suction, the fire pump imparts more energy into the water when recirculating the water through the pump than when the pump is operating at churn (no flow). Since the 1999 edition of NFPA 20 a circulation relief valve has been required downstream of the pressure relief valve whenever the pressure relief valve is piped back to the pump suction. Improperly installed and/or operating circulation relief valves can result in unacceptably high water temperature, especially when recirculating the water to the pump suction. High water temperatures can affect the operation of a diesel engine drive. Modern engines, due to EPA requirements, are more sensitive to cooling water temperatures. For fire pump systems conforming to editions of NFPA 20 prior to 1999 that were installed with a pressure relief valve piped back to suction without a circulation relief valve installed downstream of the pressure relief valve, installation of a circulation relief valve is needed. The test can be conducted without a circulation relief valve by taking suction and discharge pressure gauge readings quickly while there is no flow into the fire protection system, then creating a small flow by opening an inspector's test connection, alarm bypass or main drain downstream of the pump to prevent the pump from overheating during the rest of the test. However, if the first pump starts while it is unattended without water flowing into the fire protection system, it is likely to be damaged.	
NFPA 25 2017 8.3.1.1.1	Weekly	Except as permitted in 8.3.1.1.2, a weekly test frequency shall be required.	PA 4036
NFPA 25 2017 8.3.1.1.2*		The test frequency shall be permitted to be established by an approved risk analysis.	
NFPA 25 2017 A.8.3.1.1.2		The risk analysis should be prepared and reviewed by qualified people. Increased test frequencies might be desirable when high impact losses could result from an uncontrolled fire. Examples where increased fire pump test frequencies can be considered could include high piled storage facilities and buildings where the predominant occupancy is protected by an extra hazard density sprinkler system. Test frequency has been a heavily discussed and researched topic for several years, and is still continuing to be researched. A set of data was submitted in 2008 by a group of owners and maintainers of large numbers of fire pumps. This data was presented to the committee as indicating a decreased test frequency on electric fire pumps did not "significantly" impact "reliability"; however, "reliability" as used in the discussion of the data presentation was actually the failure rate, and did not take into account the effect of test frequency on the fire pump reliability (i.e., the time between failure and discovery of the failure affects reliability). Subsequently, the NFPA Research Council commissioned research, and the resultant "Fire Pump Field Data Collection and Analysis Report" in 2011 (available for download at www.nfpa.org/Foundation) reported that electric fire pumps tested weekly had a failure rate of approximately 0.64 per year. Assuming a failure rate independent of the test frequency, and assuming that on the average the impairment occurs at the midpoint of the test interval, this failure rate provides approximately 99.4 percent reliability with weekly testing and approximately 97.3 percent reliability with monthly testing. Diesel engine fire pumps tested weekly had a failure rate of approximately 1.02 per year. Assuming a failure rate independent of the test frequency and assuming that on the average the impairment occurs at the midpoint of the test interval, this failure rate provides approximately 99.1 percent reliability with weekly testing and approximately 96.0 percent reliability with monthly testing.	

		Based on this data, the lower reliability has not been determined to be acceptable for all facilities. Decisions to decrease test frequency must be based on more than cost savings. A reliability/risk analysis to decrease test frequency should take into account the risk associated with life safety, property values, hazards, and business interruption at the protected property. Fire pump redundancy can impact overall fire system reliability and be used in a reliability/risk analysis.	
NFPA 25 2017 8.3.2.4		The diesel pump shall run a minimum of 30 minutes.	

C2. Diesel Fuel Testing and Maintenance — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.3.4.1	Annually	Diesel fuel shall be tested for degradation no less than annually.	PA 4037
NFPA 25 2017 8.3.4.1.1*		Fuel degradation testing shall comply with ASTM D975, Standard Specification for Diesel Fuel Oils, or ASTM D6751, Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels, as approved by the engine manufacturer, using ASTM D7462, Standard Test Method for Oxidation Stability of Biodiesel (B100) and Blends of Biodiesel with Middle Distillate Petroleum Fuel (Accelerated Method).	
NFPA 25 2017 A.8.3.4.1.1		Commercial distillate fuel oils used in modern diesel engines are subject to various detrimental effects from storage. The origin of the crude oil, refinement processing techniques, time of year, and geographical consumption location all influence the determination of fuel blend formulas. Naturally occurring gums, waxes, soluble metallic soaps, water, dirt, blends, and temperature all contribute to the degradation of the fuel as it is handled and stored. These effects begin at the time of fuel refinement and continue until consumption. Proper maintenance of stored distillate fuel is critical for engine operation, efficiency, and longevity. Storage tanks should be kept water-free. Water contributes to steel tank corrosion and the development of microbiological growth where fuel and water interface. This and the metals of the system provide elements that react with fuel to form certain gels or organic acids, resulting in clogging of filters and system corrosion. Scheduled fuel maintenance helps to reduce fuel degradation. Fuel maintenance filtration can remove contaminants and water and maintain fuel conditions to provide reliability and efficiency for standby fire pump engines. Fuel maintenance and testing should begin the day of installation and first fill.	
NFPA 25 2017 8.3.4.2*		If diesel fuel is found to be deficient in the testing required in 8.3.4.1.1, the fuel shall be reconditioned or replaced, the supply tank shall be cleaned internally, and the engine fuel filter(s) shall be changed.	
NFPA 25 2017 A.8.3.4.2		Where environmental or fuel quality conditions result in degradation of the fuel while stored in the supply tank, from items such as water, micro-organisms and particulates, or destabilization, active fuel maintenance systems permanently installed on the fuel storage tanks have proven to be successful at maintaining fuel quality. An active fuel maintenance system will maintain the fuel quality in the tank, therefore preventing the fuel from going through possible cycles of degradation, risking engine reliability, and then requiring reconditioning.	
NFPA 25 2017 8.3.4.2.1		After the restoration of the fuel and tank in 8.3.4.2, the fuel shall be retested every 6 months until experience indicates the fuel can be stored for a minimum of 1 year without degradation beyond that allowed in 8.3.4.1.1.	
NFPA 25 2017 8.3.4.3		When provided, active fuel maintenance systems shall be listed for fire pump service.	
NFPA 25 2017 8.3.4.3.1		Maintenance of active fuel maintenance systems shall be in accordance with the manufacturer's recommendations.	
NFPA 25 2017 8.3.4.3.2		Maintenance of active fuel maintenance systems shall be performed at a minimum annual frequency for any portion of the system that the manufacturer does not provide a recommended maintenance frequency.	
NFPA 25 2017 8.3.4.3.3		Where utilized, fuel additives shall be used and maintained in accordance with the active fuel maintenance system manufacturer's recommendations.	

D. Fire Pump Pressure Relief Valves

D1. Circulation Relief Valves — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.6.1.1	NJ NYS As Identified	Where installed, circulation relief valves shall be inspected on the same frequency as the no-flow (churn) test.	PA 4037
NFPA 25 2011 13.5.7.1	NYC Weekly	All circulation relief valves shall be inspected weekly.	PA 4037
NFPA 25 2017 13.5.6.1.2		The inspection shall verify that water flows through the valve when the fire pump is operating at shutoff pressure (i.e., churn) to prevent the pump from overheating.	
NFPA 25 2017 13.5.6.1.3		On completion of any fire pump test, the closure of the circulation relief valve shall be verified.	

D2. Main Pressure Relief Valves — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.6.2.1	During any Fire Pump Test	Where installed, main pressure relief valves shall be inspected during any fire pump test.	PA 4037
NFPA 25 2011 13.5.7.2	NYC Weekly	All pressure relief valves shall be inspected weekly.	PA 4037
NFPA 25 2017 13.5.6.2.2		The inspection shall verify that the pressure downstream of the relief valve fittings in the fire pump discharge piping does not exceed the pressure for which the system components are rated.	

D3. Fire Pump Pressure Relief Valves — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.7	As Required	Maintenance. All damaged or missing components noted during the inspections specified in 13.6.1 through 13.6.2.2 shall be repaired or replaced in accordance with the manufacturer's instructions.	PA 4037

E. Component Replacement Testing Requirements

E1. Component Replacement Testing Requirements — Adjusted, Repaired Rebuilt, Replaced

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 8.6.1		Whenever a component in a fire pump is adjusted, repaired, rebuilt, or replaced, the tests required to restore the system to service shall be performed in accordance with Table 8.6.1.	
NFPA 25 2017 8.6.2		NFPA 20 shall be consulted for the minimum requirements for design, installation, and acceptance testing.	
NFPA 25 2017 8.6.3		Replacement parts shall be provided that will maintain the listing for the fire pump component assembly whenever possible.	
NFPA 25 2017 8.6.3.1		If the part is no longer available from the original equipment manufacturer, then an approved like part shall be permitted to be used.	

Table 8.6.1 Summary of Component Action Requirements

Component	Adjust	Repair	Rebuild	Replace	Test Criteria
Fire Pump System					
Entire pump assembly				X	Perform acceptance test in accordance with NFPA 20
Impeller/rotating assembly		X		X	Perform acceptance test in accordance with NFPA 20
Casing		X		X	Perform acceptance test in accordance with NFPA 20 with alignment inspection
Bearings				X	Perform annual test in accordance with 8.3.3
Sleeves				X	Perform annual test in accordance with 8.3.3
Wear rings				X	Perform annual test in accordance with 8.3.3
Main shaft		X		X	Perform annual test in accordance with 8.3.3
Packing	X			X	Perform test in accordance with 8.3.2
Mechanical Transmission					
Gear right angle drives		X	X	X	Perform acceptance test in accordance with NFPA 20
Drive coupling	X	X	X	X	Perform test in accordance with 8.3.3 with alignment inspection
Electrical System/Controller					
Entire controller				X	Perform acceptance test in accordance with NFPA 20
Electronic component or module that can prevent the controller from starting or running			X	X	Perform acceptance test in accordance with NFPA 20
Electronic component or module that will not prevent the controller from starting or running			X	X	Perform weekly test in accordance with NFPA 25
Plumbing part				X	Perform weekly test in accordance with NFPA 25
Isolating switch				X	Perform test in accordance with 8.3.2 and exercise six times
Circuit breaker	X				Perform six momentary starts in accordance with NFPA 20
Circuit breaker				X	Test in accordance with 8.3.3, including six starts at peak load and operate pump for a minimum of one hour
Electrical connections	X				Perform test in accordance with 8.3.2
Main contactor		X		X	Perform test in accordance with 8.3.3 with six starts
Power monitor				X	Perform six operations of the circuit breaker/isolation switch disconnect (cycle the power on/off)
Start relay				X	Perform test in accordance with 8.3.2 with six starts
Pressure switch	X			X	Perform test in accordance with 8.3.2 and exercise six times automatically
Pressure transducer	X			X	Perform six automatic no-load starts
Manual start or stop switch				X	Perform six operations under load
Transfer switch — load carrying parts		X	X	X	Test in accordance with 8.3.3, including six starts at peak horsepower load, operate pump for a minimum of one hour, and transfer from normal power to emergency power and back one time
Transfer switch — no-load parts		X	X	X	Perform six no-load operations of transfer of power
Electric Motor Driver					
Electric motor		X	X	X	Perform acceptance test in accordance with 8.3.3, including alignment tests
Motor bearings				X	Perform annual test in accordance with 8.3.3
Incoming power conductors				X	Test in accordance with 8.3.3 and operate pump for a minimum of one hour, including six starts at peak load
Diesel Engine Driver					
Entire engine			X	X	Perform acceptance test in accordance with NFPA 20
Fuel transfer pump	X		X	X	Perform test in accordance with 8.3.2

(continues)

Table 8.6.1 *Continued*

Component	Adjust	Repair	Rebuild	Replace	Test Criteria
Fuel injector pump or ECM	X			X	Perform test in accordance with 8.3.3
Fuel system filter		X		X	Perform test in accordance with 8.3.2
Combustion air intake system		X		X	Perform test in accordance with 8.3.2
Fuel tank		X		X	Perform test in accordance with 8.3.2
Cooling system		X	X	X	Perform test in accordance with 8.3.3
Batteries		X		X	Perform start/stop sequence in accordance with NFPA 25
Battery charger		X		X	Perform test in accordance with 8.3.2
Electric system		X		X	Perform test in accordance with 8.3.2
Lubrication filter/oil service		X		X	Perform test in accordance with 8.3.2
Steam Turbines					
Steam turbine		X		X	Perform acceptance test in accordance with NFPA 20
Steam regulator or source upgrade		X		X	Perform acceptance test in accordance with NFPA 20
Positive Displacement Pumps					
Entire pump				X	Perform acceptance test in accordance with NFPA 20
Rotors				X	Perform annual test in accordance with 8.3.3
Plungers				X	Perform annual test in accordance with 8.3.3
Shaft				X	Perform annual test in accordance with 8.3.3
Driver		X	X	X	Perform acceptance test in accordance with NFPA 20
Bearings				X	Perform annual test in accordance with 8.3.3
Seals				X	Perform test in accordance with 8.3.2
Pump House and Miscellaneous Components					
Baseplate		X			Perform test in accordance with 8.3.2 with alignment inspection
Baseplate				X	Perform test in accordance with 8.3.3 with alignment inspection
Foundation		X	X	X	Perform test in accordance with 8.3.2 with alignment inspection
Suction/discharge pipe		X		X	Perform visual inspection in accordance with 8.2.2
Suction/discharge fittings		X		X	Perform visual inspection in accordance with 8.2.2
Suction/discharge valves		X	X	X	Perform operational test in accordance with 13.3.3.1

FIRE PUMP SYSTEMS
GENERAL INFORMATION

PA 4032 / 12-20

Building ID:

Fire Pump Identification

Pump Location:

Original Installation Date:

Pump provides supplies to:

Fire Pump Information

Rating GPM:_____ Head (psi): _____ Speed (rpm): _____

Manufacturer: _____

Serial Number:

Impeller Diameter (in):

Fire Pump Driver

Manufacturer: _____

Serial Number: _____ Speed (rpm):_____ Horse Power: _____

Electric

Volts: _____ Amps at Full Load: _____ Phase: _____Cycle _____

Diesel

Number of Cylinders:

Diesel Fuel Storage Tank Capacity (gal):

Fire Pump Controller

Manufacturer:_____

Serial Number:_____

Cut in Pressure (psi):_____

Cut out Pressure (psi):_____

Auto/Manual Start:

Auto/Manual Stop:

Emergency Power

Source: _____

Serial Number: _____

Transfer Switch Manufacturer:

Jockey Pump

Manufacturer: _____

Serial Number: _____

Cut in Pressure (psi):

Cut out Pressure (psi):

Water Supply Source

City Supply (Name of Utility)

Storage Tank (No. & Size)

Circulating Relief Valve Yes No

Main Relief Valve Yes No

Manufacturer: Size: Pressure Setting for Relief:

Notes:

FIRE PUMP SYSTEMS
WEEKLY INSPECTIONS

PA 4033 / 12-20

Building ID:

- Use this form to document inspections of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fire Pump System – Inspection – Weekly – {Reference C4A3} –** The pertinent visual observations specified in the following checklists shall be performed weekly. Pump house conditions are determined as follows:
   (a) Heat is adequate, not less than 40°F (4.0°C) for pump room with electric motor or diesel engine–driven pumps with engine heaters.
   (b) Heat is adequate, not less than 70°F (21°C) for pump room with diesel engine–driven pumps without engine heaters.
   (c) Ventilating louvers are free to operate.
   (d) Excessive water does not collect on the floor.
   (e) Coupling guard is in place.

2. **Fire Pump System – Inspection – Weekly – {Reference C4A3} –** The pertinent visual observations specified in the following checklists shall be performed weekly. Pump system conditions are determined as follows:
   (a) Pump suction and discharge and bypass valves are fully open.
   (b) Piping is free of leaks.
   (c) Suction line pressure gauge reading is within acceptable range.
   (d) System line pressure gauge reading is within acceptable range.
   (e) Suction reservoir has the required water level.
   (f) Wet pit suction screens are unobstructed and in place.
   (g) Waterflow test valves are in the closed position, the hose connection valve is closed, and the line to test valves is free of water.

3. **Fire Pump System – Inspection – Weekly – {Reference C4A3} –** The pertinent visual observations specified in the following checklists shall be performed weekly. Electrical system conditions are determined as follows:
   (a) Controller pilot light (power on) is illuminated.
   (b) Transfer switch normal pilot light is illuminated.
   (c) Isolating switch is closed — standby (emergency) source.
   (d) Reverse phase alarm pilot light is off, or normal phase rotation pilot light is on.
   (e) Oil level in vertical motor sight glass is within acceptable range.
   (f) Power to pressure maintenance (jockey) pump is provided.

4. **Fire Pump System – Inspection – Weekly – {Reference C4A3} –** The pertinent visual observations specified in the following checklists shall be performed weekly. Diesel engine system conditions are determined as follows:
   (a) Fuel tank is at least two-thirds full.
   (b) Controller selector switch is in auto position.
   (c) Batteries' (2) voltage readings are within acceptable range.
   (d) Batteries' (2) charging current readings are within acceptable range.
   (e) Batteries' (2) pilot lights are on or battery failure (2) pilot lights are off.
   (f) All alarm pilot lights are off.
   (g) Engine running time meter is reading.
   (h) Oil level in right angle gear drive is within acceptable range.
   (i) Crankcase oil level is within acceptable range.
   (j) Cooling water level is within acceptable range.
   (k) Electrolyte level in batteries is within acceptable range.
   (l) Battery terminals are free from corrosion.
   (m) Water-jacket heater is operating.

S = Satisfactory **U = Unsatisfactory**

Pump ID	Date	Inspector	Task/Result	Notes

FIRE PUMP SYSTEMS
PERIODIC INSPECTIONS / MAINTENANCE

Building ID:

- Use this form to document inspection and maintenance of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fuel Tanks, Float Switches, Supervisory Signals – Inspection/Maintenance – Quarterly – {Reference C4A4} –** Fuel tanks, float switches, and supervisory signals for interstitial space shall be checked quarterly for liquid intrusion.
2. **Pump Shaft – Inspection/Maintenance – Annually – {Reference C4A4} –** Shaft movement or end play shall be checked (inspected) annually with the pump operating.
3. **Electrical Connections – Inspection/Maintenance – Annually – {Reference C4A4} –** Electrical connections shall be checked annually and repaired as necessary to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.
4. **Pump and Motor Bearings and Couplings – Inspection/Maintenance – Annually – {Reference C4A4} –** Pump and motor bearings and couplings shall be greased annually or as required.
5. **Printed Circuit Boards (PCBs) – Inspection/Maintenance – Annually – {Reference C4A4} –** Printed circuit boards (PCBs) shall be checked annually for corrosion to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.
6. **Cable/Wire Insulation – Inspection/Maintenance – Annually – {Reference C4A4} –** Cable and/or wire insulation shall be checked annually for cracking to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.
7. **Plumbing Parts – Inspection/Maintenance – Annually – {Reference C4A4} –** Plumbing parts, both inside and outside of electrical panels, shall be checked annually for any leaks to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.
8. **Supervisory Signal Circuitry – Inspection/Maintenance – Annually – {Reference C4A4} –** Supervisory signal circuitry shall be checked annually for high cooling water temperature.

S = Satisfactory **U = Unsatisfactory**

Pump ID	Date	Inspector	Task/Result	Notes

FIRE PUMP SYSTEMS **PA 4034 / 12-20**
PERIODIC INSPECTIONS / MAINTENANCE

Building ID:

- Use this form to document inspection and maintenance of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

9. **Fuel Tanks – Inspection/Maintenance – Annually – {Reference C4A4} –** Fuel tanks shall be checked annually for water and foreign materials.

10. **Fuel Tank Vents, Overflow Piping – Inspection/Maintenance – Annually – {Reference C4A4} –** Fuel tank vents and overflow piping shall be checked annually for any obstructions.

11. **Flexible Hoses, Connections – Inspection/Maintenance – Annually – {Reference C4A4} –** All flexible hoses and connections shall be checked annually for cracks and leaks.

12. **Engine Crankcase Breathers – Inspection/Maintenance – Annually – {Reference C4A4} –** Engine crankcase breathers shall be checked annually.

13. **Exhaust Systems, Drain Condensate Traps, Silencers – Inspection/Maintenance – Annually – {Reference C4A4} –** Exhaust systems, drain condensate traps, and silencers shall be checked annually.

14. **Engine Turbos – Inspection/Maintenance – Annually – {Reference C4A4} –** Back pressure on the engine turbos shall be measured annually. Recorded measurement in Notes.

15. **Engine Batteries – Inspection/Maintenance – Annually – {Reference C4A4} –** Batteries shall be checked annually as follows:
    (1) Checking the specific gravity, state of charge, and charger rates of the batteries
    (2) Cleaning the terminals of any corrosion.
    (3) Ensuring that the cranking voltage exceeds 9 V on a 12 V system or 18 V on a 24 V system
    (4) Ensuring that only distilled water is used in batteries

S = Satisfactory **U = Unsatisfactory**

Pump ID	Date	Inspector	Task/Result	Notes

FIRE PUMP SYSTEMS
PERIODIC INSPECTIONS / MAINTENANCE

Building ID:

- Use this form to document inspection, testing, maintenance of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

16. **Controls, Power Wiring – Inspection/Maintenance – Annually – {Reference C4A4} –** All controls and power wiring connections shall be checked annually and repaired as necessary to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.

17. **Engine Lubricating Oil – Inspection/Maintenance – Annually – {Reference C4A4}** – Lubricating oil in engines shall be changed every 50 hours of operation or annually.

18. **Lubricating Oil Filters – Inspection/Maintenance – Annually – {Reference C4A4} –** Lubricating oil filters shall be changed every 50 hours of operation or annually.

19. **Anodes – Inspection/Maintenance – Annually – {Reference C4A4} –** The condition of sacrificial anodes shall be checked annually and replaced as necessary.

20. **Circulating Water Filters – Inspection/Maintenance – Annually – {Reference C4A4}** – Circulating water filters shall be replaced annually.

21. **Pressure Gauges, Sensors – Inspection/Maintenance – Annually – {Reference C4A4} –** The accuracy of pressure gauges and sensors shall be inspected annually and replaced or recalibrated when more than 5 percent out of calibration to the extent that such work can be completed without opening an energized electric motor–driven fire pump controller.

22. **Pump/Driver Alignment – Inspection/Maintenance – Annually – {Reference C4A4} –** Parallel and angular alignment of the pump and driver shall be inspected during the annual test, and any misalignment shall be corrected.

S = Satisfactory **U = Unsatisfactory**

Pump ID	Date	Inspector	Task/Result	Notes

FIRE PUMP SYSTEMS
NO-FLOW FIRE PUMP TESTING – ELECTRIC FIRE PUMPS

PA 4035 / 12-20

Building ID: **Pump ID**

- Use this form to document inspection and testing of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **No-Flow Fire Pump Testing – Testing – Weekly – {Reference C4B1} –** Except as permitted in 8.3.1.2.2 and 8.3.1.2.3, a weekly test frequency shall be required for the following electric fire pumps:
   (1) Fire pumps that serve fire protection systems in buildings that are beyond the pumping capacity of the fire department
   (2) Fire pumps with limited service controllers
   (3) Vertical turbine fire pumps
   (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

2. **No-Flow Fire Pump Testing – Testing – Monthly – {Reference C4B1}** – A monthly test frequency shall be permitted for electric fire pumps not identified in 8.3.1.2.1.

3. **No-Flow Fire Pump Testing – Visual Observations – {Reference C4A5} -** The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is idle:
   (1) Record the system suction and discharge pressure gauge readings.
   (2) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log where such information is available without having to open an energized electric motor–driven fire pump controller.
   (3) If the highest or lowest pressure is outside of the expected range, record all information from the event log that helps identify the abnormality.

4. **No-Flow Fire Pump Testing – Visual Observations – {Reference C4A5} –** The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running. The test shall be conducted by starting the pump automatically. The electric pump shall run a minimum of 10 minutes.
   (1) Pump system procedure is as follows:
      (a) Record the pump starting pressure from the pressure switch or pressure transducer.
      (b) Record the system suction and discharge pressure gauge readings.
      (c) Inspect the pump packing glands for slight discharge.
      (d) Adjust gland nuts if necessary.
      (e) Inspect for unusual noise or vibration.
      (f) Inspect packing boxes, bearings, or pump casing for overheating.
      (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge.
      (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log.
      (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water.
   (2) Electrical system procedure is as follows:
      (a) Observe the time for motor to accelerate to full speed.
      (b) Record the time controller is on first step (for reduced voltage or reduced current starting).
      (c) Record the time pump runs after starting (for automatic stop controllers).

S = Satisfactory **U = Unsatisfactory**

Date of Inspection						
Inspector's Name						
Pump Starting Pressure						
Pump Suction Pressure (Idle / Running)						
Pump Discharge Pressure (Idle / Running)						
Pump Run Time						
Results						

Notes

FIRE PUMP SYSTEMS
NO-FLOW FIRE PUMP TESTING – DIESEL FIRE PUMPS

PA 4036 / 12-20

Building ID: **Pump ID**

- Use this form to document inspection and testing of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **No-Flow Fire Pump Testing – Testing – Weekly – {Reference C4C1} –** Except as permitted in 8.3.1.1.2, a weekly test frequency shall be required.

2. **No-Flow Fire Pump Testing – Visual Observations – {Reference C4A5}** – The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is idle:
   (1) Record the system suction and discharge pressure gauge readings.
   (2) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log where such information is available without having to open an energized electric motor–driven fire pump controller.
   (3) If the highest or lowest pressure is outside of the expected range, record all information from the event log that helps identify the abnormality.

3. **No-Flow Fire Pump Testing – Visual Observations – {Reference C4A5} –** The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running. The test shall be conducted by starting the pump automatically. The diesel pump shall run a minimum of 30 minutes.
   (1) Pump system procedure is as follows:
      (a) Record the pump starting pressure from the pressure switch or pressure transducer.
      (b) Record the system suction and discharge pressure gauge readings.
      (c) Inspect the pump packing glands for slight discharge.
      (d) Adjust gland nuts if necessary.
      (e) Inspect for unusual noise or vibration.
      (f) Inspect packing boxes, bearings, or pump casing for overheating.
      (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge.
      (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log.
      (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water.
   (2) Diesel engine system procedure is as follows:
      (a) Observe the time for engine to crank.
      (b) Observe the time for engine to reach running speed.
      (c) Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running.
      (d) Record any abnormalities.
      (e) Inspect the heat exchanger for cooling waterflow.

S = Satisfactory **U = Unsatisfactory**

Date of Inspection						
Inspector's Name						
Pump Starting Pressure						
Pump Suction Pressure (Idle / Running)						
Pump Discharge Pressure (Idle / Running)						
Pump Run Time						
Results						

Notes

FIRE PUMP SYSTEMS
PRESSURE RELIEF VALVES / DIESEL FUEL – INSPECTION/TESTING

PA 4037 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Circulation Relief Valves – Inspection/Testing – As Per No-Flow Test Schedule – {Reference C4D1} -** Where installed, circulation relief valves shall be inspected on the same frequency as the no-flow (churn) test. The inspection shall verify that water flows through the valve when the fire pump is operating at shutoff pressure (i.e., churn) to prevent the pump from overheating. On completion of any fire pump test, the closure of the circulation relief valve shall be verified.

2. **Main Pressure Relief Valves – Inspection/Testing – As Per No-Flow Test Schedule – {Reference C4D2}** – Where installed, main pressure relief valves shall be inspected during any fire pump test. The inspection shall verify that the pressure downstream of the relief valve fittings in the fire pump discharge piping does not exceed the pressure for which the system components are rated.

3. **Fire Pump Pressure Relief Valves – Maintenance – As Required – {Reference C4D3} -** All damaged or missing components noted during the inspections specified in 13.6.1 through 13.6.2.2 shall be repaired or replaced in accordance with the manufacturer's instructions.

4. **Diesel Fuel Testing and Maintenance – Testing – Annually – {Reference C4C2} –** Diesel fuel shall be tested for degradation no less than annually.

5. **Suction Screens – Inspection/Maintenance – Annually – {Reference C4A6} -** Suction Screens. After the waterflow portions of the annual test or fire protection system activations, the suction screens shall be inspected and cleared of any debris or obstructions.

6. **Electronic Fuel Management Control Systems – Tested – Annually – {Reference C4A6}** – Where engines utilize electronic fuel management control systems, the backup electronic control module (ECM) and the primary and redundant sensors for the ECM shall be tested annually.

S = Satisfactory **U = Unsatisfactory**

Pump ID	Date	Inspector	Task/Result	Notes

THE PORT AUTHORITY OF NY & NJ

FIRE PUMP SYSTEMS
ANNUAL PERFORMANCE TESTS

PA 4038 / 12-20

Building ID: **Pump ID:**

Date: **Inspector:**

- Use this form to document the annual testing of fire pump systems.
- Record the measured value or "S" to indicate a satisfactory or "U" if unsatisfactory.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fire Pump Systems – Testing – Annually – {Reference C4A6}** – An annual test of each pump assembly shall be conducted by qualified personnel under no-flow (churn), rated flow, and 150 percent of the pump rated capacity flow of the fire pump by controlling the quantity of water discharged through approved test devices.

- The pertinent visual observations, measurements, and adjustments specified in the following checklists shall be conducted annually while the pump is running and flowing water under the specified output condition:
  - (1) At no-flow condition (churn), the procedure is as follows:
    - (a) Inspect the circulation relief valve for operation to discharge water.
    - (b) Inspect the pressure relief valve (if installed) for proper operation.
  - (2) At each flow condition, the procedure is as follows:
    - (a) Where an external means is provided on the controller, record the electric motor voltage and current (all lines).
    - (b) Record the pump speed in rpm.
    - (c) Record the simultaneous (approximately) readings of pump suction and discharge pressures and pump discharge flow.
  - (3) For electric motor–driven pumps, do not shut down the pump until it has run for 10 minutes.
  - (4) For diesel motor–driven pumps, do not shut down the pump until it has run for 30 minutes.

- For installations having an automatic transfer switch, the following test shall be performed to ensure that the overcurrent protective devices (i.e., fuses or circuit breakers) do not open:
  - (1) Simulate a power failure condition while the pump is operating at peak load.
  - (2) Verify that the transfer switch transfers power to the alternate power source.
  - (3) While the pump is operating at peak load and alternate power, record the following to include in the pump test results:
    - (a) The voltage where an external means is provided on the controller
    - (b) The amperage where an external means is provided on the controller
    - (c) The rpm
    - (d) Suction pressure
    - (e) Discharge pressure
  - (4) Verify that the pump continues to perform at peak horsepower load on the alternate power source for a minimum of 2 minutes.
  - (5) Remove the power failure condition and verify that, after a time delay, the pump is reconnected to the normal power source.

Inspect and Operate Emergency Manual Start		Electric Motor - Check operation of circulation relief valve	
Automatic start functions properly.		Check operation of Main Pressure Relief Valve	
Automatic stop functions properly.		Timer reset and graph paper changed?	
Automatic start:	psi	Timer indicates total run time:	min
Manual start functions properly.		Electric Motor Pumps - Simulate power failure while pump is operating at peak load.	
Manual stop functions properly.		Electric Motor Pumps - Verify that Transfer Switch transfers power to alternate power source.	
Remote start functions properly.		Electric Motor Pumps - Verify performance of pump at peak load on emergency power source.	
Jockey pump operational.		Electric Motor Pumps - Remove power failure condition and verify pump reconnects to normal power source.	
Jockey pump "turn-on" pressure:	psi	Jockey pump appears properly aligned.	
Jockey pump "turn-off" pressure:	psi	Jockey pump valves open.	

Complete test data and flow charts. (Attach all water-flow charts, electrical power charts, performance curves, etc.)

Notes:

FIRE PUMP SYSTEMS **PA 4039 / 12-20**
ANNUAL TEST SUMMARY PAGE

Building ID: **Pump ID:**

Date: **Inspector:**

1. **Reports – {Reference C4A7} -** The report shall contain the following information:
   (1) All raw data necessary for a complete evaluation of the fire pump performance, including suction and discharge pressures, voltage and amperage readings, and pump speed at each flow rate tested.
   (2) The fire protection system demand as furnished by the owner.
   (3) Pump performance, whether satisfactory or unsatisfactory.
   (4) Deficiencies noted during the testing and identified during analysis, with recommendations to address deficiencies as appropriate.
   (5) Manufacturer's performance data, actual performance, and the available pump discharge curves required by this standard.
   (6) Time delay intervals associated with the pump's starting, stopping, and energy source transfer.
   (7) Where applicable, comparison with previous test results.

	Test 1	Test 2	Test 3
Approximate percent of rated pump discharge (gpm)/(L/min)	0	100%	150%
Nozzle size in inches (mm)	No flow		
Pitot pressure in psi (bar)	None		
Flow in gpm (L/min)	None		
Pump suction in psi (bar)			
Pump discharge in psi (bar)			
Net pump head (discharge pressure minus suction pressure)			
Pump speed (rpm)			
Electric Motor - Record electrical voltage			
Electric Motor - Record current (all lines)			
Electric Motor - Operate electric circuit breaker.			
Diesel Engine - Check for excessive back pressure in exhaust system.			

Notes:

FIRE PUMP SYSTEMS
MAINTENANCE

PA 4040 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fire Pump System – Maintenance – As Per Approved Program – {Reference C4A8} –** A preventive maintenance program shall be established on all components of the pump assembly in accordance with the manufacturer's recommendations or an approved alternative maintenance plan.

- **Where manufacturer's preventive maintenance requirements are not provided, refer to Table A.8.1.1.2. {Reference C4A8}**
  It is important to provide proper bearing lubrication and to keep bearings clean. Some bearings are the sealed type and need no relubrication. Couplings with rubber drive parts do not need lubrication; other types generally do. The following practices are recommended:
  (1) Lubricant fittings should be cleaned before relubricating with grease.
  (2) The proper amount of lubricant should be used. Too much lubricant results in churning, causing excessive power loss and overheating.
  (3) The correct lubricant should be used.

  Engine Maintenance. Engines should be kept clean, dry, and well lubricated. The proper oil level in the crankcase should be maintained.

  Battery Maintenance. Only distilled water should be used in battery cells. Plates should be kept submerged at all times. An automatic battery charger is not a substitute for proper maintenance of the battery and charger. Periodic inspection ensures that the charger is operating correctly, the water level in the battery is adequate, and the battery is holding its proper charge.

  Fuel Supply Maintenance. The fuel storage tank should be kept at least two-thirds full. Fuel should be maintained free of water and foreign material by draining water and foreign material from the tank sump annually. This necessitates draining approximately 5 gal (19 L).

  Temperature Maintenance. The temperature of the pump room, pump house, or area where engines are installed should never be less than the minimum recommended by the engine manufacturer. The manufacturer's temperature recommendations for water and oil heaters should be followed.

- **Records shall be maintained on all work performed on the pump, driver, controller, and auxiliary equipment.** Provide details of maintenance in Notes.

S = Satisfactory **U = Unsatisfactory**

Pump ID	Date	Inspector	Task/Result	Notes

CHAPTER 5 – WATER STORAGE TANKS

A All Water Storage Tanks

A1. Existing Water Storage Tanks General Information — Update — Form PA 4045

Frequency – Annually

Review General Information Form for all Water Storage Tanks, update as required.

A2. New or Altered Water Storage Tanks General Information — Update — Form PA 4045

Frequency – As Required

Complete General Information Form for new Water Storage Tanks or update General Information Form for Water Storage Tanks that have been altered to include repairs and/or modifications to components.

A3. Water Level — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.4.2		The tank shall be maintained full or at the designed water level.	
NFPA 25 2017 9.2.1.2	Monthly	The water level in tanks not equipped with supervised water level alarms connected to a constantly attended location shall be inspected monthly.	PA 4047
NFPA 25 2017 9.2.1.1*	Quarterly	The water level in tanks equipped with supervised water level alarms that are supervised in accordance with NFPA 72 shall be inspected quarterly.	PA 4047
NFPA 25 2017 A.9.2.1.1		More frequent inspections should be made where extreme conditions, such as freezing temperatures or arid climate, can increase the probability of adversely affecting the stored water. Supervisory water level alarms installed on tanks provide notification that the tank water level is above or below an acceptable level. The water level of the tank is the main concern as opposed to the condition of the water. For convenience, inspection of the condition of the water can take place concurrently with the water level inspection.	

A4. Water Level — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.3.1*	5 Years	Level indicators shall be tested every 5 years for accuracy and freedom of movement.	PA 4047
NFPA 25 2017 A.9.3.1		The testing procedure for listed mercury gauges is as follows. To determine that the mercury gauge is accurate, the gauge should be tested every 5 years as follows [steps (1) through (7) coincide with Figure A.9.3.1]: (1) Overflow the tank. (2) Close valve F. Open test cock D. The mercury will drop quickly into the mercury pot. If it does not drop, there is an obstruction that needs to be removed from the pipe or pot between the test cock and the gauge glass. (3) If the mercury does lower at once, close cock D and open valve F. If the mercury responds immediately and comes to rest promptly opposite the “FULL” mark on the gauge board, the instrument is functioning properly.	

		(4) If the mercury column does not respond promptly and indicate the correct reading during the test, there probably are air pockets or obstructions in the water connecting pipe. Open cock D. Water should flow out forcibly. Allow water to flow through cock D until all air is expelled and rusty water from the tank riser appears. Close cock D. The gauge now likely will read correctly. If air separates from the water in the 1 in. (25 mm) pipe due to being enclosed in a buried tile conduit with steam pipes, the air can be removed automatically by installing a 3⁄4 in. (20 mm) air trap at the high point of the piping. The air trap usually can be installed most easily in a tee connected by a short piece of pipe at E, with a plug in the top of the tee so that mercury can be added in the future, if necessary, without removing the trap. If there are inaccessible pockets in the piping, as where located below grade or under concrete floors, the air can be removed only through petcock D. (5) If, in step (4), the water does not flow forcibly through cock D, there is an obstruction that needs to be removed from the outlet of the test cock or from the water pipe between the test cock and the tank riser. (6) If there is water on top of the mercury column in the gauge glass, it will provide inaccurate readings and should be removed. First, lower the mercury into the pot as in step (2). Close cock D and remove plug G. Open valve F very slowly, causing the mercury to rise slowly and the water above it to drain through plug G. Close valve F quickly when mercury appears at plug G, but have a receptacle ready to catch any mercury that drains out. Replace plug G. Replace any escaped mercury in the pot. (7) After testing, leave valve F open, except under the following conditions: If it is necessary to prevent forcing mercury and water into the mercury catcher, the controlling valve F can be permitted to be closed when filling the tank but should be left open after the tank is filled. In cases where the gauge is subjected to continual fluctuation of pressure, it could be necessary to keep the gauge shut off except when it needs to be read. Otherwise, it could be necessary to remove water frequently from the top of the mercury column as in step (5).	

A5. Water Level Alarms — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.3.5*	NYS Annually	High and low water level signals shall be tested annually.	PA 4047
NFPA 25 2011 9.3.5*	NJ NYC SemiAnnually	High and low water level alarms shall be tested semiannually.	PA 4047
NFPA 25 2017 A.9.3.5		See A.9.3.4. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 A.9.3.4		The manufacturer's instructions should be consulted for guidance on testing. In some situations, it might not be possible to test the actual initiating device. In such cases, only the circuitry should be tested. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	

A6. Water Temperature — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.2.3.1		The temperature of water in tanks shall not be less than 40°F (4.0°C).	
NFPA 25 2017 9.2.3.3	Weekly	The temperature of water in tanks without low temperature alarms connected to a constantly attended location shall be inspected and recorded weekly during the heating season when the mean temperature is less than 40°F (4.0°C).	PA 4046
NFPA 25 2017 9.2.3.2	NYS Quarterly	The temperature of water in tanks with low temperature alarms supervised in accordance with NFPA 72, connected to a constantly attended location shall be inspected and recorded quarterly during the heating season when the mean temperature is less than 40°F (4.0°C).	PA 4046

NFPA 25 2011 9.2.4.2	NJ NYC Monthly	The temperature of water in tanks with low temperature alarms connected to a constantly attended location shall be inspected and recorded monthly during the heating season when the mean temperature is less than 40°F (4.4°C).	PA 4046

A7. Heating System — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.2.2.2	Daily	Tank heating systems without a supervised low temperature alarm connected to a constantly attended location shall be inspected daily during the heating season.	PA 4046
NFPA 25 2017 9.2.2.1	NYS Quarterly	Tank heating systems installed on tanks equipped with low water temperature alarms supervised in accordance with NFPA 72, connected to a constantly attended location shall be inspected quarterly during the heating season.	PA 4046
NFPA 25 2017 9.2.3.1	NJ NYC Weekly	Tank heating systems installed on tanks equipped with a supervised low water temperature alarm that are connected to a constantly attended location shall be inspected weekly.	PA 4046

A8. Heating System — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.3.2	Prior to Heating Season	The tank heating system, where provided, shall be tested prior to the heating season to make certain it is in the proper working order.	PA 4046
NFPA 25 2017 9.3.3*	Prior to Heating Season	Low water temperature signals, where provided, shall be tested prior to the heating season.	PA 4046
NFPA 25 2017 A.9.3.3		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 9.3.4*	NYS Prior to Heating Season	High water temperature limit switches on tank heating systems, where provided, shall be tested prior to the heating season.	PA 4046
NFPA 25 2014 9.3.4*	NJ NYC Monthly when heating system is in service	High water temperature limit switches on tank heating systems, where provided, shall be tested monthly whenever the heating system is in service.	PA 4046
NFPA 25 2014 A.9.3.4		The manufacturer's instructions should be consulted for guidance on testing. In some situations, it might not be possible to test the actual initiating device. In such cases, only the circuitry should be tested.	

A9. Pressure Gauges — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.7.2*	5 Years	Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.	PA 4047
NFPA 25 2017 A.13.2.7.2		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.2.7.3		Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.	

A10. Control Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1	Weekly	All valves shall be inspected weekly.	PA 4048
NFPA 25 2017 13.3.2.1.1	Monthly	Valves secured with locks or supervised in accordance with applicable NFPA standards shall be permitted to be inspected monthly.	PA 4048
NFPA 25 2017 13.3.2.1.2	NYS Quarterly	Valves that are electrically supervised shall be permitted to be inspected quarterly.	PA 4048
NFPA 25 2017 13.3.2.2*		The valve inspection shall verify that the valves are in the following condition: (1) In the normal open or closed position (2) * Sealed, locked, or supervised (3) Accessible (4) Post indicator valves (PIVs) are provided with correct wrenches (5) Free from external leaks (6) Provided with applicable identification	
NFPA 25 2017 A.13.3.2.2		Valves should be kept free of snow, ice, storage, or other obstructions so that access is ensured.	
NFPA 25 2017 A.13.3.2.2(2)		The purpose of the valve sealing program is as follows: (1) The presence of a seal on a control valve is a deterrent to closing a valve indiscriminately without obtaining the proper authority. (2) A broken or missing seal on a valve is cause for the plant inspector to verify that protection is not impaired and to notify superiors of the fact that a valve could have been closed without following procedures.	

A11. Control Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.1	Annually	Each control valve shall be operated annually through its full range and returned to its normal position.	PA 4048
NFPA 25 2017 13.3.3.2*		Post indicator valves shall be opened until spring or torsion is felt in the rod, indicating that the rod has not become detached from the valve.	
NFPA 25 2017 A.13.3.3.2		A proper wrench needs to be used for this test. Using an improper wrench such as a pipe wrench has resulted in damage to the operating nut. The use of break over bars and extensions on the wrench can damage the valve and/or the post. If the valve cannot be closed and reopened using the proper wrench with reasonable force, then some maintenance and/or repairs are necessary so the valve can be operated when needed in a fire event. These “spring tests” are made to verify that a post indicator valve is fully open. If an operator feels the valve is fully open, he or she should push in the “open” direction. The handle usually moves a short distance (approximately a one-quarter turn) and “springs” back toward the operator in a subtle move when released. This spring occurs when the valve gate pulls up tight against the top of its casting and the valve shaft (being fairly long) twists slightly. The spring indicates that the valve is fully opened and that the gate is attached to the handle. If the gate is jammed due to a foreign particle, the handle is not likely to spring back. If the gate is loose from the handle, the handle continues to turn in the “open” direction with little resistance.	
NFPA 25 2017 13.3.3.2.1		This test shall be conducted every time the valve is closed.	
NFPA 25 2017 13.3.3.3		Post indicator and outside screw and yoke valves shall be backed a one-quarter turn from the fully open position to prevent jamming.	
NFPA 25 2017 13.3.3.4*		A valve status test shall be conducted any time the control valve is closed and reopened at system riser.	
NFPA 25 2017 A.13.3.3.4		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.3.4.1	Annually	The operating stems of outside screw and yoke valves shall be lubricated annually.	PA 4048
NFPA 25 2017 13.3.4.2		The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.	

A12. Control Valve Supervisory Devices — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1.3	Quarterly	Control valve supervisory alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4048

A13. Control Valve Supervisory Devices — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.5.1	SemiAnnually	Valve supervisory switches shall be tested semiannually.	PA 4048
NFPA 25 2017 13.3.3.5.2		A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.	
NFPA 25 2017 13.3.3.5.3		The signal shall not be restored at any valve position except the normal position.	

A14. Water Storage Tank – Exterior — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.2.4.1*	Quarterly	The exterior of the tank, supporting structure, vents, foundation, and catwalks or ladders, where provided, shall be inspected quarterly for signs of obvious damage or weakening.	PA 4049
NFPA 25 2017 A.9.2.4.1		Lightning protection systems, where provided, should be inspected, tested, and maintained in accordance with NFPA 780.	
NFPA 25 2017 9.2.4.2	Quarterly	The area surrounding the tank and supporting structure, where provided, shall be inspected quarterly to ensure that the following conditions are met: (1) The area is free of combustible storage, trash, debris, brush, or material that could present a fire exposure hazard. (2) The area is free of the accumulation of material on or near parts that could result in accelerated corrosion or rot. (3) The tank and support are free of ice buildup. (4) The exterior sides and top of embankments supporting coated fabric tanks are free of erosion.	PA 4049
NFPA 25 2017 9.2.4.3	Annually	Expansion joints, where provided, shall be inspected annually for leaks and cracks.	PA 4049
NFPA 25 2017 9.2.4.4	Annually	The hoops and grillage of wooden tanks shall be inspected annually.	PA 4049
NFPA 25 2017 9.2.4.5	Annually	Exterior painted, coated, or insulated surfaces of the tank and supporting structure, where provided, shall be inspected annually for signs of degradation.	PA 4049

A15. Water Storage Tank – Interior — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.2.5.1.1*	3 Years	The interior of steel tanks without corrosion protection shall be inspected every 3 years.	PA 4049
NFPA 25 2017 A.9.2.5.1.1		To aid in the inspection and evaluation of test results, it is a good idea for the property owner or designated representative to stencil the last known date of an interior paint job on the exterior of the tank in a conspicuous place. A typical place is near one of the manways at eye level.	
NFPA 25 2017 9.2.5.1.2*	5 Years	The interior of all other types of tanks shall be inspected every 5 years.	PA 4049
NFPA 25 2017 A.9.2.5.1.2		If written verification of interior corrosion protection for a tank per NFPA 22 cannot be provided by the building owner, the interior of the tank should be inspected every 3 years.	
NFPA 25 2017 9.2.5.2		Where interior inspection is made by means of underwater evaluation, silt shall first be removed from the tank floor.	

NFPA 25 2017 9.2.5.3		The tank interior shall be inspected for signs of pitting, corrosion, spalling, rot, other forms of deterioration, waste materials and debris, aquatic growth, and local or general failure of interior coating.	
NFPA 25 2017 9.2.5.4		Steel tanks exhibiting signs of interior pitting, corrosion, or failure of coating shall be tested in accordance with 9.2.6.	
NFPA 25 2017 9.2.5.5*		Tanks on ring-type foundations with sand in the middle shall be inspected for evidence of voids beneath the floor.	
NFPA 25 2017 A.9.2.5.5		This inspection can be performed by looking for dents on the tank floor. Additionally, walking on the tank floor and looking for buckling of the floor will identify problem areas.	
NFPA 25 2017 9.2.5.6		The heating system and components including piping shall be inspected.	
NFPA 25 2017 9.2.5.7		The anti-vortex plate shall be inspected for deterioration or blockage.	
NFPA 25 2017 9.2.6		Tests During Interior Inspection. Where a drained interior inspection of a steel tank is required by 9.2.5.4, the following tests shall be conducted: (1) Evaluation of tank coatings shall be made in accordance with the adhesion test of ASTM D3359, Standard Test Methods for Measuring Adhesion by Tape Test, generally referred to as the "cross-hatch test." (2) Dry film thickness measurements shall be taken at random locations to determine the overall coating thickness. (3) Nondestructive ultrasonic readings shall be taken to evaluate the wall thickness where there is evidence of pitting or corrosion. (4) Interior surfaces shall be spot wet-sponge tested to detect pinholes, cracks, or other compromises in the coating. Special attention shall be given to sharp edges such as ladder rungs, nuts, and bolts. (5) Tank bottoms shall be tested for metal loss and/or rust on the underside by use of ultrasonic testing where there is evidence of pitting or corrosion. Removal, visual inspection, and replacement of random floor coupons shall be an acceptable alternative to ultrasonic testing. (6) Tanks with flat bottoms shall be vacuum-box tested at bottom seams in accordance with test procedures found in NFPA 22.	

A16. Water Storage Tank — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.4.1		Voids discovered beneath the floors of tanks shall be filled by pumping in grout or accessing the sand and replenishing.	
NFPA 25 2017 9.4.2		The tank shall be maintained full or at the designed water level.	
NFPA 25 2017 9.4.3		The hatch covers in the roofs and the door at the top of the frost-proof casing shall always be kept securely fastened with substantial catches as a protection against freezing and windstorm damage.	
NFPA 25 2017 9.4.4		No waste materials, such as boards, paint cans, trim, or loose material, shall be left in the tank or on the surface of the tank.	
NFPA 25 2017 9.4.5		Silt shall be removed during interior inspections or more frequently as needed to avoid accumulation to the level of the tank outlet.	

A17. Automatic Tank Fill Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.5.1.1		Automatic tank fill valves shall be inspected in accordance with Table 9.5.1.1.	

NFPA 25 2017 Table 9.5.1.1		**Table 9.5.1.1 Summary of Automatic Tank Fill Valve Inspection and Testing** **Item** / **Frequency** / **Reference** **Inspection** Strainers, filters, orifices (inspect/clean) — 5 years — 13.4.1.2 Enclosure (during cold weather) — Daily/weekly — 13.4.3.1.1 Exterior — Monthly — 13.4.3.1.3 Interior — Annually/5 years — 13.4.3.1.4 **Test** Automatic tank fill valve — Annually — 9.5.3	
NFPA 25 2017 13.4.1.2*	5 Years	Alarm valves and their associated strainers, filters, and restriction orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.	PA 4050
NFPA 25 2017 A.13.4.1.2		The system should be drained for internal inspection of valve components as follows: (1) Close the control valve (2) Open the main drain valve (3) Open the inspector's test valve (4) Wait for the sound of draining water to cease and for all gauges to indicate 0 psi (0 bar) before removing the handhole cover or dismantling any component.	
NFPA 25 2017 13.4.3.1.1	Daily	Valve enclosures for preaction valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C).	PA 4050
NFPA 25 2017 13.4.3.1.1.1	Weekly	Valve enclosures equipped with low temperature alarms shall be inspected weekly	PA 4050
NFPA 25 2017 13.4.3.1.3	Monthly	The preaction valve shall be externally inspected monthly to verify the following: (1) The valve is free from physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The valve seat is not leaking. (4) Electrical components are in service.	PA 4050
NFPA 25 2017 13.4.3.1.4	Annually	The interior of the preaction valve and the condition of detection devices shall be inspected annually when the trip test is conducted.	PA 4050
NFPA 25 2017 13.4.3.1.4.1	5 Years	Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.	PA 4050
NFPA 25 2017 9.5.1.1.1		OS&Y isolation valves that are a part of the automatic fill valves shall be inspected in accordance with Chapter 13.	
NFPA 25 2017 9.5.1.2	Monthly	Valves secured with locks or electrically supervised in accordance with applicable NFPA standards shall be inspected monthly.	PA 4050

A18. Automatic Tank Fill Valves — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.5.3*	Annually	Testing. All automatic tank fill valves shall be tested yearly in accordance with the following: (1) The valve shall be actuated automatically by lowering the water level in the tank. (2) The refill rate shall be measured and recorded.	PA 4050
NFPA 25 2017 A.9.5.3		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	

A19. Automatic Tank Fill Valves — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.5.2.1		Maintenance of all automatic tank fill valves shall be conducted by a qualified person following the manufacturer's instructions in accordance with the procedure and policies of the authority having jurisdiction.	
NFPA 25 2017 9.5.2.2		Rubber parts shall be replaced in accordance with the frequency required by the authority having jurisdiction and the manufacturer's instructions.	
NFPA 25 2017 9.5.2.3	Quarterly	Strainers shall be cleaned quarterly.	PA 4050

B. Component Action Requirements

B1. Component Action Requirements — Adjusted, Repaired Reconditioned, Replaced

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 9.6.1		Whenever a component in a water storage tank is adjusted, repaired, reconditioned, or replaced, the action required in Table 9.6.1 shall be performed.	
NFPA 25 2017 9.6.2		Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.	
NFPA 25 2017 9.6.3		These actions shall not require a design review, which is outside the scope of this standard.	

Table 9.6.1 Summary of Component Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Test Criteria
Tank Components				
Tank interior		X	X	Remove debris Verify integrity in conformance with NFPA 22
Tank exterior		X	X	Verify integrity in conformance with NFPA 22
Support structure		X	X	Verify integrity in conformance with NFPA 22
Heating system	X	X	X	Verify heating system is in conformance with NFPA 22
Catwalks and ladders	X	X	X	Verify integrity in conformance with NFPA 22
Hoops and grillage	X	X	X	Verify integrity in conformance with NFPA 22
Expansion joints	X	X	X	Verify integrity in conformance with NFPA 22
Overflow piping	X	X	X	Verify integrity in conformance with NFPA 22
Insulation		X	X	Verify integrity in conformance with NFPA 22
Alarm and Supervisory Components				
High and low water level	X	X	X	Operational test for conformance with NFPA 22 and/or *NFPA 72* and the design water levels
Water temperature	X	X	X	Operational test for conformance with NFPA 22 and/or *NFPA 72*
Enclosure temperature	X	X	X	Operational test for conformance with NFPA 22 and/or *NFPA 72*
Valve supervision	X	X	X	Operational test for conformance with NFPA 22 and/or *NFPA 72*
Fill and Discharge Components				
Automatic fill valves	X	X		Perform annual test in accordance with 9.5.3
Valves	X	X	X	See Chapter 13
Status Indicators				
Level indicators	X	X	X	Verify conformance with NFPA 22
Pressure gauges			X	Verify at 0 psi (0 bar) and at system working pressure

WATER STORAGE TANKS
GENERAL INFORMATION

PA 4045 / 12-20

Storage Tank ID: **Location:**

Dates Reviewed: **Original Installation Date:**

Storage Tank Information

Tank Provides Supply to:	
Tank Capacity (gallons)	
Tank Construction	
Tank Protection	
Heating System Description (if provided)	
Automatic Refill - Define automatic refill operation	
Storage Tank Signals – Identify all signals monitoring storage tank status including high level alarm, low level alarm, water temperature, and identify where the signals are monitored.	

Pressure Tanks

Tank Provides Supply to:	
Tank Capacity (gallons)	
Air Pressure (maintained in tank)	
Air Compressor Rating:	
Is Air Pressure supervised?	

Control Valves

Number of Control Valves _____

How are valves supervised? Sealed Locked Tamper switch

Are valves identified with signs? Yes No

Notes:

WATER STORAGE TANKS
HEATING SYSTEMS – INSPECTION/TESTING

PA 4046 / 12-20

Building ID: **Tank ID:**

- Use this form to document inspection and testing of water storage tank heating systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Heating System – Inspection – Daily/Weekly/Quarterly – {Reference C5A7} –** Tank heating systems shall be inspected during the heating season.

2. **Heating System – Testing – Annually – {Reference C5A8} –** The tank heating system, where provided, shall be tested prior to the heating season to make certain it is in the proper working order.

3. **Low Water Temperature Signals – Testing – Annually - {Reference C5A8} –** Low water temperature signals, where provided, shall be tested prior to the heating season.

4. **High Water Temperature Limit Switches – Testing – Annually - {Reference C5A8} –** High water temperature limit switches on tank heating systems, where provided, shall be tested prior to the heating season.

5. **Water Temperature – Inspection – Weekly/Monthly/Quarterly – {Reference C5A6} -** The temperature of water in tanks shall be inspected and recorded during the heating season when the mean temperature is less than 40°F (4.0°C). Record temperature in Notes.

S = Satisfactory **U = Unsatisfactory**

Equipment ID	Date	Inspector	Task/Result	Notes

WATER STORAGE TANKS
WATER LEVEL – INSPECTION / TESTING

PA 4047 / 12-20

Building ID: **Tank ID:**

- Use this form to document inspection and testing of water storage tank level equipment.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Water Level – Inspection– Monthly/Quarterly – {Reference C5A3} –** The water level in tanks not equipped with supervised water level alarms connected to a constantly attended location shall be inspected monthly. The water level in tanks equipped with supervised water level alarms that are supervised in accordance with NFPA 72 shall be inspected quarterly.

2. **Water Level – Testing – 5 Years – {Reference C5A4} –** Level indicators shall be tested every 5 years for accuracy and freedom of movement.

3. **Water Level Alarms – Testing – SemiAnnually/Annually – {Reference C5A5} –** High and low water level signals shall be tested annually.

4. **Pressure Gauges – Testing – 5 Years – {Reference C5A9} –** Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.

S = Satisfactory **U = Unsatisfactory**

Equipment ID	Date	Inspector	Task/Result	Notes

WATER STORAGE TANKS
CONTROL VALVES – INSPECTION/TESTING/MAINTENANCE

PA 4048 / 12-20

Building ID:

- Use this form to document inspection, testing, and maintenance of control valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Control Valves – Inspection – Weekly/Monthly/Quarterly – {Reference C5A10} –** Identify and inspect control valves. The valve inspection shall verify that the valves are in the following condition:
   (1) In the normal open or closed position
   (2) Sealed, locked, or supervised
   (3) Accessible
   (4) Post indicator valves (PIVs) are provided with correct wrenches
   (5) Free from external leaks
   (6) Provided with applicable identification

2. **Control Valves – Testing and Maintenance – Annually – {Reference C5A11} –** Identify and perform routine testing and maintenance of each control valve by operating through its full range and returning to its normal position. Lubricate operating stems of outside screw and yoke valves.

3. **Control Valve – Supervisory Devices – Inspection – Quarterly – {Reference C5A12} –** Identify and inspect control valve supervisory alarm devices to verify that they are free of physical damage.

4. **Control Valve – Supervisory Devices – Testing – SemiAnnually – {Reference C5A13} –** Identify and test valve supervisory switches demonstrating a distinctive signal when the valve is moved from its normal position.

S = Satisfactory **U = Unsatisfactory**

Control Valve ID / System ID	Date	Inspector	Task/Result	Notes

WATER STORAGE TANKS
TANK INTERIOR AND EXTERIOR – INSPECTIONS

PA 4049 / 12-20

Building ID: **Tank ID:**

- Use this form to document inspections water storage tanks.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Water Storage Tank – Exterior – Inspection – Quarterly – {Reference C5A14} –** The exterior of the tank, supporting structure, vents, foundation, and catwalks or ladders, where provided, shall be inspected quarterly for signs of obvious damage or weakening. The area surrounding the tank and supporting structure, where provided, shall be inspected quarterly to ensure that the following conditions are met:
   (1) The area is free of combustible storage, trash, debris, brush, or material that could present a fire exposure hazard.
   (2) The area is free of the accumulation of material on or near parts that could result in accelerated corrosion or rot.
   (3) The tank and support are free of ice buildup.
   (4) The exterior sides and top of embankments supporting coated fabric tanks are free of erosion.

2. **Water Storage Tank – Exterior – Inspection – Annually – {Reference C5A14} –** Expansion joints, where provided, shall be inspected annually for leaks and cracks. The hoops and grillage of wooden tanks shall be inspected annually. Exterior painted, coated, or insulated surfaces of the tank and supporting structure, where provided, shall be inspected annually for signs of degradation.

3. **Water Storage Tank – Interior – Inspection – 3 Years/5 Years – {Reference C5A15} –** The interior of steel tanks without corrosion protection shall be inspected every 3 years. The interior of all other types of tanks shall be inspected every 5 years.

S = Satisfactory **U = Unsatisfactory**

Equipment ID	Date	Inspector	Task/Result	Notes

WATER STORAGE TANKS

PA 4050 / 12-20

AUTOMATIC TANK FILL VALVES – INSPECTION/TESTING/MAINTENANCE

Building ID: **Tank ID:**

- Use this form to document inspection, testing, and maintenance of water storage automatic tank fill valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Automatic Tank Fill Valves – Valve Enclosure Heating – Inspection – Daily/Weekly – {Reference C5A17} –** Valve enclosures subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C). Valve enclosures equipped with low temperature alarms shall be inspected weekly.

2. **Automatic Tank Fill Valves – Valve – Exterior Inspection – Monthly – {Reference C5A17} –** The valve shall be externally inspected monthly to verify the following:
   (1) The valve is free from physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The valve seat is not leaking.
   (4) Electrical components are in service.

3. **Automatic Tank Fill Valves – Valve – Interior Inspection – Annually/5 Years – {Reference C5A17} –** The interior of the valve and the condition of detection devices shall be inspected annually when the trip test is conducted. Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.

4. **Automatic Tank Fill Valves – Control Valves – Inspection – Monthly – {Reference C5A17} –** Valves secured with locks or electrically supervised in accordance with applicable NFPA standards shall be inspected monthly.

5. **Automatic Tank Fill Valves – Testing – Annually – {Reference C5A18} –** All automatic tank fill valves shall be tested yearly in accordance with the following:
   (1) The valve shall be actuated automatically by lowering the water level in the tank.
   (2) The refill rate shall be measured and recorded.

6. **Automatic Tank Fill Valves – Maintenance – Quarterly – {Reference C5A19} –** Strainers shall be cleaned quarterly.

S = Satisfactory **U = Unsatisfactory**

Valve ID	Date	Inspector	Task/Result	Notes

CHAPTER 6 – FOAM FIRE EXTINGUISHING SYSTEMS

General Requirements for Foam Fire Extinguishing Systems (applicable at all facilities)

FCNYS 2020 904.7 — Foam Systems. Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 11 and NFPA 16 and their listing. Records of inspections and testing shall be maintained.

IFCNJ 2015 904.7.1 — System Test. Foam-extinguishing systems shall be inspected and tested at intervals in accordance with NFPA 25.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 904.7 — Maintenance. At least once a month, an inspection shall be conducted by a certificate of fitness holder to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system, shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

NYCFC 2014 904.7.2 — Commercial cooking installations. Foam fire extinguishing systems installed to protect a commercial cooking operation shall additionally comply with the requirements of FC904.11.

A. All Foam Fire Extinguishing Systems

A1. Existing Foam Extinguishing Systems – General Information

Update **Form PA 4054**

Frequency – Annually

Review General Information Form for Foam Fire Extinguishing Systems, update as required.

Confirm that operating and maintenance instructions, maintenance manuals, and a full set of drawings are provided as required. Additionally, confirm that staff working on the foam fire suppression systems are trained and knowledgeable.

NFPA 11 2016 12.8.1 — *Operation, system deactivation, and maintenance instructions and layouts shall be posted at control equipment with copies of each on file.*

NFPA 11 2016 12.8.2 — *All persons who are expected to inspect, test, maintain, or operate apparatus shall be thoroughly trained, and training shall be kept current.*

A2. New or Altered Foam Extinguishing Systems – General Information

Update **Form PA 4054**

Frequency – As Required

Review General Information Form for new Foam Fire Extinguishing Systems or update General Information Form for Foam Fire Extinguishing Systems that have been altered to include repairs and/or modifications to components.

NFPA 11 2016 12.8.1 — *Operation, system deactivation, and maintenance instructions and layouts shall be posted at control equipment with copies of each on file.*

NFPA 11 2016 12.8.2 — *All persons who are expected to inspect, test, maintain, or operate apparatus shall be thoroughly trained, and training shall be kept current.*

B. Foam-Water Sprinkler and Foam-Water Spray Systems

This section provides the requirements for inspection, testing, and maintenance for Foam-Water systems as specified in NFPA 16, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems. This section does not include all of the requirements for Foam Fire Suppression Systems for Aircraft Hangars or other Low-, Medium-, and High- Expansion Foam Fire Suppression Systems identified in Sections B and C below. Examples of Foam Water systems covered by this section are systems designed to protect transformers, building property, and storage tanks that utilize sprinkler or spray nozzle heads.

Foam-Water Sprinkler and Foam-Water Spray Systems in Aircraft Hangars must comply with the requirements provided in Chapter 18.

B1. Discharge Devices Location and Position — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 A.11.2.4		Directional-type foam-water discharge devices are quite often located in heavy traffic areas and are more apt to be dislocated compared to ordinary sprinkler locations. Of particular concern are low-level discharge devices in loading racks in and around low-level tankage and monitor-mounted devices that have been pushed out of the way for convenience. Inspection frequency might have to be increased accordingly.	
NFPA 25 2017 11.2.4.1	Annually	Foam-water discharge devices (sprinkler) shall be inspected visually and maintained to ensure that they are in place, continue to be aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion.	PA 4055
NFPA 25 2017 11.2.4.1	Monthly	Foam-water discharge devices (spray nozzle) shall be inspected visually and maintained to ensure that they are in place, continue to be aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion.	PA 4055
NFPA 25 2017 11.2.4.2		Where caps or plugs are required, the inspection shall confirm they are in place and free to operate as intended.	
NFPA 25 2017 11.2.4.3		Misaligned discharge devices shall be adjusted (aimed) by visual means, and the discharge patterns shall be inspected at the next scheduled flow test.	
NFPA 25 2017 11.2.4.4*		Inspection shall verify that unlisted combinations of discharge devices and foam concentrate have not been substituted.	
NFPA 25 2017 A.11.2.4.4		Discharge devices are listed or approved for particular foam concentrates.	

B2. Discharge Device (Open Spray Device) Location, Position, Obstruction — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.3.2.7.1	Annually	The discharge patterns from all of the open spray devices shall be observed to ensure that patterns are not impeded by plugged discharge devices and to ensure that discharge devices are correctly positioned and that obstructions do not prevent discharge patterns from covering surfaces to be protected.	PA 4055
NFPA 25 2017 11.3.2.7.2		Where obstructions occur, the piping and discharge devices shall be cleaned and the system retested.	
NFPA 25 2017 11.3.2.7.3		Discharge devices shall be permitted to be of different orifice sizes and types.	

B3. Strainer(s) — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.2.6.4	Quarterly	Foam concentrate strainers shall be inspected visually to ensure the blowdown valve is closed and plugged.	PA 4055
NFPA 25 2017 11.2.6.5	Annually	Baskets or screens shall be removed and inspected after each operation or flow test.	PA 4055

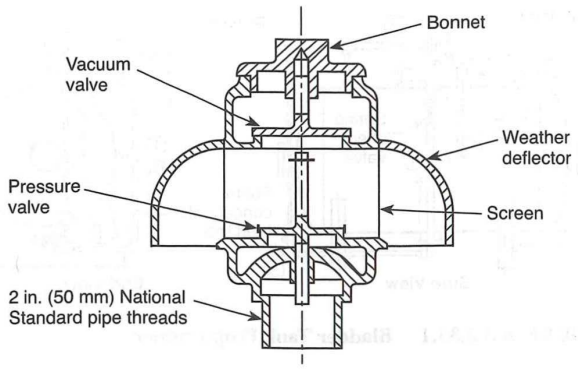
NFPA 25 2017 11.2.6.1	5 years	Mainline and individual discharge device strainers (basket or screen) shall be inspected every 5 years for damaged and corroded parts.	PA 4055

B4. Drainage in System Area — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.2.7	Quarterly	Drainage. The area beneath and surrounding a foamwater spray system shall be inspected to ensure that drainage facilities, such as trap sumps and drainage trenches, are not blocked, and retention embankments or dikes are in good repair.	PA 4055

B5. Proportioning System(s) — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 A.11.2.8		Proportioning systems might or might not include foam concentrate pumps. If pumps are part of the proportioning system, the driver, pump, and gear reducer should be inspected in accordance with the manufacturer's recommendations, and the inspection can include items such as lubrication, fuel, filters, oil levels, and clutches.	
	All Proportioners		
NFPA 25 2017 11.2.8.2	Monthly	Valves specified to be inspected shall be permitted to be open or closed, depending on specific functions within each foam-water sprinkler system.	PA 4056
NFPA 25 2017 11.2.8.3	Monthly	The position (open or closed) of valves shall be verified in accordance with specified operating conditions.	PA 4056
NFPA 25 2017 11.2.8.4*	Monthly	Inspection of the concentrate tank shall include verification that the quantity of foam concentrate satisfies the requirements of the original design.	PA 4056
NFPA 25 2017 A.11.2.8.4		In some cases, an adequate supply of foam liquid is available without a full tank. This is particularly true of foam liquid stored in nonmetallic tanks. If liquid is stored in metallic tanks, the proper liquid level should be one-half the distance into the expansion dome.	
NFPA 25 2017 11.2.8.5		Additional inspection requirements shall be performed as detailed for the proportioning systems specified in 11.2.8.	
NFPA 25 2017 11.2.8.5.1	**Standard Pressure Proportioners**		
NFPA 25 2017 11.2.8.5.1.1*		The pressure shall be removed before the inspection to prevent injury.	
NFPA 25 2017 A.11.2.8.5.1.1		The standard pressure proportioner is a pressure vessel. Although under normal standby conditions this type of proportioning system should not be pressurized, some installations allow for inadvertent pressurization. Pressure should be removed before inspection.	
NFPA 25 2017 11.2.8.5.1.2	Monthly	The inspection shall verify the following: (1) Ball drip valves (automatic drains) are free and opened. (2) External corrosion on foam concentrate storage tanks is not present.	PA 4056
NFPA 25 2017 11.2.8.5.2	**Bladder Tank Proportioners**		
NFPA 25 2017 11.2.8.5.2.1*		The pressure shall be removed before the inspection to prevent injury.	
NFPA 25 2017 A.11.2.8.5.2.1		The bladder tank proportioner is a pressure vessel. Where inspecting for a full liquid tank, the manufacturer's instructions should be followed. If inspected incorrectly, the tank sight gauges could indicate a full tank when the tank actually is empty of foam liquid. Some foam liquids, due to their viscosity, might not indicate true levels of foam liquid in the tank where inspected via the sight glass. CAUTION: Depending on system configuration, this type of proportioner system might be pressurized or nonpressurized under normal conditions. Pressure should be removed before inspection.	
NFPA 25 2017 11.2.8.5.2.2	Monthly	The inspection shall include the following: (1) Water control valves to foam concentrate tank (2) An inspection for external corrosion on foam concentrate storage tanks (3) An inspection for the presence of foam in the water surrounding the bladder (annual)	PA 4056

NFPA 25 2017 11.2.8.5.3	**Line Proportioners**		
NFPA 25 2017 11.2.8.5.3	Monthly	The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) An inspection for external corrosion on foam concentrate storage tanks	PA 4056
NFPA 25 2017 A.11.2.8.5.3(1)		See 11.2.6.1.	
NFPA 25 2017 A.11.2.8.5.3(2)		See Figure A.3.3.32  FIGURE A.3.3.32 Pressure Vacuum Vent.	
NFPA 25 2017 11.2.8.5.4	**Standard Balanced Pressure Proportioners**		
NFPA 25 2017 11.2.8.5.4	Monthly	The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) Verification that gauges are in good operating condition (4) Verification that sensing line valves are open (5) Verification that power is available to foam liquid pump	PA 4056
NFPA 25 2017 A.11.2.8.5.4(1)		See 11.2.6.1.	
NFPA 25 2017 A.11.2.8.5.4(2)		See Figure A.3.3.32	
NFPA 25 2017 11.2.8.5.5	**In-Line Balanced Pressure Proportioners**		
NFPA 25 2017 11.2.8.5.5	Monthly	The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) Verification that gauges are in good working condition (4) Verification that sensing line valves at pump unit and individual proportioner stations are open (5) Verification that power is available to foam liquid pump	PA 4056
NFPA 25 2017 A.11.2.8.5.5(1)		See 11.2.6.1.	
NFPA 25 2017 A.11.2.8.5.5(2)		See Figure A.3.3.32	
NFPA 25 2017 11.2.8.5.6	**Orifice Plate Proportioners**		
NFPA 25 2017 11.2.8.5.6	Monthly	The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) Verification that gauges are in good working condition (4) Verification that power is available to foam liquid pump	PA 4056
NFPA 25 2017 A.11.2.8.5.6(1)		See 11.2.6.1.	
NFPA 25 2017 A.11.2.8.5.6(2)		See Figure A.3.3.32	

B6. Pipes / Fittings / Hangars / Supports (Corrosion and Damage) — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.2.2	Annually	System Piping and Fittings. System piping and fittings shall be inspected for the following: (1) Mechanical damage (e.g., broken piping or cracked fittings) (2) External conditions (e.g., missing or damaged paint or coatings, rust, and corrosion) (3) Misalignment or trapped sections (4) Low-point drains (automatic or manual) (5) Location and condition of rubber-gasketed fittings	PA 4064
NFPA 25 2017 11.2.3	Annually	Hangers, Braces, and Supports. Hangers, braces, and supports shall be inspected for the following and repaired or replaced as necessary: (1) Condition (e.g., missing or damaged paint or coating, rust, and corrosion) (2) Secure attachment to structural supports and piping (3) Damaged or missing hangers, braces, and supports	PA 4064

B7. Control Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.3*		All system valves shall be protected from physical damage and shall be accessible.	
NFPA 25 2017 A.13.2.3		The valves are not required to be exposed. Doors, removable panels, or valve pits can be permitted to satisfy this requirement. Such equipment should not be obstructed by features such as walls, ducts, columns, direct burial, or stock storage.	
NFPA 25 2017 13.3.1*		Each control valve shall be identified and have a sign indicating the system or portion of the system it controls.	
NFPA 25 2017 A.13.3.1		Signs identifying underground fire service main control valves in roadway boxes should indicate the direction of valve opening, the distance and direction of the valve from the sign location (if the valve is subject to being covered by snow or ice), and the location of the wrench if not located with the sign.	
NFPA 25 2017 13.3.1.1		Systems that have more than one control valve that must be closed to work on a system shall have a sign on each affected valve referring to the existence and location of other valves.	
NFPA 25 2017 13.3.1.2*		When a normally open valve is closed, the procedures established in Chapter 15 shall be followed.	
NFPA 25 2017 A.13.3.1.2		Valves that normally are closed during cold weather should be removed and replaced with devices that provide continuous fire protection service.	
NFPA 25 2017 13.3.1.3		Each normally open valve shall be secured by means of a seal or a lock or shall be electrically supervised in accordance with the applicable NFPA standards.	
NFPA 25 2017 13.3.1.4		Normally closed valves shall be secured by means of a seal or shall be electrically supervised in accordance with the applicable NFPA standard.	
NFPA 25 2017 13.3.1.5		Sealing or electrical supervision shall not be required for hose valves.	
NFPA 25 2017 13.3.2.1	Weekly	All valves shall be inspected weekly.	PA 4058
NFPA 25 2017 13.3.2.1.1	Monthly	Valves secured with locks or supervised in accordance with applicable NFPA standards shall be permitted to be inspected monthly.	PA 4058
NFPA 25 2017 13.3.2.1.2	NYS Quarterly	Valves that are electrically supervised shall be permitted to be inspected quarterly.	PA 4058
NFPA 25 2017 13.3.2.2*		The valve inspection shall verify that the valves are in the following condition: (1) In the normal open or closed position (2) * Sealed, locked, or supervised (3) Accessible (4) Post indicator valves (PIVs) are provided with correct wrenches (5) Free from external leaks (6) Provided with applicable identification	
NFPA 25 2017 A.13.3.2.2		Valves should be kept free of snow, ice, storage, or other obstructions so that access is ensured.	

NFPA 25 2017 A.13.3.2.2(2)		The purpose of the valve sealing program is as follows: (1) The presence of a seal on a control valve is a deterrent to closing a valve indiscriminately without obtaining the proper authority. (2) A broken or missing seal on a valve is cause for the plant inspector to verify that protection is not impaired and to notify superiors of the fact that a valve could have been closed without following procedures.	

B8. Control Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.1	Annually	Each control valve shall be operated annually through its full range and returned to its normal position.	PA 4058
NFPA 25 2017 13.3.3.2*		Post indicator valves shall be opened until spring or torsion is felt in the rod, indicating that the rod has not become detached from the valve.	
NFPA 25 2017 A.13.3.3.2		A proper wrench needs to be used for this test. Using an improper wrench such as a pipe wrench has resulted in damage to the operating nut. The use of break over bars and extensions on the wrench can damage the valve and/or the post. If the valve cannot be closed and reopened using the proper wrench with reasonable force, then some maintenance and/or repairs are necessary so the valve can be operated when needed in a fire event. These “spring tests” are made to verify that a post indicator valve is fully open. If an operator feels the valve is fully open, he or she should push in the “open” direction. The handle usually moves a short distance (approximately a one-quarter turn) and “springs” back toward the operator in a subtle move when released. This spring occurs when the valve gate pulls up tight against the top of its casting and the valve shaft (being fairly long) twists slightly. The spring indicates that the valve is fully opened and that the gate is attached to the handle. If the gate is jammed due to a foreign particle, the handle is not likely to spring back. If the gate is loose from the handle, the handle continues to turn in the “open” direction with little resistance.	
NFPA 25 2017 13.3.3.2.1		This test shall be conducted every time the valve is closed.	
NFPA 25 2017 13.3.3.3		Post indicator and outside screw and yoke valves shall be backed a one-quarter turn from the fully open position to prevent jamming.	
NFPA 25 2017 13.3.3.4*		A valve status test shall be conducted any time the control valve is closed and reopened at system riser.	
NFPA 25 2017 A.13.3.3.4		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.3.4.1	Annually	The operating stems of outside screw and yoke valves shall be lubricated annually.	PA 4058
NFPA 25 2017 13.3.4.2		The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.	

B9. Control Valves Supervisory Devices — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1.3	Quarterly	Control valve supervisory alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4058
NFPA 25 2017 13.3.3.5.1	SemiAnnually	Valve supervisory switches shall be tested semiannually.	PA 4058
NFPA 25 2017 13.3.3.5.2		A distinctive signal shall indicate movement from the valve’s normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.	
NFPA 25 2017 13.3.3.5.3		The signal shall not be restored at any valve position except the normal position.	

B10. Pre-Action Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.1.1	Daily	Valve enclosures for preaction valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C).	PA 4057

NFPA 25 2017 13.4.3.1.1.1	Weekly	Valve enclosures equipped with low temperature alarms shall be inspected weekly.	PA 4057
NFPA 25 2017 13.4.3.1.2	Annually	Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.	PA 4057
NFPA 25 2017 13.4.3.1.3	Monthly	The preaction valve shall be externally inspected monthly to verify the following: (1) The valve is free from physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The valve seat is not leaking. (4) Electrical components are in service.	PA 4057
NFPA 25 2017 13.4.3.1.4	Annually	The interior of the preaction valve and the condition of detection devices shall be inspected annually when the trip test is conducted.	PA 4057
NFPA 25 2017 13.4.3.1.4.1	5 Years	Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.	PA 4057
NFPA 25 2017 13.4.3.1.5	5 Years	Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.	PA 4057
NFPA 25 2017 13.4.3.1.6		Preaction systems with auxiliary drains shall require a sign at the valve indicating the number of auxiliary drains and the location of each individual drain.	

B11. Pre-Action Valves Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.2.1*	Quarterly	The priming water level in supervised preaction systems shall be tested quarterly for compliance with the manufacturer's instructions.	PA 4059
NFPA 25 2017 A.13.4.3.2.1		High priming water levels can adversely affect the operation of supervisory air. Test the water level as follows: (1) Open the priming level test valve. (2) If water flows, drain it. (3) Close the valve when water stops flowing and air discharges. (4) If air discharges when the valve is opened, the priming water level could be too low. To add priming water, refer to the manufacturer's instructions.	
NFPA 25 2017 13.4.3.2.2	3 Years	Except for preaction systems covered by 13.4.3.2.4, every 3 years the preaction valve shall be trip tested with the control valve fully open.	PA 4059
NFPA 25 2017 13.4.3.2.3	Annually	During those years when full flow testing in accordance with 13.4.3.2.2 is not required, the preaction valve shall be trip tested with the control valve partially open.	PA 4059
NFPA 25 2017 13.4.3.2.4		Preaction valves protecting freezers shall be trip tested in a manner that does not introduce moisture into the piping in the freezer.	
NFPA 25 2017 13.4.3.2.5	3 Years	Preaction systems shall be tested once every 3 years for air leakage, using one of the following test methods: (1) Perform a pressure test at 40 psi (3.2 bar) for 2 hours. The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test. (2) With the system at normal system pressure, shut off the air source (compressor or shop air) for 4 hours. If the low air pressure alarm goes off within this period, the air leaks shall be addressed.	PA 4059
NFPA 25 2017 13.4.3.2.6*	Annually	Manual Operation. Manual actuation devices shall be operated annually.	PA 4059
NFPA 25 2017 13.4.3.2.7		Return to Service. After the annual trip test, the preaction system shall be returned to service in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.4.3.2.8		Grease or other sealing materials shall not be applied to the seating surfaces of preaction valves.	
NFPA 25 2017 13.4.3.2.9*		Records indicating the date the preaction valve was last tripped and the tripping time, as well as the individual and organization conducting the test, shall be maintained at a location or in a manner readily available for review by the authority having jurisdiction.	
NFPA 25 2017 A.13.4.3.2.9		Methods of recording maintenance include tags attached at each riser, records retained at each building, and records retained at one building in a complex.	
NFPA 25 2017 13.4.3.2.10	Quarterly	Low air pressure alarms, if provided, shall be tested quarterly in accordance with the manufacturer's instructions.	PA 4059
NFPA 25 2017 13.4.3.2.11	Annually	Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.	PA 4059
NFPA 25 2017 13.4.3.2.12	Annually	Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction valve trip test, in accordance with the manufacturer's instructions.	PA 4059

B12. Preaction Valves — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.3.3.1		Leaks causing drops in supervisory pressure sufficient to sound warning alarms and electrical malfunctions causing alarms to sound shall be located and repaired.	
NFPA 25 2017 13.4.3.3.2	Annually	During the annual trip test, the interior of the preaction valve shall be cleaned thoroughly and the parts replaced or repaired as necessary.	PA 4057
NFPA 25 2017 13.4.3.3.2.1	5 Years	Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.	PA 4057
NFPA 25 2017 13.4.3.3.3*	Annually and as needed	Auxiliary drains in preaction systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).	PA 4057
NFPA 25 2017 A.13.4.3.3.3		Suitable facilities should be provided to dispose of drained water. Low points equipped with a single valve should be drained as follows: (1) Open the low-point drain valve slowly. (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve. (3) Repeat this procedure until water ceases to discharge. (4) Replace plug or nipple and cap as necessary. Low points equipped with dual valves should be drained as follows: (1) Close the upper valve. (2) Open the lower valve, and drain the accumulated water. (3) Close the lower valve, open the upper valve, and allow time for additional water accumulation. (4) Repeat this procedure until water ceases to discharge. (5) Replace plug or nipple and cap in lower valve. Removing water from a deluge system is an essential part of a good maintenance program. Failure to keep these systems free of water can result in damage and expensive repairs to both the system and the building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after a system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals, depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily, with the frequency of operation decreasing depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry.	
NFPA 25 2017 13.4.3.3.4		Additional maintenance as required by the manufacturer's instructions shall be provided.	

B13. Deluge Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.1.1	Daily	Valve enclosures for deluge valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C).	PA 4060
NFPA 25 2017 13.4.4.1.1.1	Weekly	Valve enclosures equipped with low temperature alarms shall be inspected weekly.	PA 4060
NFPA 25 2017 13.4.4.1.2	Annually	Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.	PA 4060
NFPA 25 2017 13.4.4.1.3	Monthly	The deluge valve shall be externally inspected monthly to verify the following: (1) The valve is free from physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The valve seat is not leaking. (4) Electrical components are in service.	PA 4060
NFPA 25 2017 13.4.4.1.4	Annually	The interior of the deluge valve and the condition of detection devices shall be inspected annually when the trip test is conducted.	PA 4060
NFPA 25 2017 13.4.4.1.4.1	5 Years	Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.	PA 4060
NFPA 25 2017 13.4.4.1.5	5 Years	Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.	PA 4060

B14. Deluge Valves — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.2.1		Deluge valve flow tests shall incorporate full functionality of the system as a unit, including automatic and manual activation.	
NFPA 25 2017 13.4.4.2.2		Protection shall be provided for any devices or equipment subject to damage by system discharge during flow tests.	
NFPA 25 2017 13.4.4.2.3*	Annually	Except as provided by 13.4.4.2.3.1 and 13.4.4.2.3.2, each deluge valve shall be trip tested annually at full flow in warm weather and in accordance with the manufacturer's instructions.	PA 4061
NFPA 25 2017 A.13.4.4.2.3		Deluge valves in areas subject to freezing should be trip tested in the spring to allow time before the onset of cold weather for all water that has entered the system or condensation to drain to low points or back to the valve.	
NFPA 25 2017 13.4.4.2.3.1*		Where the nature of the protected property is such that water cannot be discharged for test purposes, an annual trip test shall be permitted to be conducted in a manner that does not necessitate discharge in the protected area.	
NFPA 25 2017 A.13.4.4.2.3.1		It is necessary that the full flow test incorporate the full functionality of the system, which would include any solenoid valves or other actuation devices. It was a common practice in the past to test the detection system or manual pull station up to the solenoid valve or actuator and to separately test the deluge valve and system after the solenoid valve or actuator. The detectors on the system can be tested separately as long as the functional test includes activation of the actuator or solenoid when it receives an actual or simulated signal.	
NFPA 25 2017 13.4.4.2.3.2		Where the nature of the protected property is such that water cannot be discharged unless protected equipment is shut down (e.g., energized electrical equipment), a full flow system test shall be conducted at the next scheduled shutdown.	
NFPA 25 2017 13.4.4.2.3.3		For full flow tests in accordance with 13.4.4.2.3.2, the test frequency shall not exceed 3 years.	
NFPA 25 2017 13.4.4.2.4	Annually	During the annual full flow test, the water discharge patterns from all of the open spray nozzles or sprinklers shall be observed to ensure that patterns are not impeded by plugged nozzles, that nozzles are correctly positioned, and that obstructions do not prevent discharge patterns from wetting surfaces to be protected.	PA 4061
NFPA 25 2017 13.4.4.2.4.1		Where the nature of the protected property is such that water cannot be discharged, the nozzles or open sprinklers shall be inspected for correct orientation.	
NFPA 25 2017 13.4.4.2.4.2		Where the nature of the protected property is such that water cannot be discharged unless protected equipment is shut down (e.g., energized electrical equipment), all open spray nozzles or sprinklers shall be inspected in accordance with 13.4.4.2.4 during the full flow system test conducted at the next scheduled shutdown.	
NFPA 25 2017 13.4.4.2.4.3		Where misalignment or obstructions occur, the piping and sprinklers or nozzles shall be adjusted and/or cleaned to correct the condition, and the system shall be retested.	
NFPA 25 2017 13.4.4.2.5		Full flow deluge valve tests, in accordance with 13.4.4.2.3 and 13.4.4.2.3.2, shall be conducted with the deluge system control valve fully open.	
NFPA 25 2017 13.4.4.2.6*		Deluge valve trip tests, in accordance with 13.4.4.2.3.1, shall be permitted to be conducted with the deluge system control valve partially open.	
NFPA 25 2017 13.4.4.2.8		Multiple Systems. The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply.	
NFPA 25 2017 13.4.4.2.9	Annually	Manual Operation. Manual actuation devices shall be operated annually.	PA 4061
NFPA 25 2017 13.4.4.2.10		Return to Service. After the annual trip test, the system shall be returned to service in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.4.4.2.11		Grease or other sealing materials shall not be applied to the seating surfaces of deluge valves.	
NFPA 25 2017 13.4.4.2.12*		Records indicating the date the deluge valve was last tripped and the tripping time, as well as the individual and organization conducting the test, shall be maintained at a location or in a manner readily available for review by the authority having jurisdiction.	
NFPA 25 2017 13.4.4.2.13	Quarterly	Low air pressure supervisory devices, if provided on the detection system, shall be tested quarterly in accordance with the manufacturer's instructions.	PA 4061
NFPA 25 2017 13.4.4.2.14	Annually	Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.	PA 4061
NFPA 25 2017 13.4.4.2.15	Annually	Automatic air pressure maintenance devices, if provided on the detection system, shall be tested yearly at the time of the annual deluge valve trip test, in accordance with the manufacturer's instructions.	PA 4061

B15. Deluge Valves — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.4.3.1		Leaks causing drops in supervisory pressure sufficient to sound warning alarms and electrical malfunctions causing alarms to sound shall be located and repaired.	
NFPA 25 2017 13.4.4.3.2	Annually	During the annual trip test, the interior of the deluge valve shall be cleaned thoroughly and the parts replaced or repaired as necessary.	PA 4060
NFPA 25 2017 13.4.4.3.2.1	5 Years	Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.	PA 4060
NFPA 25 2017 13.4.4.3.3*	Annually	Auxiliary drains in deluge systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).	PA 4060
NFPA 25 2017 A.13.4.4.3.3		Suitable facilities should be provided to dispose of drained water. Low points equipped with a single valve should be drained as follows: (1) Open the low-point drain valve slowly. (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve. (3) Repeat this procedure until water ceases to discharge. (4) Replace plug or nipple and cap as necessary. Low points equipped with dual valves should be drained as follows: (1) Close the upper valve. (2) Open the lower valve, and drain the accumulated water. (3) Close the lower valve, open the upper valve, and allow time for additional water accumulation. (4) Repeat this procedure until water ceases to discharge. (5) Replace plug or nipple and cap in lower valve. Removing water from a deluge system is an essential part of a good maintenance program. Failure to keep these systems free of water can result in damage and expensive repairs to both the system and the building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after a system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals, depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily, with the frequency of operation decreasing depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry.	
NFPA 25 2017 13.4.4.3.4		Additional maintenance as required by the manufacturer's instructions shall be provided.	

B16. Main Drain — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.2.5*	Annually	A main drain test shall be conducted annually for each water supply lead-in to a building waterbased fire protection system to determine whether there has been a change in the condition of the water supply.	PA 4064
NFPA 25 2017 A.13.2.5		Main drains are installed on system risers for one principal reason: to drain water from the overhead piping after the system is shut off. This allows the contractor or plant maintenance department to perform work on the system or to replace nozzles after a fire or other incident involving system operation. Data collected from the suction gauges during a fire pump flow test that test the water supply would satisfy the requirements for a main drain test. These drains also are used to determine whether there is a major reduction in waterflow to the system, such as could be caused by a major obstruction, a dropped gate, a valve that is almost fully closed, or a check valve clapper stuck to the valve seat. A satisfactory main drain test (i.e., one that reflects the results of previous tests) does not necessarily indicate an unobstructed passage, nor does it prove that all valves in the upstream flow of water are fully opened. However, these tests provide a reasonable level of confidence that	

		the water supply has not been compromised. The main drain test is conducted in the following manner: (1) Record the pressure indicated by the supply water gauge. (2) Close the alarm control valve on alarm valves. (3) Fully open the main drain valve. (4) After the flow has stabilized, record the residual (flowing) pressure indicated by the water supply gauge. (5) Close the main drain valve slowly. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.2.5.1		Where the lead-in to a building supplies a header or manifold serving multiple systems, a single main drain test shall be permitted.	
NFPA 25 2017 13.2.5.3		When there is a 10 percent reduction in full flow pressure when compared to the original acceptance test or previously performed tests, the cause of the reduction shall be identified and corrected if necessary.	
NFPA 25 2017 13.3.3.4*		A valve status test shall be conducted any time the control valve is closed and reopened at system riser.	
NFPA 25 2017 A.13.3.3.4		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.2.5.2		In systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves, the main drain test of at least one system downstream of the device shall be conducted on a quarterly basis.	

B17. Detection System — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.1.2		Other System Components. Fire pumps, water storage tanks, common components, and valves common to other types of water-based fire protection systems shall be inspected, tested, and maintained in accordance with Chapters 8, 9, and 13, respectively, and as specified in Table 11.1.1.2.	
NFPA 25 2017 13.9.1		Automatic detection equipment used to actuate waterbased fire protection systems shall be inspected, tested, and maintained in accordance with NFPA 72.	
NFPA 25 2017 13.9.2		Automatic detection equipment used to actuate waterbased fire protection systems that is not covered by NFPA 72 shall be inspected, tested, and maintained to ensure that the detectors are in place, securely fastened, and protected from corrosion, weather, and mechanical damage and to ensure that the communication wiring, control panels, or pneumatic tubing system is functional.	

B18. Foam-Water System(s) Operational Tests — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.3*	Annually	Operational Tests. Frequency of system tests shall be in accordance with Table 11.1.1.2.	PA 4062
NFPA 25 2017 A.11.3		Operational tests generally should be comprised of the following: (1) A detection/actuation test with no flow to verify that all components such as automated valves, foam and water pumps, and alarms operate properly (2) A water-only flow test to inspect piping continuity, discharge patterns, pressures, and line flushing (3) A foam flow test to verify solution concentration (4) Resetting of system to its normal standby condition, including draining of lines and filling of foam liquid tank See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 11.3.1*		Test Preparation. Precautions shall be taken to prevent damage to property during the test.	

NFPA 25 2017 A.11.3.1		The property owner or designated representative should take care to prevent damage to equipment or the structure during the test. Damage could be caused by the system discharge or by runoff from the test site. It should be verified that there is adequate and unobstructed drainage. Equipment should be removed or covered as necessary to prevent damage. Means such as curbing or sandbagging should be used to prevent entry of the foam-water solution.	
NFPA 25 2017 11.3.2*		Operational Test Performance.	
NFPA 25 2017 A.11.3.2		An alternative method for achieving flow can be permitted to be an installation as shown in Figure A.11.3.2. This type of testing does not verify system pipe conditions or discharge device performance but only the water supply, foam concentrate supply, and proportioning accuracy.	
NFPA 25 2017 11.3.2.1		Operational tests shall be conducted to ensure that the foam-water sprinkler system(s) responds as designed, both automatically and manually.	
NFPA 25 2017 11.3.2.2		The test procedures shall simulate anticipated emergency events so the response of the foam-water sprinkler system(s) can be evaluated.	
NFPA 25 2017 11.3.2.3		Where discharge from the system discharge devices would create a hazardous condition or conflict with local requirements, an approved alternate method to achieve full flow conditions shall be permitted.	
NFPA 25 2017 11.3.2.4		It shall be permissible to test the full flow discharge from foam-water deluge systems using water only in lieu of foam.	
NFPA 25 2017 11.3.2.5		Response Time. Under test conditions, the automatic fire detection systems, when exposed to a test source, shall operate within the requirements of NFPA 72 for the type of detector provided, and the response time shall be recorded.	
NFPA 25 2017 11.3.2.6		Discharge Time. The time lapse between operation of detection systems and water delivery time to the protected area shall be recorded for open discharge devices.	
NFPA 25 2017 11.3.3		Multiple Systems. The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply and concentrate pump.	
NFPA 25 2017 11.3.4	Annually	Manual actuation devices shall be tested annually.	PA 4062
NFPA 25 2017 11.3.6		Return to Service. After the full flow test, the foamwater sprinkler shall be returned to service and the foam concentrate tank shall be replenished to design level.	

B19. Foam-Water Solution (Concentration Testing) Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.3.5.1	Annually	During the operational test, a foam sample shall be taken.	PA 4062
NFPA 25 2017 11.3.5.2		Where approved by the authority having jurisdiction, simulated foam concentrates or alternative test systems shall be permitted to be substituted for actual foam concentrate, but system pressures and flows shall remain as described above and meet manufacturer's system requirements and recommendations.	
NFPA 25 2017 11.3.5.3		The foam sample shall be inspected by refractometric or other methods to verify concentration of the solution.	
NFPA 25 2017 11.3.5.4		Concentration shall be within 10 percent of the acceptance test results but in no case more than 10 percent below minimum design standards.	

B20. Foam-Water Sprinkler System Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.2.9	As per manufacturer's instructions	Foam Concentrate Samples. Samples shall be submitted in accordance with the manufacturer's recommended sampling procedures.	PA 4062
NFPA 25 2017 A.11.4		The maintenance items specified in the body of this standard are in addition to the typical inspection and test procedures indicated. Foam-water sprinkler systems are, as are all fire protection systems, designed to be basically maintenance free. There are, however, some areas that need special attention. Foam concentrate shelf life varies between liquids and is affected by factors such as heat, cold, dilution, contamination, and many others. As with all systems, common sense dictates those maintenance-sensitive areas that should be given attention. Routine testing and inspection generally dictate the need for additional maintenance items. Those maintenance items specified are key procedures that should be performed routinely.	
NFPA 25 2017 11.4.1		Maintenance of foam-water sprinkler systems shall be in accordance with the requirements of those chapters covering the specific component parts.	

NFPA 25 2017 11.4.3	**Standard Pressure Proportioner**		
NFPA 25 2017 11.4.3.1	5 Years	The ball drip (automatic-type) drain valves shall be disassembled, cleaned, and reassembled.	PA 4063
NFPA 25 2017 11.4.3.2*	10 Years	The foam liquid storage tank shall be drained of foam liquid and flushed.	PA 4063
NFPA 25 2017 A.11.4.3.2		Foam concentrates tend to settle out over time. Depending on the specific characteristics of the foam concentrate, sedimentation accumulates in the bottom of the storage vessel. This sediment can affect proportioning and foam concentrate integrity. Some concentrates tend to settle out more rapidly than others. If the annual samples indicate excessive sediment, flushing the tank could be required more frequently.	
NFPA 25 2017 11.4.3.3		Foam liquid shall be permitted to be salvaged and reused.	
NFPA 25 2017 11.4.3.4	10 Years	The foam liquid tank shall be inspected for internal and external corrosion and hydrostatically tested to the specified working pressure.	PA 4063
NFPA 25 2017 11.4.4	**Bladder Tank Proportioner**		
NFPA 25 2017 11.4.4.1	10 Years	Sight glass, where provided, shall be removed and cleaned.	PA 4063
NFPA 25 2017 11.4.4.2*	10 Years	The foam concentrate tank shall be hydrostatically tested to the specified working pressure.	PA 4063
NFPA 25 2017 A.11.4.4.2		Where hydrostatically testing bladder tanks, the generation of a pressure differential across the diaphragm should not be allowed. The manufacturer should be consulted for specific procedures.	
NFPA 25 2017 11.4.5	**Line Proportioner**		
NFPA 25 2017 11.4.5.1	10 Years	The foam concentrate tank shall be inspected for internal corrosion.	PA 4063
NFPA 25 2017 11.4.5.2	10 Years	Pickup pipes inside the tank shall be inspected for corrosion, separation, or plugging.	PA 4063
NFPA 25 2017 11.4.5.3	10 Years	The foam concentrate tank shall be drained and flushed.	PA 4063
NFPA 25 2017 11.4.5.4		Foam concentrate shall be permitted to be salvaged and reused.	
NFPA 25 2017 11.4.6	**Standard Balanced Pressure Proportioner**		
NFPA 25 2017 11.4.6.1		Pump Operation.	
NFPA 25 2017 11.4.6.1.1	Monthly	The foam concentrate pump shall be operated.	PA 4063
NFPA 25 2017 11.4.6.1.2		Foam concentrate shall be circulated back to the tank.	
NFPA 25 2017 11.4.6.2	5 Years	Servicing. Foam pumps, drive train, and drivers shall be serviced in accordance with the manufacturer's instructions and frequency but not at intervals of more than 5 years. Note: Also refer to manufacturer's instructions and frequency. Maintenance intervals other than preventive maintenance are not provided, as they depend on the results of the visual inspections and operational tests.	PA 4063
NFPA 25 2017 11.4.6.3	5 Years	Flushing. The diaphragm balancing valve shall be flushed through the diaphragm section with water or foam concentrate until fluid appears clear or new.	PA 4063
NFPA 25 2017 11.4.6.4		Corrosion and Sediment.	
NFPA 25 2017 11.4.6.4.1	10 Years	The foam concentrate tank shall be inspected internally for corrosion and sediment.	PA 4063
NFPA 25 2017 11.4.6.4.2		Excessive sediment shall require draining and flushing of the tank.	
NFPA 25 2017 11.4.7	**In-Line Balanced Pressure Proportioner**		
NFPA 25 2017 11.4.7.1		Pump Operation.	
NFPA 25 2017 11.4.7.1.1	Monthly	The foam concentrate pump shall be operated.	PA 4063
NFPA 25 2017 11.4.7.1.2		Foam concentrate shall be circulated back to the tank.	
NFPA 25 2017 11.4.7.2	5 Years	Servicing. Foam pumps, drive train, and drivers shall be serviced in accordance with the manufacturer's instructions and frequency but not at intervals of more than 5 years. Note: Also refer to manufacturer's instructions and frequency. Maintenance intervals other than preventive maintenance are not provided, as they depend on the results of the visual inspections and operational tests.	PA 4063

NFPA 25 2017 11.4.7.3	5 Years	Flushing. The diaphragm balancing valve shall be flushed through the diaphragm section with water or foam concentrate until fluid appears clear or new.	PA 4063
NFPA 25 2017 11.4.7.4		Corrosion and Sediment.	
NFPA 25 2017 11.4.7.4.1	10 Years	The foam concentrate tank shall be inspected internally for corrosion and sediment.	PA 4063
NFPA 25 2017 11.4.7.4.2		Excessive sediment shall require draining and flushing of the tank.	

B21. Pressure Vacuum Vents — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.4.8	5 Years	Pressure Vacuum Vents. The procedures specified in 11.4.8.1 through 11.4.8.13 shall be performed on pressure vacuum vents every 5 years.	PA 4064
NFPA 25 2017 11.4.8.1		The vent shall be removed from the expansion dome.	
NFPA 25 2017 11.4.8.2		The vent shall be inspected to ensure that the opening is not blocked and that dirt or other foreign objects do not enter the tank.	
NFPA 25 2017 11.4.8.3		The vent bonnet shall be removed.	
NFPA 25 2017 11.4.8.4		The vacuum valve and pressure valve shall be lifted out.	
NFPA 25 2017 11.4.8.5		The vent body shall be flushed internally, and the vacuum valve and the pressure valve shall be washed thoroughly.	
NFPA 25 2017 11.4.8.6		The vent shall be inspected to ensure that the screen is not clogged, and the use of any hard, pointed objects to clear the screen shall be avoided.	
NFPA 25 2017 11.4.8.7		If the liquid has become excessively gummy or solidified, the vent body and parts shall be soaked in hot soapy water.	
NFPA 25 2017 11.4.8.8		The vent body shall be turned upside down and drained thoroughly.	
NFPA 25 2017 11.4.8.9		Parts shall be dried by placing them in a warm and dry area or by using an air hose.	
NFPA 25 2017 11.4.8.10		Parts shall be sprayed with a light Teflon® coating, and the vent shall be reassembled.	
NFPA 25 2017 11.4.8.11		The use of any type of oil for lubrication purposes shall not be permitted.	
NFPA 25 2017 11.4.8.12		The vent bonnet shall be replaced, and the vent shall be turned upside down slowly a few times to ensure proper freedom of the movable parts.	
NFPA 25 2017 11.4.8.13		The vent shall be attached to the liquid storage tank expansion dome.	

C. Component Action Requirements

C1. Component Action Requirements — Adjusted / Repaired Reconditioned / Replaced

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 11.5.1		Whenever a component in a foam-water sprinkler system is adjusted, repaired, reconditioned, or replaced, the action required in Table 11.5.1 shall be performed.	
NFPA 25 2017 11.5.2		Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.	
NFPA 25 2017 11.5.3		The actions of 11.5.1 and 11.5.2 shall not require a design review, which is outside the scope of this standard.	

Table 11.5.1 Summary of Component Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Required Action
Water Delivery Components				
Pipe and fittings on open head system	X	X	X	Operational flow test
Pipe and fittings on closed head system	X	X	X	Hydrostatic test in conformance with NFPA 16
Discharge devices	X		X	(1) Inspect for leaks at system working pressure (2) Inspect for impairments at orifice
Fire department connections	X	X	X	See Chapter 13
Manual release	X	X	X	(1) Operational test (2) Inspect for leaks at system working pressure (3) Test all alarms
Foam Components				
Foam concentrate strainer(s)				See Chapter 13
Proportioning system(s)	X	X	X	Conduct flow test and inspect proportioning by refractometer test or equivalent
Water supply tank(s)				See Chapter 9
Foam concentrate	X		X	Submit 1 pint (473 mL) sample for laboratory analysis for conformance with manufacturer's specifications
Foam concentrate pump				See Chapter 8
Ball drip (automatic-type) drain valves				See Chapter 13
Foam concentrate tank	X	X	X	Inspect for condition; repair as appropriate
Bladder tank	X	X	X	Inspect water jacket for presence of foam concentrate
Alarm and Supervisory Components				
Vane-type waterflow	X	X	X	Operational test using inspector's test connection
Pressure switch–type waterflow	X	X	X	Operational test using inspector's test connection
Water motor gong			X	Operational test using inspector's test connection
Valve supervisory device			X	Test for conformance with NFPA 16 and/or *NFPA 72*
Detection system	X	X	X	Operational test for conformance with NFPA 16 and/or *NFPA 72*
Status-Indicating Components				
Gauges			X	Verify at 0 psi (0 bar) and system working pressure
Testing and Maintenance Components				
Main drain	X	X	X	Full flow main drain test
Auxiliary drains	X	X	X	Inspect for leaks at system working pressure
Inspector's test connection	X	X	X	Inspect for leaks at system working pressure
Structural Components				
Hanger/seismic bracing	X	X	X	Inspect for conformance with NFPA 16 and/or NFPA 13
Pipe stands	X	X	X	Inspect for conformance with NFPA 16 and/or NFPA 13
Informational Components				
Valve signs	X	X	X	Inspect for conformance with NFPA 16 and/or NFPA 13
Hydraulic placards	X	X	X	Inspect for conformance with NFPA 16 and/or NFPA 13

D. Low-, Medium-, and High-Expansion Foam Systems

This section provides the requirements for inspection, testing, and maintenance of fixed, semifixed, or portable low-, medium-, and high-expansion foam fire extinguishing systems for interior or exterior hazards not specified in Section B. Examples of systems covered by this section are systems designed to protect flammable and combustible liquid bulk storage tanks including yard foam houses, or building property.

D1. Low-, Medium- and High-Expansion Foam Systems — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 11 2016 A.12.1		Flushing of the concentrate pump might be necessary at periodic intervals or following complete discharge of concentrate.	
NFPA 11 2016 12.1.1	Annually	At least annually, all foam systems shall be thoroughly inspected and checked for correct operation.	PA 4055 PA 4056 PA 4057 PA 4059 PA 4060 PA 4061 PA 4062
NFPA 11 2016 12.1.2		The inspection shall include performance evaluation of the foam concentrate or premixed solution quality or both.	
NFPA 11 2016 12.1.3		Test results that deviate more than 10 percent from those recorded in acceptance testing shall be discussed immediately with the manufacturer.	
NFPA 11 2016 12.1.4		The goal of this inspection and testing shall be to ensure that the system is in full operating condition and that it remains in that condition until the next inspection.	
NFPA 11 2016 12.1.5		The inspection report, with recommendations, shall be filed with the owner.	
NFPA 11 2016 12.1.6		Between the regular service contract inspections or tests, the system shall be inspected by competent personnel following an approved schedule.	

D2. Foam-Producing Equipment — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 11 2016 A.12.2		Regular service contracts are recommended.	
NFPA 11 2016 12.2.1	Annually	Proportioning devices, their accessory equipment, and foam makers shall be inspected.	PA 4056 PA 4063
NFPA 11 2016 12.2.2	Annually	Fixed discharge outlets equipped with frangible seals shall be provided with inspection means to permit maintenance and for inspection and replacement of vapor seals.	PA 4055

D3. Foam Concentrate — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 11 2016 12.6.1	Annually	At least annually, an inspection shall be made of foam concentrates and their tanks or storage containers for evidence of excessive sludging or deterioration.	PA 4062
NFPA 11 2016 12.6.2		Samples of concentrates shall be sent to the manufacturer or qualified laboratory for quality condition testing.	
NFPA 11 2016 12.6.3		When the foam type and brand of foam are known, the quality testing shall confirm the product meets the manufacturer's specifications.	
NFPA 11 2016 12.6.4		Quantity of concentrate in storage shall meet design requirements, and tanks or containers shall normally be kept full, with space allowed for expansion.	

D4. Compressed Air Foam-Producing Equipment — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 11 2016 12.2.3.1	Annually	Compressed air foam-generating equipment and accessories shall be inspected annually.	PA 4064
NFPA 11 2016 12.2.3.2	Annually	Discharge devices shall be visually inspected annually for evidence of mechanical damage.	PA 4064

D5. High-Pressure Cylinders — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 11 2016 12.7.	5 Years	High-pressure cylinders used in compressed air foam systems shall not be recharged without a hydrostatic test (and remarking) if more than 5 years have elapsed from the date of the last test. Cylinders that have been in continuous service without discharging shall be permitted to be retained in service for a maximum of 12 years, after which they shall be discharged and retested before being returned to service.	PA 4064

D6. Piping — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 11 2016 12.3.1	Annually	Aboveground piping shall be examined to determine its condition and to verify that proper drainage pitch is maintained.	PA 4064 PA 4028
NFPA 11 2016 12.3.2		Pressure tests of normally dry piping shall be made when visual inspection indicates questionable strength due to corrosion or mechanical damage.	
NFPA 11 2016 12.3.3	5 Years	Underground piping shall be spot-checked for deterioration at least every 5 years.	PA 4028

D7. Strainers — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 11 2016 12.4		Strainers shall be inspected in accordance with manufacturer's instructions and shall be cleaned after each use and flow test.	PA 4055 PA 4056 PA 4057 PA 4060

D8. Control Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1	Weekly	All valves shall be inspected weekly.	PA 4058
NFPA 25 2017 13.3.2.1.1	Monthly	Valves secured with locks or supervised in accordance with applicable NFPA standards shall be permitted to be inspected monthly.	PA 4058
NFPA 25 2017 13.3.2.1.2	NYS Quarterly	Valves that are electrically supervised shall be permitted to be inspected quarterly.	PA 4058
NFPA 25 2017 13.3.2.2*		The valve inspection shall verify that the valves are in the following condition: (1) In the normal open or closed position (2) * Sealed, locked, or supervised (3) Accessible (4) Post indicator valves (PIVs) are provided with correct wrenches (5) Free from external leaks (6) Provided with applicable identification	

NFPA 25 2017 A.13.3.2.2		Valves should be kept free of snow, ice, storage, or other obstructions so that access is ensured.	
NFPA 25 2017 A.13.3.2.2(2)		The purpose of the valve sealing program is as follows: (1) The presence of a seal on a control valve is a deterrent to closing a valve indiscriminately without obtaining the proper authority. (2) A broken or missing seal on a valve is cause for the plant inspector to verify that protection is not impaired and to notify superiors of the fact that a valve could have been closed without following procedures.	

D9. Control Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.1	Annually	Each control valve shall be operated annually through its full range and returned to its normal position.	PA 4058
NFPA 25 2017 13.3.3.2*		Post indicator valves shall be opened until spring or torsion is felt in the rod, indicating that the rod has not become detached from the valve.	
NFPA 25 2017 A.13.3.3.2		A proper wrench needs to be used for this test. Using an improper wrench such as a pipe wrench has resulted in damage to the operating nut. The use of break over bars and extensions on the wrench can damage the valve and/or the post. If the valve cannot be closed and reopened using the proper wrench with reasonable force, then some maintenance and/or repairs are necessary so the valve can be operated when needed in a fire event. These “spring tests” are made to verify that a post indicator valve is fully open. If an operator feels the valve is fully open, he or she should push in the “open” direction. The handle usually moves a short distance (approximately a one-quarter turn) and “springs” back toward the operator in a subtle move when released. This spring occurs when the valve gate pulls up tight against the top of its casting and the valve shaft (being fairly long) twists slightly. The spring indicates that the valve is fully opened and that the gate is attached to the handle. If the gate is jammed due to a foreign particle, the handle is not likely to spring back. If the gate is loose from the handle, the handle continues to turn in the “open” direction with little resistance.	
NFPA 25 2017 13.3.3.2.1		This test shall be conducted every time the valve is closed.	
NFPA 25 2017 13.3.3.3		Post indicator and outside screw and yoke valves shall be backed a one-quarter turn from the fully open position to prevent jamming.	
NFPA 25 2017 13.3.3.4*		A valve status test shall be conducted any time the control valve is closed and reopened at system riser.	
NFPA 11 2016 12.5		Control valves, including all automatic and manual-actuating devices, shall be tested at regular intervals.	
NFPA 25 2017 13.3.4.1	Annually	The operating stems of outside screw and yoke valves shall be lubricated annually.	PA 4058
NFPA 25 2017 13.3.4.2		The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.	

D10. Control Valve Supervisory Devices — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1.3	Quarterly	Control valve supervisory alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4058
NFPA 25 2017 13.3.3.5.1	SemiAnnually	Valve supervisory switches shall be tested semiannually.	PA 4058
NFPA 25 2017 13.3.3.5.2		A distinctive signal shall indicate movement from the valve’s normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.	
NFPA 25 2017 13.3.3.5.3		The signal shall not be restored at any valve position except the normal position.	

FOAM FIRE EXTINGUISHING SYSTEMS
GENERAL INFORMATION

PA 4054 / 12-20

Building ID: **System ID:**

Date: **Original Installation Date:**

- **Provide details of foam suppression system including but not limited to;** hazard designed to be protected, details of foam solution discharge devices including manufacturer (hose lines, monitor nozzle, foam chamber, etc.), details of high expansion foam system including number and manufacturer of generators, details of initiating devices including manual release stations. Attach additional documentation as needed.

General

Foam System Type Make/Model/Manufacturer:	
Control Panel Location/Make/Manufacturer:	
Design Concentration:	
Foam Concentrate Storage Capacity	
Are Operating Instructions Posted?	
Proportioning System: (Standard Pressure, Standard Balanced Pressure, In-Line Balanced Pressure, Bladder Tank, Orifice Plate, Line Proportioner.)	
Foam Concentrate Pump – Make/Model	
Foam Discharge Device Description: (foam generator, foam chamber, monitor nozzle, etc.)	

Foam Water Sprinkler/Spray Systems

System Type (Wet, Dry, Deluge, Preaction)	
Design Criteria	
Make/Model of sprinkler/nozzle head	

Water Supply

Identify water supply source: (municipal system, fire pump, storage tank)	
Design pressure /	
Fire Pump ID / Location: (if supply is from a fire pump)	
Fire Pump Maintained by:	

Notes:

FOAM FIRE EXTINGUISHING SYSTEMS
DISCHARGE DEVICES / STRAINERS / DRAINAGE – INSPECTION / TESTING

PA 4055 / 12-20

Building ID:

- Use this form to document inspection and testing of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Discharge Devices Location and Position – Inspection – Annually – {Reference C6B1} –** Foam-water discharge devices (sprinkler) shall be inspected visually and maintained to ensure that they are in place, continue to be aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion.

2. **Discharge Devices Location and Position – Inspection – Monthly – {Reference C6B1} –** Foam-water discharge devices (spray nozzle) shall be inspected visually and maintained to ensure that they are in place, continue to be aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion.

3. **Discharge Device (Open Spray Device) – Location, Position, Obstruction – Testing – Annually – {Reference C6B2} –** The discharge patterns from all of the open spray devices shall be observed to ensure that patterns are not impeded by plugged discharge devices and to ensure that discharge devices are correctly positioned and that obstructions do not prevent discharge patterns from covering surfaces to be protected.

4. **Discharge Device (Fixed Discharge Outlets) – Inspection – Annually – {Reference C6D2} –** Fixed discharge outlets equipped with frangible seals shall be provided with inspection means to permit maintenance and for inspection and replacement of vapor seals.

5. **Strainer(s) – Inspection – Quarterly – {Reference C6B3} –** Foam concentrate strainers shall be inspected visually to ensure the blowdown valve is closed and plugged.

6. **Strainer(s) – Inspection – Annually – {Reference C6B3} –** Baskets or screens shall be removed and inspected after each operation or flow test.

7. **Strainer(s) – Inspection – 5 Years – {Reference C6B3} –** Mainline and individual discharge device strainers (basket or screen) shall be inspected every 5 years for damaged and corroded parts.

8. **Drainage in System Area – Inspection – Quarterly – {Reference C6B4} –** Drainage. The area beneath and surrounding a foamwater spray system shall be inspected to ensure that drainage facilities, such as trap sumps and drainage trenches, are not blocked, and retention embankments or dikes are in good repair.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS
PROPORTIONING SYSTEM(S) – INSPECTIONS

PA 4056 / 12-20

Building ID:

- Use this form to document inspection of foam-water sprinkler and foam-water spray proportioning systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Proportioning System(s) – All – Inspection – Monthly – {Reference C6B5}**
   - Valves specified to be inspected shall be permitted to be open or closed, depending on specific functions within each foam-water sprinkler system.
   - The position (open or closed) of valves shall be verified in accordance with specified operating conditions.
   - Inspection of the concentrate tank shall include verification that the quantity of foam concentrate satisfies the requirements of the original design.

2. **Proportioning System – Standard Pressure Proportioner – Inspection – Monthly – {Reference C6B5} –** The inspection shall verify the following:
   (1) Ball drip valves (automatic drains) are free and opened.
   (2) External corrosion on foam concentrate storage tanks is not present.

3. **Proportioning System – Bladder Tank Proportioner – Inspection – Monthly – {Reference C6B5}** – The inspection shall include the following:
   (1) Water control valves to foam concentrate tank
   (2) An inspection for external corrosion on foam concentrate storage tanks
   (3) An inspection for the presence of foam in the water surrounding the bladder (annual)

4. **Proportioning System – Line Proportioner – Inspection – Monthly – {Reference C6B5} –** The inspection shall include the following:
   (1) * Strainers
   (2) * Verification that pressure vacuum vent is operating freely
   (3) An inspection for external corrosion on foam concentrate storage tanks

5. **Proportioning System – Standard Balanced Pressure Proportioner – Inspection – Monthly – {Reference C6B5} –** The inspection shall include the following:
   (1) * Strainers
   (2) * Verification that pressure vacuum vent is operating freely
   (3) Verification that gauges are in good operating condition
   (4) Verification that sensing line valves are open
   (5) Verification that power is available to foam liquid pump

6. **Proportioning System – In-Line Balanced Pressure Proportioner – Inspection – Monthly – {Reference C6B5}** – The inspection shall include the following:
   (1) * Strainers
   (2) * Verification that pressure vacuum vent is operating freely
   (3) Verification that gauges are in good working condition
   (4) Verification that sensing line valves at pump unit and individual proportioner stations are open
   (5) Verification that power is available to foam liquid pump

7. **Proportioning System – Orifice Plate Proportioner – Inspection – Monthly – {Reference C6B5} –** The inspection shall include the following:
   (1) * Strainers
   (2) * Verification that pressure vacuum vent is operating freely
   (3) Verification that gauges are in good working condition
   (4) Verification that power is available to foam liquid pump

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS
PRE-ACTION VALVES – INSPECTIONS / MAINTENANCE

PA 4057 / 12-20

Building ID:

- Use this form to document inspection and maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Pre-Action Valves – Valve Enclosures – Inspection – Daily/Weekly – {Reference C6B10} –** Valve enclosures for preaction valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C). Valve enclosures equipped with low temperature alarms shall be inspected weekly.

2. **Pre-Action Valves – Low Temperature Alarms – Inspection – Annually – {Reference C6B10} –** Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.

3. **Pre-Action Valves – Exterior – Inspection – Monthly – {Reference C6B10} –** The preaction valve shall be externally inspected monthly to verify the following:
   (1) The valve is free from physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The valve seat is not leaking.
   (4) Electrical components are in service.

4. **Pre-Action Valves – Interior – Inspection – Annually/5 Years – {Reference C6B10} –** The interior of the preaction valve and the condition of detection devices shall be inspected annually when the trip test is conducted. Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.

5. **Pre-Action Valves – Strainers, Filters, Restricted Orifices, Diaphragm Chambers – Inspection – 5 Years – {Reference C6B10} –** Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.

6. **Pre-Action Valves – Valve Interior – Maintenance – Annually – {Reference C6B12} –** During the annual trip test, the interior of the preaction valve shall be cleaned thoroughly and the parts replaced or repaired as necessary. Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.

7. **Pre-Action Systems – Auxiliary Drains – Maintenance – Annually/After System Operation – {Reference C6B12} –** Auxiliary drains in preaction systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS
CONTROL VALVES – INSPECTION / TESTING / MAINTENANCE

PA 4058 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Control Valves – Inspection – Weekly/Monthly/Quarterly – {Reference C6B7} –** Identify and inspect control valves. The valve inspection shall verify that the valves are in the following condition:
   (1) In the normal open or closed position
   (2) Sealed, locked, or supervised
   (3) Accessible
   (4) Post indicator valves (PIVs) are provided with correct wrenches
   (5) Free from external leaks
   (6) Provided with applicable identification

2. **Control Valves – Testing / Maintenance – Annually – {Reference C6B8}** – Identify and perform routine testing and maintenance of each control valve by operating through its full range and returning to its normal position. Lubricate operating stems of outside screw and yoke valves.

3. **Control Valve – Supervisory Devices – Inspection – Quarterly – {Reference C6B9}** – Identify and inspect control valve supervisory alarm devices to verify that they are free of physical damage.

4. **Control Valve – Supervisory Devices – Testing – SemiAnnually – {Reference C2B9} –** Identify and test valve supervisory switches demonstrating a distinctive signal when the valve is moved from its normal position.

S = Satisfactory **U = Unsatisfactory**

Control Valve ID / System ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS
PRE-ACTION SYSTEMS – TESTING

PA 4059 / 12-20

Building ID:

- Use this form to document testing of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Pre-Action Valves – Priming Water Level – Testing – Quarterly – (Reference C6B11} –** The priming water level in supervised preaction systems shall be tested quarterly for compliance with the manufacturer's instructions.

2. **Pre-Action Valves – Trip Test – Testing – 3 Years – (Reference C6B11} –** Except for preaction systems covered by 13.4.3.2.4, every 3 years the preaction valve shall be trip tested with the control valve fully open.

3. **Pre-Action Valves – Trip Test – Testing – Annually – (Reference C6B11} –** During those years when full flow testing in accordance with 13.4.3.2.2 is not required, the preaction valve shall be trip tested with the control valve partially open.

4. **Pre-Action System – Air Leakage – Testing – 3 Years – (Reference C6B11} –** Preaction systems shall be tested once every 3 years for air leakage, using one of the following test methods:
   (1) Perform a pressure test at 40 psi (3.2 bar) for 2 hours. The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
   (2) With the system at normal system pressure, shut off the air source (compressor or shop air) for 4 hours. If the low air pressure alarm goes off within this period, the air leaks shall be addressed.

5. **Pre-Action System – Manual Operation – Testing – Annually – (Reference C6B11} –** Manual actuation devices shall be operated annually.

6. **Pre-Action Valves – Low Temperature Alarms – Testing – Annually – {Reference C6B11} –** Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.

7. **Pre-Action System – Low Air Pressure Alarms – Testing – Quarterly – (Reference C6B11} –** Low air pressure alarms, if provided, shall be tested quarterly in accordance with the manufacturer's instructions.

8. **Pre-Action System – Automatic Air Pressure Maintenance Devices – Testing – Annually – (Reference C6B11} –** Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction valve trip test, in accordance with the manufacturer's instructions.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS
DELUGE VALVES – INSPECTIONS / MAINTENANCE

PA 4060 / 12-20

Building ID:

- Use this form to document inspection and maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Deluge Valves – Valve Enclosures – Inspection – Daily/Weekly – {Reference C6B13} –** Valve enclosures for deluge valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C). Valve enclosures equipped with low temperature alarms shall be inspected weekly.

2. **Deluge Valves – Low Temperature Alarms – Inspection – Annually – {Reference C6B13} –** Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.

3. **Deluge Valves – Exterior – Inspection – Monthly – {Reference C6B13}** – The deluge valve shall be externally inspected monthly to verify the following:
   (1) The valve is free from physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The valve seat is not leaking.
   (4) Electrical components are in service.

4. **Deluge Valves – Interior – Inspection – Annually/5 Years – {Reference C6B13} –** The interior of the deluge valve and the condition of detection devices shall be inspected annually when the trip test is conducted. Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.

5. **Deluge Valves – Strainers, Filters, Restricted Orifices, Diaphragm Chambers – Inspection – 5 Years – {Reference C6B13} –** Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.

6. **Deluge Valves – Valve Interior – Maintenance – Annually/5 Years – {Reference C6B15}** – During the annual trip test, the interior of the deluge valve shall be cleaned thoroughly and the parts replaced or repaired as necessary. Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.

7. **Deluge Systems – Auxiliary Drains – Maintenance – Annually/After System Operation – {Reference C6B15} –** Auxiliary drains in deluge systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed)..

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS
DELUGE SYSTEMS – TESTING

PA 4061 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Deluge Valves – Trip Test – Testing – Annually – (Reference C6B14}** – Except as provided by 13.4.4.2.3.1 and 13.4.4.2.3.2, each deluge valve shall be trip tested annually at full flow in warm weather and in accordance with the manufacturer's instructions.
   - During the annual full flow test, the water discharge patterns from all of the open spray nozzles or sprinklers shall be observed to ensure that patterns are not impeded by plugged nozzles, that nozzles are correctly positioned, and that obstructions do not prevent discharge patterns from wetting surfaces to be protected.
   - Full flow deluge valve tests, in accordance with 13.4.4.2.3 and 13.4.4.2.3.2, shall be conducted with the deluge system control valve fully open.
   - Multiple Systems. The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply.

2. **Deluge System – Manual Operation – Testing – Annually – (Reference C6B14} –** Manual actuation devices shall be operated annually.

3. **Deluge Valves – Low Temperature Alarms – Testing – Annually – {Reference C6B11} –** Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.

4. **Deluge System – Low Air Pressure Supervisory Devices – Testing – Quarterly – (Reference C6B11} –** Low air pressure supervisory devices, if provided on the detection system, shall be tested quarterly in accordance with the manufacturer's instructions.

5. **Deluge System – Automatic Air Pressure Maintenance Devices – Testing – Annually – (Reference C6B11} –** Automatic air pressure maintenance devices, if provided on the detection system, shall be tested yearly at the time of the annual deluge valve trip test, in accordance with the manufacturer's instructions.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM-WATER SPRINKLER AND FOAM-WATER SPRAY SYSTEMS
OPERATIONAL TESTS – TESTING

PA 4062 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Foam-Water System(s) Operational Tests – Testing – Annually – {Reference C6B18}** – Operational tests generally should be comprised of the following:
   (1) A detection/actuation test with no flow to verify that all components such as automated valves, foam and water pumps, and alarms operate properly
   (2) A water-only flow test to inspect piping continuity, discharge patterns, pressures, and line flushing
   (3) A foam flow test to verify solution concentration
   (4) Resetting of system to its normal standby condition, including draining of lines and filling of foam liquid tank

- Operational tests shall be conducted to ensure that the foam-water sprinkler system(s) responds as designed, both automatically and manually.
- The test procedures shall simulate anticipated emergency events so the response of the foam-water sprinkler system(s) can be evaluated.
- Response Time. Under test conditions, the automatic fire detection systems, when exposed to a test source, shall operate within the requirements of NFPA 72 for the type of detector provided, and the response time shall be recorded.
- Discharge Time. The time lapse between operation of detection systems and water delivery time to the protected area shall be recorded for open discharge devices.
- Multiple Systems. The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply and concentrate pump.

2. **Manual Actuation Devices – Testing – Annually – {Reference C6B18}** – Manual actuation devices shall be tested annually.

3. **Foam-Water Solution (Concentration Testing) – Testing – Annually - {Reference C6B19}** – During the operational test, a foam sample shall be taken. The foam sample shall be inspected by refractometric or other methods to verify concentration of the solution. Concentration shall be within 10 percent of the acceptance test results but in no case more than 10 percent below minimum design standards.

4. **Foam Concentrate – Maintenance – As Per Manufacturer's Instructions – {Reference C6B20} -** Foam Concentrate Samples. Samples shall be submitted in accordance with the manufacturer's recommended sampling procedures.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS
PROPORTIONING SYSTEM(S) – MAINTENANCE

PA 4063 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Proportioning System – Standard Pressure Proportioner – Maintenance – {Reference C6B20}

(a) 5 Years – The ball drip (automatic-type) drain valves shall be disassembled, cleaned, and reassembled.
(b) 10 Years – The foam liquid storage tank shall be drained of foam liquid and flushed.
(c) 10 Years – The foam liquid tank shall be inspected for internal and external corrosion and hydrostatically tested to the specified working pressure.

2. Proportioning System – Bladder Tank Proportioner – Maintenance – {Reference C6B20}

(a) 10 Years – Sight glass, where provided, shall be removed and cleaned.
(b) 10 Years – The foam concentrate tank shall be hydrostatically tested to the specified working pressure.

3. Proportioning System – Line Proportioner – Maintenance – {Reference C6B20}

(a) 10 Years – The foam concentrate tank shall be inspected for internal corrosion.
(b) 10 Years – Pickup pipes inside the tank shall be inspected for corrosion, separation, or plugging.
(c) 10 Years – The foam concentrate tank shall be drained and flushed.

4. Proportioning System – Standard Balanced Pressure Proportioner – Maintenance – {Reference C6B20}

(a) Monthly – The foam concentrate pump shall be operated.
(b) 5 Years – Servicing. Foam pumps, drive train, and drivers shall be serviced in accordance with the manufacturer's instructions and frequency but not at intervals of more than 5 years.
(c) 5 Years – Flushing. The diaphragm balancing valve shall be flushed through the diaphragm section with water or foam concentrate until fluid appears clear or new.
(d) 10 Years – The foam concentrate tank shall be inspected internally for corrosion and sediment.

5. Proportioning System – In-Line Balanced Pressure Proportioner – Maintenance – {Reference C6B20}

(a) Monthly – The foam concentrate pump shall be operated.
(b) 5 Years – Servicing. Foam pumps, drive train, and drivers shall be serviced in accordance with the manufacturer's instructions and frequency but not at intervals of more than 5 years.
(c) 5 Years – Flushing. The diaphragm balancing valve shall be flushed through the diaphragm section with water or foam concentrate until fluid appears clear or new.
(d) 10 Years – The foam concentrate tank shall be inspected internally for corrosion and sediment.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

FOAM FIRE EXTINGUISHING SYSTEMS — PA 4064 / 12-20

PIPES/FITTINGS/HANGARS/SUPPORTS – MAIN DRAIN - PRESSURE VACUUM VENTS
COMPRESSED AIR FOAM-PRODUCING EQUIPMENT – INSPECTION / TESTING / MAINTENANCE

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Pipes/Fittings – Inspection – Annually – {Reference C6B6}** – System Piping and Fittings. System piping and fittings shall be inspected for the following:
   (1) Mechanical damage (e.g., broken piping or cracked fittings)
   (2) External conditions (e.g., missing or damaged paint or coatings, rust, and corrosion)
   (3) Misalignment or trapped sections
   (4) Low-point drains (automatic or manual)
   (5) Location and condition of rubber-gasketed fittings

2. **Hangars/Supports – Inspection – Annually - {Reference C6B6} –** Hangers, Braces, and Supports. Hangers, braces, and supports shall be inspected for the following and repaired or replaced as necessary:
   (1) Condition (e.g., missing or damaged paint or coating, rust, and corrosion)
   (2) Secure attachment to structural supports and piping
   (3) Damaged or missing hangers, braces, and supports

3. **Main Drain – Testing – Annually – {Reference C6B16} –** A main drain test shall be conducted annually for each water supply lead-in to a building waterbased fire protection system to determine whether there has been a change in the condition of the water supply. When there is a 10 percent reduction in full flow pressure when compared to the original acceptance test or previously performed tests, the cause of the reduction shall be identified and corrected if necessary.

4. **Pressure Vacuum Vents – Maintenance – 5 Years – {Reference C6B21} –** Pressure Vacuum Vents. The procedures specified in 11.4.8.1 through 11.4.8.13 shall be performed on pressure vacuum vents every 5 years including but not limited to:
   - The vent shall be inspected to ensure that the opening is not blocked and that dirt or other foreign objects do not enter the tank.
   - The vent body shall be flushed internally, and the vacuum valve and the pressure valve shall be washed thoroughly.
   - The vent shall be inspected to ensure that the screen is not clogged, and the use of any hard, pointed objects to clear the screen shall be avoided.

5. **Compressed Air Foam-Producing Equipment – Inspection – Annually – {Reference C6D4}**
   (a) Compressed air foam-generating equipment and accessories shall be inspected annually.
   (b) Discharge devices shall be visually inspected annually for evidence of mechanical damage.

6. **High-Pressure Cylinders – Testing – 5 Years / 12 Years – {Reference C6D5}** – High-pressure cylinders used in compressed air foam systems shall not be recharged without a hydrostatic test (and remarking) if more than 5 years have elapsed from the date of the last test. Cylinders that have been in continuous service without discharging shall be permitted to be retained in service for a maximum of 12 years, after which they shall be discharged and retested before being returned to service.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

CHAPTER 7 – CARBON DIOXIDE EXTINGUISHING SYSTEMS

General Requirements for Carbon Dioxide Extinguishing Systems (applicable at all facilities)

NFPA 12 2015 4.8.4*	Persons who inspect, test, maintain, or operate carbon dioxide fire-extinguishing systems shall be thoroughly trained in the functions they perform.
NFPA 12 2015 A.4.8.4	Persons who inspect, test, or maintain carbon dioxide systems should be trained and periodically tested for competence in the functions they perform. Attending training programs offered by equipment manufacturers and other training organizations should be considered
IFCNJ 2015 904.8.	Carbon dioxide extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 12 and their listing. Records of inspections and testing shall be maintained.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 904.8.	Carbon dioxide fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 12, as modified by FC Appendix B, and their listing. **Total flooding carbon dioxide fire extinguishing systems shall not be installed to protect hazards within normally occupied areas.** Existing total flooding carbon dioxide fire extinguishing systems installed to protect normally occupied areas prior to the effective date of this code may be continued in service until July 1, 2013, after which they shall be removed from service, and a replacement fire extinguishing system shall be installed, where required, in accordance with the Building Code, this code or other applicable laws, rules and regulations.

A1. Existing Carbon Dioxide Systems General Information — Update — Form PA 4066

Frequency – Annually

Review General Information Form for all Carbon Dioxide Systems, update as required.

A2. New or Altered Carbon Dioxide Systems General Information — Update — Form PA 4066

Frequency – As Required

Review General Information Form for new Carbon Dioxide Systems or update General Information Form for Carbon Dioxide Systems that have been altered to include repairs and/or modifications to components.

A3. Carbon Dioxide Systems — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2014 904.8.1	Monthly	**At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order.** A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.	PA 4067

NFPA 12 2015 4.8.1*	Monthly	At least every 30 days, an inspection shall be conducted to assess the system's operational condition.	PA 4067
NFPA 12 2015 A.4.8.1		An inspection of the system is a quick check to give reasonable assurance that the extinguishing system is fully charged and operable. It is done by seeing that the system is in place, that it has not been actuated or tampered with, and that there is no obvious physical damage or condition to prevent operation. As a minimum, the inspection should determine the following: (1) High-pressure cylinders are in place and properly secured. (2) For a low-pressure storage unit, the pressure gauge shows normal pressure, that the tank shutoff valve is open, and that the pilot pressure supply valve is open. The liquid level gauge should be observed. If at any time a container shows a loss of more than 10 percent, it should be refilled, unless the minimum gas requirements are still provided. (3) Carbon dioxide storage is connected to discharge piping and actuators. (4) All manual actuators are in place and tamper seals are intact. (5) Nozzles are connected, properly aligned, and free from obstructions and foreign matter (6) Detectors are in place and free from foreign matter and obstructions. (7) The system control panel is connected and showing "normal-ready" condition.	

A4. Carbon Dioxide System — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2014 904.8.1	SemiAnnually NYC	At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. **A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.**	PA 4067
FCNYS 2020 904.8.1	Annually NJ NYS	System Test. Systems shall be inspected and tested for proper operation at 12-month intervals.	PA 4067
NFPA 12 2015 4.8.3.1		Test and Maintenance Procedures. A manufacturer's test and maintenance procedure shall be provided to the owner for testing and maintenance of the system. This procedure shall provide for the initial testing of the equipment as well as for periodic test inspection and maintenance of the system. Actuation, impairment, and restoration of this protection shall be reported promptly to the authority having jurisdiction.	
NFPA 12 2015 4.8.3.2	Annually	The following shall be verified by competent personnel at least annually using available documentation required in 4.4.2.14: (1) Check and test the carbon dioxide system for operation. (2) Check that there have been no changes to the size, type, and configuration of the hazard and system. (3) Check and test all time delay for operation. (4) Check and test all audible alarm for operation. (5) Check and test all visible signal for operation. (6) Check that all warning signs are installed in accordance with 4.3.2. (7) Check to ensure that the procedures in 4.5.6 are appropriate and the devices in 4.5.6 are operable. (8) Check and test each detector using methods specified in NFPA 72.	PA 4067
NFPA 12 2015 4.8.3.2.1		The goal of this maintenance and testing shall be not only to ensure that the system is in full operating condition, but shall also indicate the probable continuance of that condition until the next inspection.	
NFPA 12 2015 4.8.3.2.2		Discharge tests shall be made when any maintenance indicates their advisability.	
NFPA 12 2015 4.8.3.2.3		Prior to testing, safety procedures shall be reviewed. (See Section 4.3 and A.4.3.)	
NFPA 12 2015 4.8.3.3		A maintenance report with recommendations shall be filed with the owner.	
NFPA 12 2015 4.8.3.4*		Any penetrations made through the enclosure protected by the carbon dioxide total flooding system shall be sealed immediately. The method of sealing shall restore the original fire resistance rating of the enclosure.	
NFPA 12 2015 A.4.8.3.4		The method of sealing should not introduce any new hazards.	

NFPA 12 2015 A.4.8.3	Annually	The manufacturer's maintenance procedure should be guided by the following outline: (1) System (a) Check overall physical appearance. (b) Disarm system prior to test. (2) Hazard (a) Check size. (b) Check configuration. (c) Check unclosable openings. (d) Check fuels. (e) Check other aspects that could affect effectiveness of the extinguishing systems. (3) Supervised circuits (a) Exercise all functions. (b) Check all electrical or pneumatic supervisory circuits for proper operation. (4) Control panel (a) Exercise all functions. (b) Check supervision, if applicable, of each circuit (including releasing devices) as recommended by the manufacturer. (5) Power supply – Check routing, circuit breakers, fuses, disconnects. (6) Emergency power (a) Check battery condition. (b) Check charger operation; check fuse. (c) Check automatic changeover. (d) Check maintenance of generator (if one exists) (7) Detectors (a) Test each detector using heat or smoke or manufacturer's approved test device. (b) Electric type (i) Clean and adjust smoke detector and check sensitivity. (ii) Check wiring condition. (c) Pneumatic type – Check tightness of tubing and operation of mercury checks, using manometer. (8) Time delay (a) Exercise functions. (b) Check time limit. (c) Check that timer will complete its cycle even if wiring between it and the detector circuit is interrupted. (9) Alarms (a) Test for operation (audible and visible). (b) Check to see that warning signs are properly displayed. (10) Selector (directional) valves (a) Exercise functions. (b) Reset properly. (11) Release devices (a) Check for complete closure of dampers. (b) Check doors; check for any doors that are blocked open. (12) Equipment shutdown (a) Test shutdown function (b) Check adequacy (all necessary equipment included). (13) Manual releases (a) Mechanical type (i) Check pull, force, and length of pull required. (ii) Operate and adjust all devices. (iii) Check tightness of connectors. (iv) Check condition of conduit. (v) Check condition and operation of corner pulleys. (b) Electric type (i) Test manual release. (ii) Check that covers are in place. (c) Check pneumatic releases. (d) Check accessibility during fire. (e) Separate main and reserve manual pulls that require only one operation, to obtain discharge of either main or reserve supply of gas. (f) Clearly mark and identify all manual releases. (14) Piping (a) Check security; check that piping is adequately supported. (b) Check condition; check for any corrosion. (15) Nozzles	PA 4068

		(a) Check orientation and orifice size; make sure they are unchanged from original design. (b) Check security. (c) Check seals where needed. (d) Ensure orifice of nozzle is free of rust, debris (i.e., bugs, spider webs), and so forth, and clean/repair/replace if necessary (16) Containers (a) Check physical condition; check for any sign of corrosion. (b) Check the contents for weight by acceptable methods for each cylinder or low-pressure tank. (If the contents are more than 10 percent below the normal capacity, refilling is required. Proper operation of the liquid level gauge should be verified.) (c) Check that cylinders are securely held in position. (d) Check hydrostatic test date. (e) Check cylinder connectors for integrity and condition. (f) Check weights and cables of mechanical release system. (g) Release devices; check for proper arrangement and security. (h) Check explosive release devices; check replacement date and check condition. (17) Tests (a) Perform recommended discharge tests if there is any question about the adequacy of the system. (b) Perform recommended full discharge test if cylinder hydrostatic test is required. (18) Return all parts of system to full service. (19) Give certificate of inspection to owner. Regular service contracts with the manufacturer or installing company are recommended. Work should be performed by personnel thoroughly trained and regularly engaged in providing such services.	
NFPA 12 2015 4.4.2.14		The system owner shall maintain an instruction and maintenance manual that includes a full sequence of operation, and a full set of system drawings and calculations shall be maintained in a protective enclosure.	

A5. Hoses — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 904.8.4	Annually	System Hoses. System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At five-year intervals, all hoses shall be tested.	PA 4068
IFCNJ 2015 904.8.4.1		Hoses shall be tested at not less than 2,500 pounds per square inch (psi) (17 238 kPa) for high-pressure systems and at not less than 900 psi (6206 kPa) for low-pressure systems.	
NFPA 12 2015 4.8.2.3	5 Years	All system hose, including those used as flexible connectors, shall be tested every 5 years in accordance with 4.8.2.	PA 4068
NFPA 12 2015 4.8.2.1		All system hose, including those used as flexible connectors, shall be tested at 2500 psi (17,239 kPa) for high pressure systems and at 900 psi (6205 kPa) for low-pressure systems.	
NFPA 12 2015 4.8.2.2		Hose shall be tested as follows: (1) The hose shall be removed from any attachment (2) Hose for hand lines shall be checked for electrical continuity between couplings. (3) The hose assembly shall then be placed in a protective enclosure designed to permit visible observation of the test. (4) The hose shall be completely filled with water before testing (5) Pressure shall then be applied at a rate-of-pressure rise to reach the test pressure within 1 minute (6) The test pressure shall be maintained for 1 full minute (7) Observations shall then be made to note any distortion or leakage. (8) If the test pressure has not dropped and if the couplings have not moved, the pressure shall be released. (9) The hose assembly shall be considered to have passed the hydrostatic test if no permanent distortion has taken place. (10) Hose assembly passing the test shall be completely dried internally. (11) If heat is used for drying, the temperature shall not exceed 150°F (66°C). (12) Hose assemblies failing this test shall be marked, destroyed, and replaced with new assemblies. (13) Hose assemblies passing this test shall be marked with the date of the test on the hose.	

A6. High-Pressure Cylinders — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 904.8.2	SemiAnnually	High-pressure cylinders shall be weighed and the date of the last hydrostatic test shall be verified at six-month intervals. Where a container shows a loss in original content of more than 10 percent, the cylinder shall be refilled or replaced.	PA 4068
NFPA 12 2015 4.8.3.5.1	SemiAnnually	At least semiannually, all high-pressure cylinders shall be weighed, and the date of the last hydrostatic test noted. (See 4.6.5.2.)	
NFPA 12 2015 4.8.3.5.2		If, at any time, a container shows a loss in net content of more than 10 percent, it shall be refilled or replaced.	
NFPA 12 2015 4.6.5.2*		High-pressure cylinders used in fire-extinguishing systems shall not be recharged without a hydrostatic test (and remarking) if more than 5 years have elapsed from the date of the last test.	
NFPA 12 2020 4.6.5.2.1		Cylinders continuously in service without discharging shall be permitted to be retained in service for a maximum of 12 years from the date of the last hydrostatic test.	
NFPA 12 2015 4.6.5.2.2		At the end of 12 years, cylinders continuously in service without discharging shall be discharged and retested before being returned to service.	

A7. Low-Pressure Container Liquid Levels — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 904.8.3	Weekly	The liquid-level gauges of low-pressure containers shall be observed at one-week intervals. Where a container shows a content loss of more than 10 percent, the container shall be refilled to maintain the minimum gas requirements.	PA 4068
NFPA 12 2015 4.8.3.6.1	Weekly	At least weekly, the liquid level gauges of low-pressure containers shall be observed.	
NFPA 12 2015 4.8.3.6.2		If at any time a container shows a loss of more than 10 percent, it shall be refilled, unless the minimum gas requirements are still provided.	

A8. Auxiliary Equipment — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 904.8.5	Annually	Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure that such components are in proper operating condition.	PA 4068

CARBON DIOXIDE FIRE EXTINGUISHING SYSTEMS
GENERAL INFORMATION

PA 4066 / 12-20

Building ID: **System ID:**

Date: **Original Installation Date:**

General

CO_2 System Make/Model/Manufacturer:	
Control Panel Location/Make/Manufacturer:	
CO_2 Design Concentration:	
Describe Areas Protected – Include above suspended ceilings and/or below raised floors:	
Number of CO_2 Cylinders Installed: (main & reserve)	
Number of CO_2 Cylinders required for Discharge:	
Document Weights of all Cylinders with CO_2 Agent:	
CO_2 Agent Pressure:	

System Initiation

Number and Type of Fire Detection Devices:	
Location of Manual Release Station:	
Sequence of Operation: (provide additional documentation if needed)	

Notes:

CARBON DIOXIDE FIRE EXTINGUISHING SYSTEMS
INSPECTION / TESTING

PA 4067 / 12-20

Building ID: **System ID:**

- Use this form to document inspection/testing/maintenance of carbon dioxide fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information including documentation of deficiencies identified, date corrected, and who performed the work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Carbon Dioxide Systems – Inspection – Monthly – {Reference C7A3} – At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. An inspection of the system is a quick check to give reasonable assurance that the extinguishing system is fully charged and operable. It is done by seeing that the system is in place, that it has not been actuated or tampered with, and that there is no obvious physical damage or condition to prevent operation. As a minimum, the inspection should determine the following:

1. High-pressure cylinders are in place and properly secured.	2. For a low-pressure storage unit, the pressure gauge shows normal pressure, that the tank shutoff valve is open, and that the pilot pressure supply valve is open. The liquid level gauge should be observed. If at any time a container shows a loss of more than 10 percent, it should be refilled, unless the minimum gas requirements are still provided.
3. Carbon dioxide storage is connected to discharge piping and actuators.	4. All manual actuators are in place and tamper seals are intact.
5. Nozzles are connected, properly aligned, and free from obstructions and foreign matter	6. Detectors are in place and free from foreign matter and obstructions.
7. The system control panel is connected and showing "normal-ready" condition.	

2. Carbon Dioxide Systems – Testing – SemiAnnually – {Reference C7A4} – Systems shall be inspected, tested, serviced and otherwise maintained in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

3. Carbon Dioxide Systems – Testing – Annually – {Reference C7A4} – Systems shall be inspected and tested for proper operation at 12-month intervals. The following shall be verified by competent personnel at least annually

1. Check and test the carbon dioxide system for operation.	2. Check that there have been no changes to the size, type, and configuration of the hazard and system.
3. Check and test all time delay for operation.	4. Check and test all audible alarm for operation.
5. Check and test all visible signal for operation.	6. Check that all warning signs are installed in accordance with 4.3.2.
7. Check to ensure that the procedures in 4.5.6 are appropriate and the devices in 4.5.6 are operable. (4.5.6 pertains to audible and visible warning alarms)	8. Check and test each detector using methods specified in NFPA 72.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

CARBON DIOXIDE FIRE EXTINGUISHING SYSTEMS

PA 4068 / 12-20

SYSTEM MAINTENANCE
HOSES / CONTAINERS / AUXILIARY EQUIPMENT

Building ID: **System ID:**

- Use this form to document inspection/testing/maintenance of carbon dioxide fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information including documentation of deficiencies identified, date corrected, and who performed the work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **System Maintenance – Maintenance – Annually or As Required – {Reference C7A4} -** A manufacturer's test and maintenance procedure shall be provided to the owner for testing and maintenance of the system. The manufacturer's maintenance procedure should be guided by but is not limited to the following:

System - Check overall physical appearance.	Hazard - Check other aspects that could affect effectiveness of the extinguishing systems.	Supervised circuits - Exercise all functions.
Control panel - Exercise all functions.	Emergency power - Check automatic changeover.	Detectors - Test each detector using heat or smoke or manufacturer's approved test device.
Time delay - Check time limit.	Alarms – Test for operation (audible and visible).	Release devices – Check for complete closure of dampers.
Release devices – Check doors; check for any doors that are blocked open.	Equipment shutdown - Test shutdown function	Manual releases - Test manual release.
Piping - Check condition; check for any corrosion.	Nozzles - Check orientation and orifice size; make sure they are unchanged from original design.	Containers - Check that cylinders are securely held in position.

2. **Hoses - Inspection/Testing – Annually/5 Years – (Reference C7A5}**
   - System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested.
   - All system hose, including those used as flexible connectors, shall be tested every 5 years

3. **High-Pressure Cylinders - Inspection/Maintenance – SemiAnnually – {Reference C7A6} -** High-pressure cylinders shall be weighed and the date of the last hydrostatic test shall be verified at six-month intervals. Where a container shows a loss in original content of more than 10 percent, the cylinder shall be refilled or replaced. Record the weight and the hydrostatic test date in Notes

4. **Low-Pressure Container Liquid Levels - Inspection/Maintenance – Weekly – {Reference C7A7} -** The liquid-level gauges of low-pressure containers shall be observed at one-week intervals. Where a container shows a content loss of more than 10 percent, the container shall be refilled to maintain the minimum gas requirements. Record the pressure in Notes.

5. **Auxiliary Equipment – Testing – Annually – {Reference C7A8} -** Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure that such components are in proper operating condition.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

CHAPTER 8 – HALON FIRE EXTINGUISHING SYSTEMS

General Requirements for Halon Fire Extinguishing Systems (applicable at all facilities)

IFCNJ 2015 904.9 — Halon Systems: Halogenated extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 12A and their listing. Records of inspections and testing shall be maintained.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 904.9 — Halon Systems: **It shall be unlawful to install a halon fire extinguishing system.** Existing halon fire extinguishing systems shall be periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 12A and their listing.

A1. Existing Halon Systems General Information — Update — Form PA 4070

Frequency – Annually

Review General Information Form for Halon Systems, update as required.

Confirm that the as-built instruction, maintenance manual, and a full set of drawings are provided as required:

NFPA 12A 2015 5.1.2.5 — *An as-built instruction and maintenance manual that includes a full sequence of operation and a full set of drawings and calculations shall be maintained in a clearly identified protective enclosure at or near the system control panel. thoroughly trained in the functions they perform.*

A2. New or Altered Valves General Information — Update — Form PA 4070

Frequency – As Required

Complete General Information Form for new Halon Systems or update General Information Form for Halon Systems that has been altered to include repairs and/or modifications to components.

Confirm that the as-built instruction, maintenance manual, and a full set of drawings are provided as required:

NFPA 12A 2015 5.1.2.5 — *An as-built instruction and maintenance manual that includes a full sequence of operation and a full set of drawings and calculations shall be maintained in a clearly identified protective enclosure at or near the system control panel. thoroughly trained in the functions they perform.*

A3. Halon Systems — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2014 904.9.1	NYC Monthly /	Maintenance. **At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order**. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.	PA 4071

NYCFC 2014 904.9.1	NYC SemiAnnually	Maintenance. At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system **shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.**	PA 4071
NFPA 12A 2015 6.1.1	SemiAnnually	At least semiannually, all systems shall be thoroughly inspected, tested, and documented for proper operation by trained competent personnel. Tests shall be in accordance with the appropriate NFPA or Canadian standards.	PA 4071
IFCNJ 2015 904.9.1	NJ NYS Annually	System Test: Systems shall be **inspected and tested** for proper operation at 12-month intervals.	PA 4071
NFPA 12A 2015 6.1.2		The documented report with recommendations shall be filed with the owner.	
NFPA 12A 2015 6.1.3		The documented report shall be permitted to be stored and accessed using paper or electronic media	
NFPA 12A 2015 6.1.4		The agent quantity and pressure of refillable containers shall be checked. If a container shows a loss in net weight of more than 5 percent or a loss in pressure (adjusted for temperature) of more than 10 percent, it shall be refilled or replaced. When the amount of agent in the container is determined by special measuring devices in lieu of weighing, these devices shall be listed.	
NFPA 12A 2015 6.1.5		All halon removed from refillable containers during service or maintenance procedures shall be collected for recycling.	
NFPA 12A 2015 6.1.6	SemiAnnually	Factory-charged nonrefillable containers that do not have a means of pressure indication shall be weighed at least semiannually. If a container shows a loss in net weight of more than 5 percent, it shall be replaced. All factory-charged nonrefillable containers removed from useful service shall be returned for recycling of the agent.	PA 4071
NFPA 12A 2015 6.1.7		The weight and pressure of the container shall be recorded on a tag attached to the container.	
NFPA 12A 2015 A.6.1		Some protected area conditions could require inspections more frequent than semiannually. A service contract with an approved fire protection contractor is recommended. The inspection and test is to be conducted in accordance with the manufacturer's recommendations and procedures and appropriate NFPA standards and guides. Inspection criteria include but are not limited to the following: (1) Detection. All detectors are to be checked for proper alarm, supervision, and trouble functions. (2) Actuation. (a) Remove automatic actuation controls from agent containers. Test detection system to operate the necessary circuit(s) to simulate agent release. (b) Operate all manual devices to simulate agent release. (c) After testing, reset and reinstall all actuation controls. (3) Containers. (a) Examine all containers for evidence of corrosion or mechanical damage. (b) Check container bracketing and supports to determine that their condition is satisfactory. (4) Piping and Nozzles. (a) Examine piping for any evidence of corrosion. (b) Examine pipe hangers and straps to see that the piping is securely supported. (c) Check nozzles for proper position and alignment and determine that the orifices are clear and unobstructed. (d) Check nozzle seals, if applicable, for signs of deterioration and replace if necessary. (5) Auxiliary Equipment. (a) Operate all auxiliary and supplementary components such as switches, door and window releases, interconnected valves, damper releases, air-handling equipment shutdown, and supplementary alarms to ensure that they are in proper operating condition. (b) Return all devices to normal "operating" condition after testing.	
NFPA 12A 2015 6.5.1		These systems shall be maintained in full operating condition at all times. Use, impairment, and restoration of this protection shall be reported promptly to the authority having jurisdiction.	
NFPA 12A 2015 6.5.2		Any troubles or impairments shall be corrected at once by competent personnel.	
NFPA 12A 2015 6.5.3		Any penetrations made through the halon-protected enclosure shall be sealed immediately. The method of sealing shall restore the original fire resistance rating and tightness of the enclosure.	

A4. Containers — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2014 904.9.2	SemiAnnually	Containers. The extinguishing agent quantity and pressure of containers shall be checked at least on a semiannual basis. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure (adjusted for temperature) of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.	PA 4071
NFPA 12A 2015 6.2.1		DOT, CTC, or similar design Halon 1301 cylinders shall not be recharged without a retest if more than 5 years have elapsed since the date of the last test and inspection.	
NFPA 12A 2015 6.2.1.1		The retest shall be permitted to consist of a complete visual inspection as described in the CFR, Title 49.	
NFPA 12A 2015 6.2.2	5 Years	Cylinders continuously in service without discharging shall be given a complete external visual inspection every 5 years, in accordance with Compressed Gas Association Pamphlet C-6, Section 3, except that the cylinders need not be emptied or stamped while under pressure.	PA 4071
		Visual inspection defined by the Compressed Gas Association Pamphlet C-6, Section 3: 3.1. Corrosion or pitting – Loss of wall thickness in a cylinder by corrosive media. 3.1.1 Crevice corrosion – Corrosion that occurs in the area of the intersection of the footring or headring with the cylinder. 3.1.2 Isolated pitting – Isolated pits of small diameter that do not effectively weaken a cylinder. 3.1.3 Line corrosion – Corrosion that results in a continuous patter or when pits are connected to others in a narrow band or line. This condition is more serious than isolated pitting. 3.1.4 General corrosion – Corrosion that covers considerable surface areas of the cylinder. 3.2 Cuts, gouges, or digs – Deformations in a cylinder caused by contact with a sharp object so as to cut into or upset the metal of the cylinder, decreasing the wall thickness at that point. 3.3 Cylinder, high and low pressure – High pressure cylinders are those with a marked service pressure of 900 psi (6210 kPa) or greater; low pressure cylinders are those with a marked service pressure less than 900 psi (6210 kPa). 3.4 Cylinder disposition – The following definitions apply to terms for the disposition of cylinders failing visual inspection. 3.4.1 Condemned – Scrap, no longer fit for service. 3.4.2 Rejected – Not fit for service in present condition. Note – Rejected cylinders may be requalified by either additional testing to verify adequacy of cylinder for continued service or by reheat treatment, repair, or rebuilding to correct the defect as specified in 49 CFR 180 Subpart C.	
NFPA 12A 2015 6.2.3		Where external visual inspection indicates that the container has been damaged, additional strength tests shall be required. CAUTION: If additional tests used include hydrostatic testing, containers should be thoroughly dried before refilling.	
NFPA 12A 2015 6.2.4		Before recharging a container, a visual inspection of its interior shall be performed.	

A5. Hose — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 904.9.3	Annually	System Hoses. System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At five-year intervals, all hoses shall be tested.	PA 4072
NFPA 12A 2015 6.3	Annually	All system hoses shall be examined annually for damage. If visual examination shows any deficiency, the hose shall be immediately replaced or tested as specified in 6.3.1.	PA 4072

A6. Hose — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2014 904.9.3.1	5 Years	Test procedure. For Halon 1301 systems, hoses shall be tested at not less than 1,500 psi (10 343 kPa) for 600 psi (4137 kPa) charging pressure systems and not less than 900 psi (6206 kPa) for 360 psi (2482 kPa) charging pressure systems. For Halon 1211 hand-hose line systems, hoses shall be tested at 2,500 psi (17 238 kPa) for high-pressure systems and 900 psi (6206 kPa) for low-pressure systems.	PA 4072
NFPA 12A 2015 6.3.2	5 Years	All hoses shall be tested every 5 years in accordance with 6.3.1.	PA 4072
NFPA 12A 2015 6.3.1		All hoses shall be tested at 1500 psi (10342 kPa) for 600 psi (4137 kPa) charging pressure systems, and at 900 psi (6205 kPa) for 360 psi (2482 kPa) charging pressure systems. The test shall be performed as follows: (1) Remove the hose from any attachment. (2) The hose assembly is then to be placed in a protective enclosure (3) The hose must be completely filled with water before testing. (4) Pressure then is applied at a rate-of-pressure rise to reach the test pressure within a minimum of 1 minute. The test pressure is to be maintained for 1 full minute. Observations are then made to note any distortion or leakage (5) If the test pressure has not dropped or if the couplings have not moved, the pressure is released. The hose assembly is then considered to have passed the hydrostatic test if no permanent distortion has taken place. (6) Hose assembly passing the test must be completely dried internally. If heat is used for drying, the temperature must not exceed 150°F (66°C). (7) Hose assemblies failing a hydrostatic test must be destroyed. They shall be replaced with new assemblies. (8) Each hose assembly passing the hydrostatic test shall be marked to show the date of test.	

A7. Room Enclosure — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 12A 2015 6.4	SemiAnnually	Enclosure Inspection. At least every 6 months the halon protected enclosure shall be thoroughly inspected to determine if penetrations or other changes have occurred that could adversely affect halon leakage.	PA 4072
NFPA 12A 2015 6.4.1		Where the inspection indicates that conditions exist that could result in inability to maintain the halon concentration, they shall be corrected. If uncertainty still exists, the enclosures shall be retested for integrity.	

A8. Auxiliary Equipment — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 904.9.4	Annually	Auxiliary Equipment. Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure such components are in proper operating condition.	PA 4072

A9. Total Flooding Systems — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 904.9.5	As Required	Total Flooding Systems. In any use of halon total flooding systems where there is a possibility that personnel will be trapped in, or enter into, an atmosphere made hazardous by a discharge, warning signs, discharge alarms and breathing apparatus, when provided, shall be maintained to ensure prompt evacuation of and to prevent entry into such atmospheres and also to provide means for prompt rescue of any trapped personnel.	PA 4072

HALON FIRE EXTINGUISHING SYSTEMS
GENERAL INFORMATION

PA 4070 / 12-20

Building ID:

System ID:

Date:

Original Installation Date:

General

Halon System Make/Model/Manufacturer:	
Control Panel Location/Make/Manufacturer:	
Halon Design Concentration:	
Describe Areas Protected – Include above suspended ceilings and/or below raised floors:	
Number of Halon Cylinders Installed: (main & reserve)	
Number of Halon Cylinders required for Discharge:	
Document Weights of all Cylinders with Halon Agent:	
Halon Agent Pressure:	

System Initiation

Number and Type of Fire Detection Devices:	
Location of Manual Release Station:	
Sequence of Operation: (provide additional documentation if needed)	

Notes:

THE PORT AUTHORITY OF NY & NJ

HALON FIRE EXTINGUISHING SYSTEMS
INSPECTION / TESTING / MAINTENANCE

PA 4071 / 12-20

Building ID: **System ID:**

- Use this form to document inspection/testing/maintenance of Halon fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Halon Systems – Inspection – Monthly – {Reference C8A3}** – At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order.

2. **Halon Systems – Inspection/Testing/Maintenance – SemiAnnually – {Reference C8A3} –** Systems shall be inspected, tested, serviced and otherwise maintained in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Systems shall be thoroughly inspected, tested, and documented for proper operation by trained competent personnel. Inspection criteria should include but is not limited to the following:

1. Detection. All detectors are to be checked for proper alarm, supervision, and trouble functions.	2. Actuation. (a) Remove automatic actuation controls from agent containers. Test detection system to operate the necessary circuit(s) to simulate agent release. (b) Operate all manual devices to simulate agent release. (c) After testing, reset and reinstall all actuation controls.
3. Containers. (a) Examine all containers for evidence of corrosion or mechanical damage. (b) Check container bracketing and supports to determine that their condition is satisfactory.	4. Piping and Nozzles. (a) Examine piping for any evidence of corrosion. (b) Examine pipe hangers and straps to see that the piping is securely supported. (c) Check nozzles for proper position and alignment and determine that the orifices are clear and unobstructed. (d) Check nozzle seals, if applicable, for signs of deterioration and replace if necessary.
5. Auxiliary Equipment. (a) Operate all auxiliary and supplementary components such as switches, door and window releases, interconnected valves, damper releases, air-handling equipment shutdown, and supplementary alarms to ensure that they are in proper operating condition. (b) Return all devices to normal "operating" condition after testing.	

3. **Halon Systems – Inspection/Testing/Maintenance – Annually – {Reference C8A3} –** Systems shall be inspected and tested for proper operation at 12-month intervals.

4. **Containers – Inspection – SemiAnnually – {Reference C8A3, C8A4}** – The extinguishing agent quantity and pressure of containers shall be checked at least on a semiannual basis. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure (adjusted for temperature) of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container. Factory-charged nonrefillable containers that do not have a means of pressure indication shall be weighed at least semiannually.

5. **Containers – Inspection – 5 Years – {Reference C8A4} –** Cylinders continuously in service without discharging shall be given a complete external visual inspection every 5 years, in accordance with Compressed Gas Association Pamphlet C-6, Section 3, except that the cylinders need not be emptied or stamped while under pressure.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

HALON FIRE EXTINGUISHING SYSTEMS
HOSE / ROOM ENCLOSURE / AUXILIARY EQUIPMENT

PA 4072 / 12-20

Building ID: **System ID:**

- Use this form to document inspection/testing/maintenance of Halon fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Hose – Inspection – Annually – {Reference C8A5}** – System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At five-year intervals, all hoses shall be tested.

2. **Hose – Testing – 5 Years – {Reference C8A6} –** All hoses shall be tested every 5 years. For Halon 1301 systems, hoses shall be tested at not less than 1,500 psi (10 343 kPa) for 600 psi (4137 kPa) charging pressure systems and not less than 900 psi (6206 kPa) for 360 psi (2482 kPa) charging pressure systems. For Halon 1211 hand-hose line systems, hoses shall be tested at 2,500 psi (17 238 kPa) for high-pressure systems and 900 psi (6206 kPa) for low-pressure systems.

3. **Room Enclosure – Inspection – SemiAnnually – {Reference C8A7}** – At least every 6 months the halon protected enclosure shall be thoroughly inspected to determine if penetrations or other changes have occurred that could adversely affect halon leakage. Where the inspection indicates that conditions exist that could result in inability to maintain the halon concentration, they shall be corrected. If uncertainty still exists, the enclosures shall be retested for integrity.

4. **Auxiliary Equipment – Testing – Annually – {Reference C8A8} –** Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure such components are in proper operating condition.

5. **Total Flooding Systems – Maintenance – As Required – {Reference C8A9} –** In any use of halon total flooding systems where there is a possibility that personnel will be trapped in, or enter into, an atmosphere made hazardous by a discharge, warning signs, discharge alarms and breathing apparatus, when provided, shall be maintained to ensure prompt evacuation of and to prevent entry into such atmospheres and also to provide means for prompt rescue of any trapped personnel.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

CHAPTER 9 – DRY CHEMICAL, WET CHEMICAL, AND COMMERCIAL KITCHEN FIRE EXTINGUISHING SYSTEMS

General Requirements for Dry Chemical Systems (applicable at all facilities)

FCNYS 2020 904.6	Dry-Chemical Systems. Dry-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17 and their listing. Records of inspections and testing shall be maintained.
IFCNJ 2015 904.6.1	System Test. Systems shall be inspected and tested for proper operation at six-month intervals. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed, and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals indicated by the manufacturer.
NYCFC 2014 904.6.2	Fusible link maintenance. Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 904.6	Dry chemical systems. Dry chemical fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 17, as modified by FC Appendix B, and their listing.
NYCFC 2014 904.6.1	Maintenance. At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess that the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers shall be checked to verify that the system has not been discharged. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals specified by the manufacturer.

A. Dry Chemical Systems

A1. Existing Dry Chemical Systems General Information — Update — Form PA 4074

Frequency – Annually

Review General Information Form for all Dry Chemical Systems, update as required.

A2. New or Altered Dry Chemical Systems – General Information — Update — Form PA 4074

Frequency – As Required

Complete General Information Form for new Dry Chemical System or update General Information Form for Dry Chemical Systems that have been altered to include repairs and/or modifications to components.

A3. Dry Chemical Systems — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17 2017 11.2.1	Monthly	On a monthly basis, inspection shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual or the owner's manual.	PA 4075
NFPA 17 2017 11.2.1.1		As a minimum, inspection shall include verification of the following: (1) The extinguishing system is in its proper location. (2) The manual actuators are unobstructed. (3) The tamper indicators and seals are intact. (4) The maintenance tag or certificate is in place. (5) The system shows no physical damage or condition that might prevent operation. (6) The pressure gauge(s), if provided, is inspected physically or electrically to ensure it is in the operable range. (7) The nozzle blowoff caps, where provided, are intact and undamaged. (8) Neither the protected equipment nor the hazard has been replaced, modified, or relocated.	
NFPA 17 2017 11.2.2		If any deficiencies are found, appropriate corrective action shall be taken immediately.	
NFPA 17 2017 11.2.2.1		Where the corrective action involves maintenance, it shall be conducted by a service technician as outlined in 11.1.3.	
NFPA 17 2017 11.1.3*		A service technician who performs maintenance on an extinguishing system shall be trained and shall have passed a written or online test that is acceptable to the authority having jurisdiction.	
NFPA 17 2017 A.11.1.3		A reasonable program for qualification of service technicians is for an individual to pass a written or online examination. The test should contain a reasonable number of questions to challenge the individual's knowledge of the subject matter.	
NFPA 17 2017 11.2.3		Personnel making inspections shall keep records for those extinguishing systems that were found to require corrective actions.	
NFPA 17 2017 11.2.4	Monthly	At least monthly, the date the inspection is performed and the initials of the person performing the inspection shall be recorded. The records shall be retained until the next semiannual maintenance.	PA 4075

A4. Dry Chemical Systems — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17 2017 11.3.1.4*	SemiAnnually	All dry chemical systems shall be tested, which shall include the operation of the detection system, signals, and releasing devices, including manual stations and other associated equipment.	PA 4075
NFPA 17 2017 A.11.3.1.4		A discharge of the dry chemical should not be part of this test.	

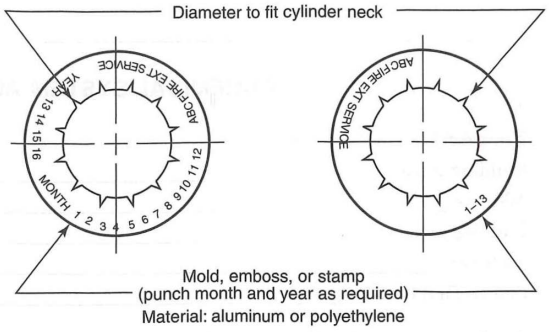
A5. Dry Chemical Systems — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17 2017 11.3.1*	SemiAnnually and after any System Activation	At least semiannually and after any system activation, maintenance shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual.	PA 4075
NFPA 17 2017 A.11.3.1		Regular service contracts are recommended.	

NFPA 17 2017 11.3.1.1		As a minimum, such maintenance shall include the following: (1) A check to see that the hazard has not changed. (2) An examination of all detectors, expellant gas container(s), agent container(s), releasing devices, piping, hose assemblies, nozzles, signals, and all auxiliary equipment. (3) *Verification that the agent distribution piping is not obstructed. (4) Examination of the dry chemical (If there is evidence of caking, the dry chemical shall be discarded and the system shall be recharged in accordance with the manufacturer's instructions.)	
NFPA 17 2017 A.11.3.1.1(3)		The following methods can be used for verifying that the piping is not obstructed: (1) Disassembly of all piping (2) Purging of piping with nitrogen or dry air (3) Utilizing methods recommended by the manufacturer	
NFPA 17 2017 11.3.1.3		Where maintenance of any dry chemical containers reveals conditions such as, but not limited to, corrosion or pitting in excess of the manufacturer's limits; structural damage; fire damage; or repairs by soldering, welding, or brazing, the affected container shall be replaced or hydrostatically tested in accordance with the recommendations of the manufacturer or the listing agency; hydrostatic testing of dry chemical containers shall be in accordance with Section 11.5.	
NFPA 17 2017 11.3.1.3.1		Where maintenance of any dry chemical system components reveals conditions such as, but not limited to, corrosion or pitting in excess of the manufacturer's limits, structural damage, or fire damage, the affected part(s) shall be replaced.	
NFPA 17 2017 11.3.1.5		Where the maintenance of the system(s) reveals defective parts that could cause an impairment or failure of proper operation of the system(s), the defective parts shall be replaced or repaired in accordance with the manufacturer's instructions.	
NFPA 17 2017 11.3.1.5.1		Until such repairs are accomplished, the system(s) shall be tagged as noncompliant, and the owner or owner's representative responsible for the system and the authority having jurisdiction shall be notified of the impairment.	
NFPA 17 2017 11.3.1.5.2		When all repairs have been accomplished and the system has been restored to its full operating condition, all previously notified parties shall be informed that the system is in its full operating condition.	
NFPA 17 2017 11.3.1.6*	Annually	Pressure regulators shall be operationally checked at least annually to ensure they meet the equipment manufacturer's recommended static outlet pressure and minimum flow rate tolerances.	PA 4075
NFPA 17 2017 A.11.3.1.6		Defective pressure regulators can impair performance and compromise the operational integrity of the system. Because field adjustments cannot correct internal diaphragm and seating problems, a defective regulator must be replaced with a new regulator or sent to a factory-authorized regulator rebuilding facility for repair, in accordance with 11.3.1.6.1.	
NFPA 17 2017 11.3.1.6.1		Defective regulator(s) shall not be adjusted but shall be replaced or sent to a factory-authorized regulator rebuilding facility for repair.	
NFPA 17 2017 11.3.1.7*	Annually	Auxiliary pressure cylinders that incorporate handoperable valves shall have their pressure checked at least annually with a device to verify the cylinder pressure meets the equipment manufacturer's tolerance specifications.	PA 4075
NFPA 17 2017 A.11.3.1.7		Pressure verification checks on auxiliary pressure cylinders not only ensure the functional operation of the pressure source discharge valve but also help verify that there is sufficient pressure to properly operate the system.	
NFPA 17 2017 11.3.1.8		The maintenance report, including any recommendations, shall be filed with the owner or with the owner's representative.	
NFPA 17 2017 11.3.1.8.1		The owner or owner's representative shall retain all maintenance reports for a period of 1 year after the next maintenance of that type required by this standard.	
NFPA 17 2017 11.3.1.9		The maintenance report, including any recommendations, shall be filed with the owner or with the designated party responsible for the system.	
NFPA 17 2017 11.3.1.10*		Each dry chemical system shall have a tag or label indicating the month and year the maintenance is performed and identifying the person performing the service; only the current tag or label shall remain in place.	
NFPA 17 2017 A.11.3.1.10	6 Years	Dry chemical in stored pressure systems shall not require semiannual examination but shall be examined at least every 6 years.	PA 4075

A6. Dry Chemical in Stored Pressure Systems — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17 2017 11.3.1.2	6 Years	Dry chemical in stored pressure systems shall not require semiannual examination but shall be examined at least every 6 years.	PA 4075
NFPA 17 2017 11.3.1.2.1*		Dry chemical containers that pass the applicable 6-year requirement of 11.3.1.2 shall have the maintenance information recorded on a durable weatherproof label that is a minimum size of 2 in. × 3 ½ in. (51 mm × 89 mm).	
NFPA 17 2017 A.11.3.1.2.1		In addition to the required tag or label, a permanent file record should be kept for each fire extinguisher. This file record should include the following information, as applicable: (1) Maintenance date and the name of the person and the agency performing the maintenance (2) Date of the last recharge and the name of the person and the agency performing the recharge (3) Hydrostatic retest date and the name of the person and the agency performing the hydrostatic test (4) Description of dents remaining after passing of the hydrostatic test (5) Date of the 6-year maintenance for stored-pressure dry chemical and halogenated agent types (See 7.3.6 of NFPA 10.) It is recognized that an electronic bar coding system is often acceptable to the authority having jurisdiction in lieu of a tag or label for maintenance record keeping. Under special circumstances, or when local requirements are in effect, additional information can be desirable or required [10: A.7.3.4]	
NFPA 17 2017 11.3.1.2.2		The new label shall be affixed to the container by a heatless process, and any old labels shall be removed.	
NFPA 17 2017 11.3.1.2.3		These labels shall be of the type that self-destructs when their removal from a dry chemical container is attempted.	
NFPA 17 2017 11.3.1.2.4		The label shall include the following information: (1) Month and year the maintenance was performed, indicated by a perforation such as done by a hand punch (2) Name or initials of the person performing the maintenance and the name of the agency performing the maintenance	
NFPA 17 2017 11.3.1.2.5*	As Required	Each system container that has undergone maintenance that includes internal examination or has been recharged shall have a verification-of-service collar located around the neck of the container.	PA 4075
NFPA 17 2017 A.11.3.1.2.5		A verification-of-service collar is installed to show that an extinguisher has been depressurized, the valve has been removed, and a complete maintenance has been performed. The verification-of-service collar design also requires that the valve be removed before the collar can be attached to the extinguisher. The collar provides the authorities having jurisdiction with a convenient visual proof that the extinguisher has been disassembled and that maintenance has been performed. All extinguishers are to have the valve removed for hydrostatic testing and are to be subsequently recharged before they are returned to service. To be valid, the date on the verification-of-service collar should always be the same as or more recent than the date on the hydrostatic test label. Figure A.11.3.1.2.5 provides a guide to the design of a verification-of-service collar. [10: A.7.10]	

NFPA 17 2017 Figure A.11.3.1.2.5		 FIGURE A.11.3.1.2.5 Design of a Verification-of-Service Collar. [10:Figure A.7.11]	
NFPA 17 2017 11.3.1.2.6		The collar shall not interfere with the operation of the system container discharge valve.	
NFPA 17 2017 11.3.1.2.7		The collar shall include the following information: (1) Month and year the service was performed, indicated by a perforation such as done by a hand punch (2) Name of the agency performing the maintenance or recharge	
NFPA 17 2017 11.3.1.2.8		Cartridge- or cylinder-operated dry chemical system containers shall not be required to comply with 11.3.1.2.1 through 11.3.1.2.7.	

A7. Fixed Temperature-Sensing Elements — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17 2017 11.3.2*	Annually	Fixed temperature-sensing elements of the fusible metal alloy type shall be replaced at least annually from the date of installation.	PA 4076
NFPA 17 2017 A.11.3.2		The date of manufacture marked on fusible metal alloy temperature-sensing elements does not limit when they can be used. The intent of 11.3.2 is to require replacement of fusible metal alloy sensing elements that have been installed for up to 1 year in environments subjecting them to contaminant loading, such as grease in restaurant hoods and ducts, that could adversely affect their proper operation.	
NFPA 17 2017 11.3.2.1		Upon removal of the fusible metal alloy temperature-sensing elements, the links shall be destroyed.	
NFPA 17 2017 11.3.2.2		The year of manufacture and the date of installation of the fixed temperature-sensing element shall be marked on the system inspection tag.	
NFPA 17 2017 11.3.2.3		The tag shall be signed or initialed by the installer.	
NFPA 17 2017 11.3.3*	SemiAnnually	Heat detectors other than metal alloy-type fusible links shall be permitted to remain continuously in service, provided they are inspected, cleaned, and tested, or replaced if necessary in accordance with NFPA 72, National Fire Alarm and Signaling Code, and the manufacturer's instructions at least semiannually or sooner depending on operating conditions.	PA 4076
NFPA 17 2017 A.11.3.3		Fixed temperature-sensing or rate-compensated thermal detection devices other than metal alloy–type fusible links that are installed on mobile equipment used off-road should have their set point and/or rate of compensation confirmed annually using devices specified or approved by the system manufacturer or should be replaced every 3 years. Fixed temperature-sensing or rate-compensated thermal detection devices other than metal alloy–type fusible links that are installed on mobile equipment used over the road should have their set point and/or rate of compensation confirmed annually using devices specified or approved by the system manufacturer or should be replaced every 6 years. Fixed temperature-sensing or rate-compensated thermal detection devices other than metal alloy–type fusible links that are installed on mobile equipment that have been involved in a fire incident, have been subjected to flame contact, or exhibit scorch marks or other signs of excessive temperature should be replaced.	

NFPA 17 2017 11.3.3.1		At a minimum, maintenance for restorable-type heat detectors shall include the following: (1) A visual inspection to determine that there is no damage to the detector or buildup of foreign debris. (2) An operational/functional test in accordance with the detector manufacturer's testing instructions. (3) A calibration verification test if applicable, in accordance with the detector manufacturer's instructions.	
NFPA 17 2017 11.3.3.2		Nonrestorable heat detectors shall be functionally tested in accordance with the manufacturer's instructions.	
NFPA 17 2017 11.3.3.3		Heat detectors and all associated wiring that show signs of fire damage shall be tested in accordance with the manufacturer's instructions and replaced if necessary.	

A8. Recharging — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17 2017 11.4.1	As required	All extinguishing systems shall be recharged after use or as indicated by an inspection or a maintenance check.	PA 4076
NFPA 17 2017 11.4.2		Systems shall be recharged in accordance with the manufacturer's design, installation, and maintenance manual.	

A9. Hydrostatic Testing — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17 2017 11.5		Hydrostatic Testing. Hydrostatic testing shall be performed by persons trained in pressure-testing procedures and safeguards and having available suitable testing equipment, facilities, and an appropriate service manual(s).	
NFPA 17 2017 11.5.1*	12 Years	The following parts of dry chemical extinguishing systems shall be subjected to a hydrostatic pressure test at intervals not exceeding 12 years: (1) Dry chemical containers (2) Auxiliary pressure containers (3) Hose assemblies Exception No. 1: Dry chemical containers that are part of extinguishing systems having an agent capacity exceeding 150 lb (68 kg). Exception No. 2: Auxiliary pressure containers not exceeding 2 in. (0.05 m) outside diameter and less than 2 ft (0.6 m) in length. Exception No. 3: Auxiliary pressure containers bearing the DOT "3E" marking.	PA 4076
NFPA 17 2017 A.11.5.1		Regarding the containers in Exception No. 3, DOT or TC-marked cylinders can be required to be subjected to more frequent testing.	
NFPA 17 2017 11.5.2		Dry chemical containers, auxiliary pressure containers, and hose assemblies shall be subjected to a hydrostatic test pressure equal to the marked factory test pressure or the test pressure specified in the manufacturer's design, installation, and maintenance manual.	
NFPA 17 2017 11.5.2.1		No leakage, rupture, or movement of hose couplings shall be permitted.	
NFPA 17 2017 11.5.2.2		The pressure in a hydrostatic test of a cylinder shall be maintained for a minimum of 30 seconds but for no less time than is required for complete expansion of the cylinder and to complete the visual examination of the cylinder.	
NFPA 17 2017 11.5.2.3*		Prior to being refilled or transported, in accordance with DOT or TC requirements, containers bearing DOT or TC markings shall be retested or replaced in accordance with the appropriate DOT or TC requirements.	
NFPA 17 2017 A.11.5.2.3		DOT- or TC-marked containers installed in a system that is not under the jurisdiction of DOT or TC are not required to follow DOT or TC requirements as long as they remain in operation.	
NFPA 17 2017 11.5.3		Dry chemical agent removed from the containers prior to hydrostatic testing shall be discarded.	
NFPA 17 2017 11.5.4		Care shall be taken to ensure that all tested equipment is thoroughly dried prior to reuse.	
NFPA 17 2017 11.5.5		To protect the hazard during hydrostatic testing, if there is no connected reserve, alternative protection acceptable to the authority having jurisdiction shall be provided.	

B. Wet Chemical Systems

General Requirements for Wet Chemical Systems (applicable at all facilities)

IFCNJ 2015 904.5.	Wet-Chemical Systems. Wet-chemical extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 17A and their listing. Records of inspections and testing shall be maintained.
FCNYS 2020 904.5.1	System Test. Systems shall be inspected and tested for proper operation at six-month intervals. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals indicated by the manufacturer.
NYCFC 2014 904.5.2	Fusible link maintenance. Fixed temperature- sensing elements shall be maintained to ensure proper operation of the system.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 904.5	Wet chemical systems. Wet chemical fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 17A, as modified by FC Appendix B, and their listing.
NYCFC 2014 904.5.1	Maintenance. At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers shall be weighed to verify the required amount of agent. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals specified by the manufacturer.
NYCFC 2014 904.5.3	Commercial cooking installations. Wet chemical fire extinguishing systems installed to protect a commercial cooking operation shall additionally comply with the requirements of FC904.11.

B1. Existing Wet Chemical Systems General Information — Update — Form PA 4080

Frequency – Annually

Review General Information Form for all Wet Chemical Systems, update as required.

B2. New or Altered Wet Chemical Systems – General Information — Update — Form PA 4080

Frequency – As Required

Complete General Information Form for new Wet Chemical System or update General Information Form for Wet Chemical Systems that have been altered to include repairs and/or modifications to components.

B3. Wet Chemical System — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17A 2017 7.2.1	Monthly	On a monthly basis, inspection shall be conducted in accordance with 7.2.2 and the owner's manual.	PA 4077
NFPA 17A 2017 7.2.1.1		The system owner shall maintain the design and installation documents and maintenance manual or owner's manual on the premises and shall make them available for review, upon request, by the authority having jurisdiction.	
NFPA 17A 2017 7.2.2		At a minimum, the inspection shall include verification of the following: (1) The extinguishing system is in its proper location. (2) The manual actuators are unobstructed. (3) The tamper indicators and seals are intact. (4) The maintenance tag or certificate is in place. (5) No obvious physical damage or condition exists that might prevent operation. (6) The pressure gauge(s), if provided, has been inspected physically or electronically to ensure it is in the operable range. (7) The nozzle blowoff caps, where provided, are intact and undamaged. (8) The hazard has not changed, including replacement, modification, and relocation of protected equipment.	
NFPA 17A 2017 7.2.3		If any deficiencies are found, appropriate corrective action shall be taken immediately.	
NFPA 17A 2017 7.2.3.1		Where the corrective action involves maintenance, it shall be conducted by a service technician as outlined in 7.3.1.	
NFPA 17A 2017 7.2.4		Personnel making inspections shall keep records for those extinguishing systems that were found to require corrective actions.	
NFPA 17A 2017 7.2.5	Monthly	At least monthly, the date the inspection is performed and the initials of the person performing the inspection shall be recorded.	PA 4077
NFPA 17A 2017 7.2.6		The records shall be retained for the period between the semiannual maintenance inspections.	

B4. Wet Chemical System — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17A 2017 7.3.3.4*	SemiAnnually	All wet chemical systems shall be tested, which shall include operation of the detection system signals and releasing devices, including manual stations and other associated equipment.	PA 4077
NFPA 17A 2017 A.7.3.3.4		A discharge of the wet chemical normally is not part of this test.	

B5. Wet Chemical System — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17A 2017 7.3.1*		A service technician who performs maintenance on an extinguishing system shall be trained and shall have passed a written or online test that is acceptable to the authority having jurisdiction.	
NFPA 17A 2017 A.7.3.1		A reasonable program for qualification of service technicians is for an individual to pass a written or online examination. The test should contain a reasonable number of questions to challenge the individual's knowledge of the subject matter.	
NFPA 17A 2017 7.3.1.1		The service technician shall possess a certification document confirming the requirements in 7.3.1 and issued by the manufacturer or testing organization that is acceptable to the authority having jurisdiction.	
NFPA 17A 2017 7.3.2*		A service technician who has the applicable manufacturer's design, installation, and maintenance manual and service bulletins shall service the wet chemical fire-extinguishing system at intervals of no more than 6 months as outlined in 7.3.3.	
NFPA 17A 2017 A.7.3.2		It is recommended that system maintenance personnel be certified as outlined in 7.3.1. It is standard industry practice to provide expiration dates on certificates.	
NFPA 17A 2017 7.3.3*	SemiAnnually	At least semiannually and after any system activation, maintenance shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual.	PA 4077
NFPA 17A 2017 A.7.3.3		Regular service contracts are recommended.	

NFPA 17A 2017 7.3.3.1		Maintenance shall include the following: (1) A check to see that the hazard has not changed. (2) An examination of all detectors, the expellant gas container(s), the agent container(s), releasing devices, piping, hose assemblies, nozzles, signals, all auxiliary equipment and the liquid level of all nonpressurized wet chemical containers. (3) *Verification that the agent distribution piping is not obstructed	
NFPA 17A 2017 A.7.3.3.1(3)		The following methods can be used to verify that piping is not obstructed: (1) Disassembly of all piping (2) Conducting a full or partial discharge test (3) Utilizing other methods recommended by the manufacturer	
NFPA 17A 2017 7.3.2.2*		Where maintenance of any wet chemical containers reveals conditions such as, but not limited to, corrosion or pitting in excess of the manufacturer's limits; structural damage; fire damage; or repairs by soldering, welding, or brazing, the affected container shall be hydrostatically tested in accordance with Section 7.5 or replaced in accordance with the instructions of the manufacturer or the listing agency.	
NFPA 17A 2017 A.7.3.3.2		The hydrostatic testing of wet chemical containers should follow the applicable procedures outlined in Section 7.5.	
NFPA 17A 2017 7.3.3.3		Where maintenance of any wet chemical system components reveals corrosion or pitting in excess of the manufacturer's limits, structural damage, or fire damage, the affected part(s) shall be replaced.	
NFPA 17A 2017 7.3.3.5		Parts that are found during maintenance that could cause an impairment or failure of operation of the system shall be replaced by listed components as required by Section 4.1in accordance with the manufacturer's instructions.	
NFPA 17A 2017 7.3.3.5.1		Until such repairs are accomplished, the systems shall be tagged as impaired, and the owner or owner's representative responsible for the system and, where required, the authority having jurisdiction shall be notified of the impairment.	
NFPA 17A 2017 7.3.3.5.2		When all repairs have been accomplished and the system has been restored to full operating conditions, all previously notified parties shall be informed that the system is in the full operating condition.	
NFPA 17A 2017 7.3.3.6		The maintenance report, including any recommendations, shall be filed with the owner or with the owner's representative.	
NFPA 17A 2017 7.3.3.6.1		The owner or owner's representative shall retain all maintenance reports for a period of 1 year after the next maintenance of that type required by the standard.	
NFPA 17A 2017 7.3.3.7*		Each wet chemical system shall have a tag or label securely attached, indicating the month and year the maintenance is performed and identifying the person performing the service. Only the current tag or label shall remain in place.	

B6. Fixed Temperature-Sensing Elements — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17A 2017 7.3.4*	SemiAnnually	Fixed temperature-sensing elements of the fusible metal alloy type shall be replaced at least semiannually from the date of installation or more frequently, if necessary, and shall be destroyed when removed.	PA 4078
NFPA 17A 2017 7.3.4.1*		Replacement fixed temperature-sensing elements shall be listed and shall be the same temperature ratings as the ones being replaced unless temperature readings dictate a need for a change.	
NFPA 17A 2017 A.7.3.4.1		Wet chemical solutions normally have no lasting significant effects on the skin, respiratory system, or clothing. They can produce mild, temporary skin irritation after prolonged skin exposure, but symptoms usually disappear when contact is eliminated. Irritation of the eyes should be treated by flushing with tap water for 15 minutes or longer. Any condition of prolonged irritation should be referred to a physician for treatment. Treatment of skin irritation due to exposure to wet chemical is best handled by flushing with water. These systems are investigated to determine that they do not splash burning grease when installed in accordance with the manufacturer's design, installation, and maintenance manual. It is known that potassium carbonate is moderately irritating to the skin and eyes and that repeated skin contact can lead to dermatitis, but this is based on concentrations higher than those used in wet chemical extinguishing system units.	

NFPA 17A 2017 7.3.4.2		The year of manufacture and the date of installation of the fixed temperature-sensing element shall be marked on the system inspection tag, and the tag shall be signed or initialed by the installer.	
NFPA 17A 2017 7.3.5	Annually	Fixed temperature-sensing elements other than the fusible metal alloy type shall be permitted to remain continuously in service, provided they are inspected and cleaned or replaced, if necessary, in accordance with the manufacturer's instructions, every 12 months or more frequently to ensure proper operation of the system.	PA 4078
NFPA 17A 2017 7.3.5.1		At a minimum, maintenance of restorable-type heat detectors shall include the following: (1) A visual inspection to determine whether there is damage to the detector or buildup of foreign debris (2) An operational/functional test in accordance with the detector manufacturer's testing instructions (3) A calibration verification test, if applicable, in accordance with the detector manufacturer's instructions	
NFPA 17A 2017 7.3.5.2		Nonrestorable heat detectors shall be functionally tested in accordance with the manufacturer's instructions.	
NFPA 17A 2017 7.3.5.3		Heat detectors and all associated wiring that show signs of fire damage shall be tested in accordance with the manufacturer's instructions and replaced if necessary.	

B7. Recharging Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17A 2017 7.4.1*	After Any Discharge or Insufficient Charge	After any discharge or if insufficient charge is noted during an inspection or maintenance procedure, the following procedures shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual: (1) The system shall be recharged. (2) The system shall be placed in the normal operating condition. (3) Following a discharge, the piping shall be flushed and blown out with dry air or nitrogen in accordance with the manufacturer's design, installation, and maintenance manual.	PA 4078
NFPA 17A 2017 A.7.4.1		Wet chemical solutions normally have no lasting significant effects on the skin, respiratory system, or clothing. They can produce mild, temporary skin irritation after prolonged skin exposure, but symptoms usually disappear when contact is eliminated. Irritation of the eyes should be treated by flushing with tap water for 15 minutes or longer. Any condition of prolonged irritation should be referred to a physician for treatment.	
NFPA 17A 2017 7.4.2		Systems shall be recharged in accordance with the manufacturer's design, installation, and maintenance manual.	
NFPA 17A 2017 7.4.3		After any discharge, the system piping shall be flushed and blown out with dry air or nitrogen in accordance with the procedures detailed in the manufacturer's design, installation, and maintenance manual.	
NFPA 17A 2017 7.4.4*		Storage. Recharging supplies of wet chemical shall be stored in the original closed shipping container supplied by the manufacturer.	
NFPA 17A 2017 A.7.4.4		The characteristics of the system are dependent on the composition of the wet chemical solution and the type of expellant gas, as well as other factors; therefore, it is imperative to use the wet chemical provided by the manufacturer of the system and the type of expellant gas specified by the manufacturer of the system. Systems are designed on the basis of the flow and extinguishing characteristics of a specific formulation of wet chemical. Storage of wet chemical solution in containers other than those supplied by the manufacturer can result in agent contamination or deterioration and confusion regarding its identity.	
NFPA 17A 2017 7.4.4.1		These containers shall not be opened until the system is recharged.	
NFPA 17A 2017 7.4.4.2		Wet chemical supplies shall be maintained within the manufacturer's specified storage temperature range.	

B8. Hydrostatic Testing — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17A 2017 A.7.5		DOT- or TC-marked cylinders can be required to be subjected to more frequent testing.	
NFPA 17A 2017 7.5.1	12 Years	The following parts of wet chemical extinguishing systems shall be subjected to a hydrostatic pressure test at intervals not exceeding 12 years: 1) Wet chemical containers 2) Auxiliary pressure containers 3) Hose assemblies Exception No. 1: Auxiliary pressure containers not exceeding 2 in. (0.05 m) outside diameter and less than 2 ft (0.6 m) in length. Exception No. 2: Auxiliary pressure containers bearing the DOT "3E" marking.	PA 4078
NFPA 17A 2017 7.5.2		Wet chemical containers, auxiliary pressure containers, and hose assemblies shall be subjected to a hydrostatic test pressure equal to the marked factory test pressure or the test pressure specified in the manufacturer's design, installation, and maintenance manual.	
NFPA 17A 2017 7.5.2.1		No leakage, rupture, or movement of hose couplings shall be permitted.	
NFPA 17A 2017 7.5.2.2		The pressure in a hydrostatic test of a cylinder shall be maintained for a minimum of 30 seconds, but for no less time than is required for complete expansion of the cylinder and to complete the visual examination of the cylinder.	
NFPA 17A 2017 7.5.2.3*		Prior to being refilled or transported, in accordance with DOT or TC requirements, containers bearing DOT or TC markings shall be retested or replaced in accordance with the appropriate DOT or TC requirements.	
NFPA 17A 2017 A.7.5.2.3		DOT- or TC-marked containers installed in a system not under the jurisdiction of DOT or TC are not required to follow DOT or TC requirements as long as they remain in operation.	
NFPA 17A 2017 7.5.3		Wet chemical agent removed from the containers prior to hydrostatic testing shall be discarded.	
NFPA 17A 2017 7.5.4		To protect the hazard during hydrostatic testing, if there is no connected reserve, alternative protection acceptable to the authority having jurisdiction shall be provided.	

B9. Service Collar — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 17A 2017 7.6.1	As Required	Each system container that has undergone maintenance that includes internal examination or has been recharged shall have a verification-of-service collar located around the neck of the container. [17:11.3.1.2.5]	PA 4077
NFPA 17A 2017 7.6.2		The collar shall not interfere with the operation of the system container discharge valve. [17:11.3.1.2.6]	
NFPA 17A 2017 7.6.3		The collar shall include the following information: (1) Month and year the service was performed, indicated by a perforation such as done by a hand punch (2) Name of the agency performing the maintenance or recharge [17:11.3.1.2.7]	
NFPA 17A 2017 7.6.4		Cartridge- or cylinder-operated wet chemical system containers shall not be required to comply with 7.6.1 through 7.6.3. [17:11.3.1.2.8]	
NFPA 17A 2017 7.6.5		The collar shall be a single circular piece of uninterrupted material forming a hole of a size that does not permit the collar assembly to move over the neck of the container unless the valve is completely removed.	

C. Commercial Kitchen Fire Extinguishing Systems

In addition to A or B above, the following requirements are provided.

C1. Commercial Cooking Systems Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 904.12.	NJ NYS	The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry- and wet-chemical extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Other types of automatic fire-extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, NFPA 96, its listing and the manufacturer's installation instructions. Automatic fire-extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows: 1. Carbon dioxide extinguishing systems, NFPA 12. 2. Automatic sprinkler systems, NFPA 13. 3. Automatic water mist systems, NFPA 750. (NYS Only) 4. Foam-water sprinkler system or foam-water spray systems, NFPA 16. 5. Dry-chemical extinguishing systems, NFPA 17. 6. Wet-chemical extinguishing systems, NFPA 17A. Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and listed, labeled and installed in accordance with Section 304.1 of the Mechanical Code of New York State.	
NYCFC 2014 904.11.	NYC	The fire extinguishing system for commercial cooking systems shall be designed and installed, and periodically inspected, tested and otherwise maintained in accordance with the construction codes, including the Building Code, FC 901, 904.1.1 and 904.4, and this section. The fire extinguishing system for commercial cooking systems shall be of an approved type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered wet chemical fire extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Dry chemical fire extinguishing systems shall not be installed to protect commercial cooking equipment and exhaust systems. Other types of fire extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, its listing and the manufacturer’s installation instructions. Fire extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows: 1. Carbon dioxide fire extinguishing systems, NFPA 12, as modified by FC Appendix B. 2. Foam-water sprinkler system or foam-water spray systems, NFPA 16, as modified by FC Appendix B. 3. Wet chemical fire extinguishing systems, NFPA 17A, as modified by FC Appendix B.	
IFCNJ 2015 904.12.1	NJ NYS	Manual System Operation A manual actuation device shall be located at or near a means of egress from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system. Exception: Automatic sprinkler systems shall not be required to be equipped with manual actuation means.	
NYCFC 2014 904.11.1	NYC	Manual system operation. A manual activation device shall be located at or near a means of egress from the cooking area and a minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual activation device shall be located a minimum of 42 inches (1067	

		mm) and a maximum of 48 inches (1219 mm) above the floor at its center. The manual activation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to activate the fire extinguishing system. A sign or marking on or adjacent to the manual activation device shall clearly identify the commercial cooking equipment being protected. Exception: Sprinkler systems shall not be required to be equipped with a manual activation device.	
IFCNJ 2015 904.12.2		System Interconnection The actuation of the fire extinguishing system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.	
FCNYS 2020 904.12.3	NYS	Carbon Dioxide Systems Where carbon dioxide systems are used, there shall be a nozzle at the top of the ventilating duct. Additional nozzles that are symmetrically arranged to give uniform distribution shall be installed within vertical ducts exceeding 20 feet (6096 mm) and horizontal ducts exceeding 50 feet (15 240 mm). Dampers shall be installed at either the top or the bottom of the duct and shall be arranged to operate automatically upon activation of the fire-extinguishing system. Where the damper is installed at the top of the duct, the top nozzle shall be immediately below the damper. Automatic carbon dioxide fire-extinguishing systems shall be sufficiently sized to protect all hazards venting through a common duct simultaneously.	
IFCNJ 2015 904.12.3.1	NJ NYS	Ventilation System Commercial-type cooking equipment protected by an automatic carbon dioxide extinguishing system shall be arranged to shut off the ventilation system upon activation.	
FCNYS 2020 904.12.4		Special Provisions for Automatic Sprinkler Systems Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, indicating-type control valve that is identified. Access to the control valve shall be provided.	
IFCNJ 2015 904.12.4.1		Listed Sprinklers Sprinklers used for the protection of fryers shall be tested in accordance with UL 199E, listed for that application and installed in accordance with their listing.	
IFCNJ 2015 904.12.5	NJ	Portable Fire Extinguishers for Commercial Cooking Equipment Portable fire extinguishers shall be provided within a 30-foot (9144 mm) distance of travel from commercial-type cooking equipment. Cooking equipment involving solid fuels or vegetable or animal oils and fats shall be protected by a Class K rated portable extinguisher in accordance with Section 904.12.5.1 or 904.12.5.2, as applicable.	
IFCNJ 2015 904.12.5.1	NJ	Portable Fire Extinguishers for Solid Fuel Cooking Appliances Solid fuel cooking appliances, whether or not under a hood, with fireboxes 5 cubic feet (0.14 m3) or less in volume shall have a minimum 2.5-gallon (9 L) or two 1.5-gallon (6 L) Class K wet-chemical portable fire extinguishers located in accordance with Section 904.12.5.	
IFCNJ 2015 904.12.5.2	NJ	Class K Portable Fire Extinguishers for Deep Fat Fryers Where hazard areas include deep fat fryers, listed Class K portable fire extinguishers shall be provided as follows: • For up to four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity. • For every additional group of four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one additional Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity shall be provided. • For individual fryers exceeding 6 square feet (0.55 m2) in surface area: Class K portable fire extinguishers shall be installed in accordance with the extinguisher manufacturer's recommendations.	
NYCFC 2014 904.11.5	NYC SemiAnnually	Staff training. At least once every 6 months the owner or operator of the premises shall review with all kitchen staff the manual operation of the fire extinguishing system.	PA 4079
NYCFC 2014 904.11.6	NYC Monthly	Maintenance. At least once a month, an inspection shall be conducted by a trained and knowledgeable person	PA 4079

	SemiAnnually	to assess that the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. At a minimum, the semiannual inspection, testing and servicing shall include: (1) Verification that the hazard has not changed. (2) Verification that the fire extinguishing system has not been altered. (3) Examination of all detectors, agent and gas containers, releasing devices, piping, hose assemblies, nozzles, and all auxiliary equipment. (4) Verification that the agent distribution piping is not obstructed. (5) Verification that the extinguishing agent container and/or auxiliary pressure containers have been, as applicable, inspected, retested and marked in conformance with the requirements of the United States Department of Transportation. (6) A test of the system's automatic and manual releasing devices, including any associated equipment. (7) A test of the gas and electric power source shutoff devices. (8) Preparation and submission to the owner of a written report of any system defects. (9) Upon satisfactory completion of the semiannual inspection and correction of all defects, providing the owner with an inspection, testing and service compliance tag. Such tag shall indicate the date issued, the name and license number of the licensed master fire suppression piping contractor issuing the tag, and that the system was found to be in compliance with the requirements of this section.	
IFCNJ 2015 904.12.6		Operations and Maintenance Automatic fire-extinguishing systems protecting commercial cooking systems including mobile enclosed cooking operations shall be maintained in accordance with Sections 904.12.6.1 through 904.12.6.3.	
FCNYS 2020 904.12.5.1	NJ NYS	Existing Automatic Fire-Extinguishing Systems Where changes in the cooking media, positioning of cooking equipment or replacement of cooking equipment occur in existing commercial cooking systems, the automatic fire-extinguishing system shall be required to comply with the applicable provisions of Sections 904.12 through 904.12.4.	
IFCNJ 2015 904.12.6.2	NJ NYS SemiAnnually	Extinguishing System Service Automatic fire-extinguishing systems shall be serviced at least every six months and after activation of the system. Inspection shall be by qualified individuals, and a certificate of inspection shall be forwarded to the fire code official upon completion.	PA 4079
NYCFC 2014 904.11.6.1	Annually	Fusible link and sprinkler head replacement. Fusible links and sprinkler heads (foam water or automatic) shall be replaced at least annually, and other protection devices shall be serviced or replaced in accordance with the manufacturer's instructions. Exception: Frangible bulbs are not required to be replaced annually.	PA 4079
NYCFC 2014 904.11.6.2	NYC	Recordkeeping. Records shall be maintained as set forth in FC901.6.2. Upon satisfactory completion of each semiannual inspection required by FC904.11.6, and the correction of all system defects, the master fire suppression piping contractor licensed by the Department of Buildings shall issue and post in a conspicuous location in the cooking area an inspection, testing and servicing compliance tag. A new compliance tag shall be issued and posted for each required semiannual inspection.	
NYCFC 2014 904.11.6.3	NYC	Signage. Instructions for manual operation of the fire extinguishing system, including a statement that the fire extinguishing system shall be manually activated prior to using a portable fire extinguisher, shall be posted, under glass or laminated, near the system's manual activation device. Information shall be clearly and concisely written, and the posting shall be at least 8½ inches (216 mm) by 11 inches (279 mm) in size.	

DRY AND WET CHEMICAL FIRE EXTINGUISHING SYSTEMS
PA 4074 / 12-20

GENERAL INFORMATION – FIXED DRY CHEMICAL SYSTEMS

Building ID: **System ID:**

Date: **Original Installation Date:**

General

Manufacturer:	
Service Contractor:	
Extinguishing agent:	
Connected to base building fire alarm system?	
Location of manual release station:	
Equipment Protected – Provide details on the equipment protected by this system and the sequence of operation. Attach additional documentation if needed.	

Dry Chemical Cylinder

Normal Pressure	psi
Manufacturer's Minimum Pressure	psi
Normal Weight:	lbs
Manufacturer's Minimum Weight	lbs

Expellant Gas Cartridge

Normal Weight (if carbon dioxide)	lbs (kg)
Normal Pressure (if nitrogen)	psi (bar)

Notes:

THE PORT AUTHORITY OF NY & NJ

DRY CHEMICAL FIRE EXTINGUISHING SYSTEMS
INSPECTION / TESTING / MAINTENANCE

PA 4075 / 12-20

Building ID: **System ID:**

- Use this form to document inspection/testing/maintenance of dry chemical fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Dry Chemical Systems – Inspection – Monthly – {Reference C9A3} –** On a monthly basis, inspection shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual or the owner's manual. As a minimum, inspection shall include verification of the following:
   (1) The extinguishing system is in its proper location.
   (2) The manual actuators are unobstructed.
   (3) The tamper indicators and seals are intact.
   (4) The maintenance tag or certificate is in place.
   (5) The system shows no physical damage or condition that might prevent operation.
   (6) The pressure gauge(s), if provided, is inspected physically or electrically to ensure it is in the operable range.
   (7) The nozzle blowoff caps, where provided, are intact and undamaged.
   (8) Neither the protected equipment nor the hazard has been replaced, modified, or relocated.

2. **Dry Chemical Systems – Testing – SemiAnnually – {Reference C9A4} –** All dry chemical systems shall be tested, which shall include the operation of the detection system, signals, and releasing devices, including manual stations and other associated equipment.

3. **Dry Chemical Systems – Maintenance – SemiAnnually – {Reference C9A5} –** At least semiannually and after any system activation, maintenance shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual. As a minimum, such maintenance shall include the following:
   (1) A check to see that the hazard has not changed.
   (2) An examination of all detectors, expellant gas container(s), agent container(s), releasing devices, piping, hose assemblies, nozzles, signals, and all auxiliary equipment.
   (3) *Verification that the agent distribution piping is not obstructed.
   (4) Examination of the dry chemical (If there is evidence of caking, the dry chemical shall be discarded and the system shall be recharged in accordance with the manufacturer's instructions.)

4. **Dry Chemical Systems – Maintenance – Annually – {Reference C9A5}**
   - Pressure regulators shall be operationally checked at least annually to ensure they meet the equipment manufacturer's recommended static outlet pressure and minimum flow rate tolerances.
   - Auxiliary pressure cylinders that incorporate hand-operable valves shall have their pressure checked at least annually with a device to verify the cylinder pressure meets the equipment manufacturer's tolerance specifications.

5. **Dry Chemical in Stored Pressure Systems – Maintenance – 6 Years – {Reference C9A6} -** Dry chemical in stored pressure systems shall not require semiannual examination but shall be examined at least every 6 years.

6. **Service Collar – Maintenance – As Required – {Reference C9A6} –** Each system container that has undergone maintenance that includes internal examination or has been recharged shall have a verification-of-service collar located around the neck of the container.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

DRY CHEMICAL FIRE EXTINGUISHING SYSTEMS

PA 4076 / 12-20

FIXED TEMPERATURE-SENSING ELEMENTS
RECHARGING / HYDROSTATIC TESTING

Building ID: **System ID:**

- Use this form to document testing/maintenance of dry chemical fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fixed Temperature-Sensing Elements – Maintenance – Annually – {Reference C9A7}** – Fixed temperature-sensing elements of the fusible metal alloy type shall be replaced at least annually from the date of installation. Upon removal of the fusible metal alloy temperature-sensing elements, the links shall be destroyed.

2. **Fixed Temperature-Sensing Elements – Maintenance – SemiAnnually – {Reference C9A7}** – Heat detectors other than metal alloy-type fusible links shall be permitted to remain continuously in service, provided they are inspected, cleaned, and tested, or replaced if necessary in accordance with NFPA 72, National Fire Alarm and Signaling Code, and the manufacturer's instructions at least semiannually or sooner depending on operating conditions.
   - At a minimum, maintenance for restorable-type heat detectors shall include the following:
     (1) A visual inspection to determine that there is no damage to the detector or buildup of foreign debris.
     (2) An operational/functional test in accordance with the detector manufacturer's testing instructions.
     (3) A calibration verification test if applicable, in accordance with the detector manufacturer's instructions.
   - Nonrestorable heat detectors shall be functionally tested in accordance with the manufacturer's instructions.

3. **Recharging – Maintenance – As Required – {Reference C9A8}** – All extinguishing systems shall be recharged after use or as indicated by an inspection or a maintenance check. Systems shall be recharged in accordance with the manufacturer's design, installation, and maintenance manual.

4. **Hydrostatic Testing – Testing – 12 Years – {Reference C9A9}** – The following parts of dry chemical extinguishing systems shall be subjected to a hydrostatic pressure test at intervals not exceeding 12 years:
   (1) Dry chemical containers
   (2) Auxiliary pressure containers
   (3) Hose assemblies
   Exception No. 1: Dry chemical containers that are part of extinguishing systems having an agent capacity exceeding 150 lb (68 kg).
   Exception No. 2: Auxiliary pressure containers not exceeding 2 in. (0.05 m) outside diameter and less than 2 ft (0.6 m) in length.
   Exception No. 3: Auxiliary pressure containers bearing the DOT "3E" marking.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

THE PORT AUTHORITY OF NY & NJ

WET CHEMICAL FIRE EXTINGUISHING SYSTEMS
INSPECTION / TESTING / MAINTENANCE

PA 4077 / 12-20

Building ID: **System ID:**

- Use this form to document inspection/testing/maintenance of wet chemical fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Wet Chemical Systems – Inspection – Monthly – {Reference C9B3} –** On a monthly basis, inspection shall be conducted in accordance with 7.2.2 and the owner's manual. At a minimum, the inspection shall include verification of the following:
   (1) The extinguishing system is in its proper location.
   (2) The manual actuators are unobstructed.
   (3) The tamper indicators and seals are intact.
   (4) The maintenance tag or certificate is in place.
   (5) No obvious physical damage or condition exists that might prevent operation.
   (6) The pressure gauge(s), if provided, has been inspected physically or electronically to ensure it is in the operable range.
   (7) The nozzle blowoff caps, where provided, are intact and undamaged.
   (8) The hazard has not changed, including replacement, modification, and relocation of protected equipment.

2. **Wet Chemical Systems – Testing – SemiAnnually – {Reference C9B4} –** All wet chemical systems shall be tested, which shall include operation of the detection system signals and releasing devices, including manual stations and other associated equipment.

3. **Wet Chemical Systems – Maintenance – SemiAnnually – {Reference C9B5} –** At least semiannually and after any system activation, maintenance shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual. Maintenance shall include the following:
   (1) A check to see that the hazard has not changed.
   (2) An examination of all detectors, the expellant gas container(s), the agent container(s), releasing devices, piping, hose assemblies, nozzles, signals, all auxiliary equipment and the liquid level of all nonpressurized wet chemical containers.
   (3) *Verification that the agent distribution piping is not obstructed

4. **Service Collar – Maintenance – As Required – {Reference C9B9} –** Each system container that has undergone maintenance that includes internal examination or has been recharged shall have a verification-of-service collar located around the neck of the container.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

WET CHEMICAL FIRE EXTINGUISHING SYSTEMS
FIXED TEMPERATURE-SENSING ELEMENTS
RECHARGING / HYDROSTATIC TESTING

PA 4078 / 12-20

Building ID: **System ID:**

- Use this form to document testing/maintenance of wet chemical fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fixed Temperature-Sensing Elements – Maintenance – SemiAnnually – {Reference C9B6} –** Fixed temperature-sensing elements of the fusible metal alloy type shall be replaced at least semiannually from the date of installation or more frequently, if necessary, and shall be destroyed when removed.

2. **Fixed Temperature-Sensing Elements – Maintenance – Annually – {Reference C9B6} –** Fixed temperature-sensing elements other than the fusible metal alloy type shall be permitted to remain continuously in service, provided they are inspected and cleaned or replaced, if necessary, in accordance with the manufacturer's instructions, every 12 months or more frequently to ensure proper operation of the system.
   - At a minimum, maintenance of restorable-type heat detectors shall include the following:
     (1) A visual inspection to determine whether there is damage to the detector or buildup of foreign debris
     (2) An operational/functional test in accordance with the detector manufacturer's testing instructions
     (3) A calibration verification test, if applicable, in accordance with the detector manufacturer's instructions
   - Nonrestorable heat detectors shall be functionally tested in accordance with the manufacturer's instructions.

3. **Recharging – Maintenance – After Any Discharge or Insufficient Charge – {Reference C9B7} –** After any discharge or if insufficient charge is noted during an inspection or maintenance procedure, the following procedures shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual:
   (1) The system shall be recharged.
   (2) The system shall be placed in the normal operating condition.
   (3) Following a discharge, the piping shall be flushed and blown out with dry air or nitrogen in accordance with the manufacturer's design, installation, and maintenance manual.

4. **Hydrostatic Testing – Testing – 12 Years – {Reference C9B8}** – The following parts of wet chemical extinguishing systems shall be subjected to a hydrostatic pressure test at intervals not exceeding 12 years:
   (1) Wet chemical containers
   (2) Auxiliary pressure containers
   (3) Hose assemblies
   Exception No. 1: Auxiliary pressure containers not exceeding 2 in. (0.05 m) outside diameter and less than 2 ft (0.6 m) in length.
   Exception No. 2: Auxiliary pressure containers bearing the DOT "3E" marking.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

THE PORT AUTHORITY OF NY & NJ

COMMERCIAL KITCHEN FIRE EXTINGUISHING SYSTEMS
INSPECTION / TESTING / MAINTENANCE

PA 4079 / 12-20

Building ID: **System ID:**

- Use this form to document inspection/testing/maintenance of commercial kitchen fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Staff training – Maintenance – SemiAnnually – {Reference C9C1} –** At least once every 6 months the owner or operator of the premises shall review with all kitchen staff the manual operation of the fire extinguishing system.

2. **Commercial Cooking Systems – Inspection – Monthly – {Reference C9C1} –** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess that the system is in good working order.

3. **Commercial Cooking Systems – Inspection/Testing/Maintenance – SemiAnnually – {Reference C9C1} –** Systems shall be inspected, tested, serviced and otherwise maintained in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. At a minimum, the semiannual inspection, testing and servicing shall include:
   (1) Verification that the hazard has not changed.
   (2) Verification that the fire extinguishing system has not been altered.
   (3) Examination of all detectors, agent and gas containers, releasing devices, piping, hose assemblies, nozzles, and all auxiliary equipment.
   (4) Verification that the agent distribution piping is not obstructed.
   (5) Verification that the extinguishing agent container and/or auxiliary pressure containers have been, as applicable, inspected, retested and marked in conformance with the requirements of the United States Department of Transportation.
   (6) A test of the system's automatic and manual releasing devices, including any associated equipment.
   (7) A test of the gas and electric power source shutoff devices.
   (8) Preparation and submission to the owner of a written report of any system defects.
   (9) Upon satisfactory completion of the semiannual inspection and correction of all defects, providing the owner with an inspection, testing and service compliance tag. Such tag shall indicate the date issued, the name and license number of the licensed master fire suppression piping contractor issuing the tag, and that the system was found to be in compliance with the requirements of this section.

4. **Fusible link and sprinkler head replacement – Maintenance – Annually – {Reference C9C1} –** Fusible links and sprinkler heads shall be replaced at least annually, and other protection devices shall be serviced or replaced in accordance with the manufacturer's instructions.
   - Exception: Frangible bulbs are not required to be replaced annually.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

DRY AND WET CHEMICAL FIRE EXTINGUISHING SYSTEMS
PA 4080 / 12-20

GENERAL INFORMATION – FIXED WET CHEMICAL SYSTEMS

Building ID: **System ID:**

Date: **Original Installation Date:**

General

Manufacturer:	
Service Contractor:	
Extinguishing agent:	
Connected to base building fire alarm system?	
Location of manual release station:	
Equipment Protected – Provide details on the equipment protected by this system and the sequence of operation. If protecting kitchen cooking equipment, confirm that fuel and power under the hood. Attach additional documentation if needed.	

Wet Chemical Cylinder(s)

Normal Pressure:	psi
Manufacturer's Minimum Pressure:	psi
Normal Weight:	lbs
Manufacturer's Minimum Weight:	lbs

Expellant Gas Cartridge(s)

Normal Weight (if carbon dioxide)	lbs (kg)
Normal Pressure (if nitrogen)	psi (bar)

Notes

CHAPTER 10 – CLEAN AGENT FIRE EXTINGUISHING SYSTEMS

General Requirements for Clean Agent Fire Extinguishing Systems (applicable at all facilities)

FCNYS 2020 904.10. Clean-Agent Systems. Clean-agent fire-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 2001 and their listing. Records of inspections and testing shall be maintained.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 904.10. Clean agent systems. Clean agent fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with FC 901, 904.1.1 and 904.4, NFPA 2001, as modified by FC Appendix B, and their listing. The use of a clean agent fire extinguishing system shall be limited to automatic total flooding systems.

A1. Existing Clean Agent Systems General Information — Update — Form PA 4081

Frequency – Annually

Review General Information Form for all Clean Agent Fire Extinguishing Systems, update as required.

Confirm that the as-built instruction, maintenance manual, and a full set of drawings is provided as required:

5.1.2.4 An "as-built" instruction and maintenance manual that includes a full sequence of operations and a full set of drawings and calculations shall be maintained on site.

A2. New or Altered Clean Agent Systems General Information — Update — Form PA 4081

Frequency – As Required

Complete General Information Form for new Clean Agent Fire Extinguishing System or update General Information Form for Clean Agent Fire Extinguishing System that has been altered to include repairs and/or modifications to components.

Confirm that the as-built instruction, maintenance manual, and full set of drawings is provided as required:

5.1.2.4 An "as-built" instruction and maintenance manual that includes a full sequence of operations and a full set of drawings and calculations shall be maintained on site.

A3. Clean Agent Systems — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2014 904.10.1	NYC Monthly SemiAnnually	Maintenance. At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing	PA 4082

		manuals at least on a semiannual basis.	

FCNYS 2020 904.10.1	NJ NYS Annually	System Test Systems shall be inspected and tested for proper operation at 12-month intervals.	PA 4082
NFPA 2001 2020 7.1.1	Annually	At least annually, all systems shall be inspected and tested for proper operation by personnel qualified in the installation and testing of clean agent extinguishing systems. Discharge tests shall not be required.	PA 4082
NFPA 2001 2020 7.1.2*		The inspection report with recommendations shall be filed with the owner of the system, and shall be permitted to be stored and accessed using paper or electronic media.	
NFPA 2001 2020 A.7.1.2		The inspection report provides the owner with information pertaining to the fire system, its condition, and any necessary repairs or modifications. The servicing company should review the inspection report to ensure that the necessary data are captured and a safe and thorough inspection is performed. The FSSA Design Guide for Use with Fire Protection Systems Inspection Forms can assist in this review and assist a new servicing company in the development of a complete inspection report form.	

A4. Clean Agent Systems — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 2001 2020 A.7.5		The manufacturer's maintenance procedure should be guided by the following outline: (1) System (a) Check overall physical appearance. (b) Disarm system prior to test. (2) Hazard (a) Determine size. (b) Determine configuration. (c) Check for unclosable openings. (d) Determine fuels. (e) Determine other aspects of the hazard that could impair effectiveness of the extinguishing systems. (3) Supervised circuits (a) Exercise all functions. (b) Check all electrical or pneumatic supervisory circuits for proper operation. (4) Control panel (a) Exercise all functions. (b) Check supervision if applicable, of each circuit (including releasing devices) as recommended by the manufacturer. (5) Power supply (a) Check routing, circuit breakers, fuses, disconnects. (6) Emergency power (a) Check battery condition. (b) Check charger operation; check fuse. (c) Check automatic changeover. (d) Check maintenance of generator (if one exists). (7) Detectors (a) Test each detector using heat, smoke, or manufacturer's approved test device. (See NFPA 72.) (b) Electric type. i Clean and adjust smoke detector and check sensitivity. ii Check wiring condition. (c) Pneumatic type: Check tightness of tubing and operation of mercury checks, using manometer. (8) Time delay (a) Exercise functions. (b) Check time limit. (c) Check that timer will complete its cycle even though wiring between it and the detector circuit is interrupted. (9) Alarms (a) Test for operation (audible and visual). (b) Check to see that warning signs are properly displayed. (10) Selector (directional) valves (a) Exercise functions. (b) Reset properly.	PA 4082

		(11) Release devices (a) Check for complete closure of dampers. (b) Check doors; check for any doors blocked open. (12) Equipment shutdown (a) Test shutdown function. (b) Check adequacy (all necessary equipment included). (13) Manual releases (a) Mechanical type. i Check pull, force, and length of pull required. ii Operate and adjust all devices. iii Check tightness of connectors. iv Check condition of conduit. v Check condition and operation of corner pulleys. (b) Electric type. i Test manual release. ii Check that covers are in place. (c) Check pneumatic releases. (d) Check accessibility during fire. (e) Separate main and reserve manual pulls that require only one operation, to obtain discharge of either main or reserve supply of gas. (f) Clearly mark and identify all manual releases. (14) Piping (a) Check security; check that piping is adequately supported. (b) Check condition; check for any corrosion. (15) Nozzles (a) Check orientation and orifice size; make sure they are unchanged from original design. (b) Check cleanliness. (c) Check security. (d) Check seals where needed. (16) Containers (a) Check physical condition; check for any sign of corrosion. (b) Check the contents for weight by acceptable methods for each cylinder. If the contents are below the required quantity specified in 7.1.3.1 and 7.1.3.2, then the containers must be refilled or replaced. (Proper operation of the liquid level gauge should be verified.) (c) Check that cylinders are securely held in position. (d) Check hydrostatic test date. (e) Check cylinder connectors for integrity and condition. (f) Check weights and cables of mechanical release system. (g) Check release devices; check for proper arrangement and security. (h) Check explosive release devices; check replacement date; check condition. (17) Test (a) Perform recommended discharge tests when there is any question about the adequacy of the system. (b) Perform recommended full discharge test when cylinder hydrostatic test is required. (18) Return all parts of system to full service. (19) Give certificate of inspection to owner. Regular service contracts with the manufacturer or installing company are recommended. Work should be performed by personnel thoroughly trained and regularly engaged in providing such service.	
NFPA 2001 2020 7.5.1		These systems shall be maintained in full operating condition at all times. Actuation, impairment, and restoration of this protection shall be reported promptly to the authority having jurisdiction.	
NFPA 2001 2020 7.5.2	Timely	Any troubles or impairments shall be corrected in a timely manner consistent with the hazard protected.	
NFPA 2001 2020 7.5.3*	Immediate	Any penetrations made through the enclosure protected by the clean agent shall be sealed immediately. The method of sealing shall restore the original fire resistance rating of the enclosure.	
NFPA 2001 2020 A.7.5.3		The method of sealing should not introduce any new hazards.	

A5. Container Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 904.10.2	SemiAnnually	Containers. The extinguishing agent quantity and pressure of the containers shall be checked at six-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure, adjusted for temperature, of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.	PA 4083
NFPA 2001 2020 7.1.3	SemiAnnually	At least semiannually, the agent quantity and pressure of refillable containers shall be checked.	PA 4083
NFPA 2001 2020 7.1.3.1		For halocarbon clean agents, if a container shows a loss in agent quantity of more than 5 percent or a loss in pressure (adjusted for temperature) of more than 10 percent, it shall be refilled or replaced.	
NFPA 2001 2020 7.1.3.2		For inert gas clean agents that are not liquefied, pressure is an indication of agent quantity. If an inert gas clean agent container shows a loss in pressure (adjusted for temperature) of more than 5 percent, it shall be refilled or replaced. Where container pressure gauges are used for this purpose, they shall be compared to a separate calibrated device at least annually.	
NFPA 2001 2020 7.1.3.3		Where the quantity of agent in the container is determined by special measuring devices, these devices shall be listed.	
NFPA 2001 2020 7.1.4*		Halocarbon clean agent removed from refillable containers during service or maintenance procedures shall be recovered and recycled or disposed of in accordance with any applicable laws and regulations.	
NFPA 2001 2020 A.7.1.4		Inert gas clean agents based on those gases normally found in the earth's atmosphere need not be recycled. It is preferable to recycle recovered halogenated clean agents rather than to destroy them. If recovered halogenated agent is found by test to contain contaminants that make it either technically or economically unfeasible to process the recovered agent to bring it into compliance with 4.1.2, the agent should be destroyed in an environmentally acceptable manner.	
NFPA 2001 2020 7.1.5	SemiAnnually	Factory-charged, nonrefillable containers that do not have a means of pressure indication shall have the agent quantity checked at least semiannually. If a container shows a loss in agent quantity of more than 5 percent, it shall be replaced. Halocarbon clean agent in factory-charged, nonrefillable containers removed from useful service shall be recovered and recycled or disposed of in accordance with any applicable laws and regulations.	PA 4083
NFPA 2001 2020 7.1.6		Recovered halocarbon clean agents shall not be released into the atmosphere. Halocarbon clean agent containers shall not be disposed of in any manner that could result in eventual agent release.	
NFPA 2001 2020 7.1.7		For halocarbon clean agents, the date of inspection, gross weight of cylinder plus agent or net weight of agent, type of agent, person performing the inspection, and, where applicable, the pressure at a recorded temperature shall be recorded on a tag attached to the container. For inert gas clean agents, the date of inspection, type of agent, person performing the inspection, and the pressure at a recorded temperature shall be recorded on a tag attached to the container.	
NFPA 2001 2020 A.7.2		The Fire Suppression Systems Association has prepared a guide that provides essential information on the regulatory requirements for transportation and requalification of cylinders used in clean agent fire extinguishing systems. FSSA's Test Guide for Use with Special Hazard Fire Suppression Systems Containers lists manufacturer-specific cylinder data. The quick reference guide will assist service personnel to determine the required test and requalification of the system container.	
NFPA 2001 2020 7.2.1*		U.S. Department of Transportation (DOT), Canadian Transport Commission (CTC), or similar design clean agent containers shall not be recharged without retesting if more than 5 years have elapsed since the date of the last test and inspection. For halocarbon agent storage containers, the retest shall be permitted to consist of a complete visual inspection as described in 49 CFR.	
NFPA 2001 2020 A.7.2.1		Transporting charged containers that have not been tested within 5 years could be illegal. Federal and local regulations should be consulted.	
NFPA 2001 2020 7.2.2*	5 Years	Cylinders continuously in service without discharging shall be given a complete external visual inspection every 5 years or more frequently if required. The visual inspection shall be in accordance with Section 3 of CGA C-6, except that the cylinders need not be emptied or stamped while under pressure. Inspections shall be made only by competent personnel, and the results recorded on both of the following: (1) A record tag permanently attached to each cylinder (2) A suitable inspection report	PA 4083

NFPA 2001 2020 A.7.2.2		These guidelines apply only to the external inspection of containers continuously in service in the fire extinguishing system and should not be confused with the DOT retest requirements for visual inspection described in 49 CFR. Proper recordkeeping is an important part of every inspection. The inspector should be guided by the following outline to ensure that the minimum information is recorded: (1) Record tag. A record tag should be attached to every container being inspected for future reference. The record tag should be marked with date of inspection (month/year), name of individual(s) and company performing the inspection, container serial number, condition of the container (paint, corrosion, dents, gouges, etc.), and disposition. (2) Inspection report. The following information should be recorded on an inspection report: date of inspection (month/year), name of individual(s) and company performing the inspection, DOT specification number, container serial number, date of manufacture, date of previous inspection and/or test, type of protective coating, surface condition (corrosion, dents, gouges, fire damage, etc.), and disposition (satisfactory, repaint, repair, scrap, etc.). A sample of a suitable inspection report form can be found in Appendix A of CGA C-6.	
NFPA 2001 2020 7.2.2.1		A completed copy of the inspection report shall be furnished to the owner of the system or an authorized representative. These records shall be retained by the owner for the life of the system.	
NFPA 2001 2020 7.2.3		Where external visual inspection indicates that the container has been damaged, additional strength tests shall be required.	

A6. Hose — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 904.10.3	Annually	System Hoses System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. All hoses shall be tested at five-year intervals.	PA 4083
NFPA 2001 2020 7.3.1	Annually	General. All system hose shall be examined annually for damage. If visual examination shows any deficiency, the hose shall be immediately replaced or tested as specified in 7.3.2.	PA 4083
NFPA 2001 2020 7.3.2.1	5 Years	All hose shall be tested every 5 years.	PA 4083
NFPA 2001 2020 7.3.2.2		All hose shall be tested at 1 ½ times the maximum container pressure at 130°F (54.4°C). The testing procedure shall be as follows: (1) The hose is removed from any attachment. (2) The hose assembly is then placed in a protective enclosure designed to permit visual observation of the test. (3) The hose must be completely filled with water before testing. (4) Pressure then is applied at a rate-of-pressure rise to reach the test pressure within 1 minute. The test pressure is then maintained for 1 full minute. Observations are then made to note any distortion or leakage. (5) If the test pressure has not dropped or if the couplings have not moved, the pressure is released. The hose assembly is considered to have passed the hydrostatic test if no permanent distortion has taken place. (6) Hose assembly passing the test must be completely dried internally. If heat is used for drying, the temperature must not exceed the manufacturer's specifications. (7) Hose assemblies failing a hydrostatic test must be marked and destroyed and be replaced with new assemblies. (8) Each hose assembly passing the hydrostatic test is marked to show the date of test.	

A7. Room Enclosure — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 2001 2020 7.4.	Annually	Enclosure Inspection. Other than as identified in 7.4.1, the enclosure protected by the clean agent shall be inspected at least every 12 months to determine if penetrations have occurred that could lead to agent leakage, if other changes have occurred that could change volume of hazard, or both. Where the inspection indicates conditions that could result in the inability of the enclosure to maintain the clean agent concentration, the conditions shall be corrected. If uncertainty still exists, the enclosure shall be retested for integrity in accordance with 7.7.2.5.	PA 4082
NFPA 2001 2020 7.4.1		An enclosure inspection shall not be required every 12 months if a documented administrative control program exists that addresses barrier integrity.	

CLEAN AGENT FIRE EXTINGUISHING SYSTEMS
GENERAL INFORMATION

PA 4081 / 12-20

Building ID: **System ID:**

Date: **Original Installation Date:**

General

Clean Agent System Make/Model/Manufacturer:	
Control Panel Location/Make/Manufacturer:	
Clean Agent Design Concentration:	
Describe Areas Protected – Include above suspended ceilings and/or below raised floors:	
Number of Clean Agent Cylinders Installed: (main & reserve)	
Number of Clean Agent Cylinders required for Discharge:	
Document Weights of all Cylinders with Clean Agent:	
Clean Agent Pressure:	

System Initiation

Number and Type of Fire Detection Devices:	
Location of Manual Release Station:	
Sequence of Operation:	

Notes:

CLEAN AGENT FIRE EXTINGUISHING SYSTEMS
INSPECTION / TESTING

PA 4082 / 12-20

Building ID: **System ID:**

- Use this form to document inspections of Clean Agent extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Clean Agent Systems – Inspection – Monthly – {Reference C10A3} –** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order.

2. **Clean Agent Systems – Inspection – SemiAnnually – {Reference C10A3} –** Inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

3. **Clean Agent Systems – Inspection/Testing – Annually – {Reference C10A3} –** Systems shall be inspected and tested for proper operation at 12-month intervals. All systems shall be inspected and tested for proper operation by personnel qualified in the installation and testing of clean agent extinguishing systems. Discharge tests shall not be required.

4. **Clean Agent Systems – Maintenance – Outline – {Reference C10A4} –** Assess whether the system is in good working order including but not limited to:

System – Check overall physical appearance.	Hazard - Check for unclosable openings.	Hazard – Determine other aspects of the hazard that could impair effectiveness of the extinguishing systems.	Supervised circuits - Exercise all functions.
Control panel - Exercise all functions.	Power supply - Check routing, circuit breakers, fuses, disconnects.	Emergency power - Check automatic changeover.	Detectors - Test each detector using heat, smoke, or manufacturer's approved test device.
Time delay - Exercise functions.	Alarms – Test for operation (audible and visual).	Release devices - Check for complete closure of dampers.	Release devices - Check doors; check for any doors blocked open.
Equipment shutdown - Test shutdown function.	Manual releases – Test manual release.	Nozzles - Check orientation and orifice size; make sure they are unchanged from original design.	Piping - Check condition; check for any corrosion.
Containers – Check the contents for weight by acceptable methods for each cylinder.	Containers – Check that cylinders are securely held in position.	Containers – Check hydrostatic test date.	Test – Perform recommended full discharge test when cylinder hydrostatic test is required.

5. **Room Enclosure – Inspection – Annually – {Reference C10A7}** – The enclosure protected by the clean agent shall be inspected at least every 12 months to determine if penetrations have occurred that could lead to agent leakage, if other changes have occurred that could change volume of hazard, or both. Where the inspection indicates conditions that could result in the inability of the enclosure to maintain the clean agent concentration, the conditions shall be corrected. If uncertainty still exists, the enclosure shall be retested for integrity

S = Satisfactory **U = Unsatisfactory**

Room/System ID	Date	Inspector	Task/Result	Notes

CLEAN AGENT FIRE EXTINGUISHING SYSTEMS
CONTAINER / HOSE – INSPECTION / TESTING

PA 4083 / 12-20

Building ID: **System ID:**

- Use this form to document inspections of Clean Agent extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Containers – Inspection – SemiAnnually – {Reference C10A5} –** The extinguishing agent quantity and pressure of the containers shall be checked at six-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure, adjusted for temperature, of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

2. **Containers – Inspection – SemiAnnually – {Reference C10A5}** – Factory-charged, nonrefillable containers that do not have a means of pressure indication shall have the agent quantity checked at least semiannually. If a container shows a loss in agent quantity of more than 5 percent, it shall be replaced.

3. **Containers – Inspection – 5 Years – {Reference C10A5} –** Cylinders continuously in service without discharging shall be given a complete external visual inspection every 5 years or more frequently if required.

4. **Hose – Inspection – Annually – {Reference C10A6} –** All system hose shall be examined annually for damage. If visual examination shows any deficiency, the hose shall be immediately replaced or tested.

5. **Hose – Testing – 5 Years – {Reference C10A6}** – All hose shall be tested every 5 years. All hose shall be tested at 1 ½ times the maximum container pressure at 130°F (54.4°C).

S = Satisfactory **U = Unsatisfactory**

Equipment ID / System ID	Date	Inspector	Task/Result	Notes

CHAPTER 11 – FIRE DETECTION AND ALARM SYSTEMS

General Requirements for Fire Detection and Alarm Systems (applicable at all facilities)

FCNYS 2020 901.6.	Inspection, Testing and Maintenance. Fire detection and alarm systems, emergency alarm systems, gas detection systems, fire-extinguishing systems, mechanical smoke exhaust systems and smoke and heat vents shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired fire protection systems and equipment shall be inspected, tested and maintained or removed.
FCNYS 2020 901.6.2	Integrated Testing. Where two or more fire protection or life safety systems are interconnected, the intended response of subordinate fire protection and life safety systems shall be verified when required testing of the initiating system is conducted. In addition, integrated testing shall be performed in accordance with Sections 901.6.2.1 and 901.6.2.2.
FCNYS 2020 901.6.2.1	High-Rise Buildings. For high-rise buildings, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding 10 years, unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire protection or life safety functions that are initiated by equipment that was repaired or replaced.
IFCNJ 2015 901.9	Termination of Monitoring Service. For fire alarm systems required to be monitored by this code, notice shall be made to the fire code official whenever alarm monitoring services are terminated. Notice shall be made in writing, to the fire code official by the monitoring service provider being terminated.
IFCNJ 2015 907.6.5	Access. Access shall be provided to each fire alarm device and notification appliance for periodic inspection, maintenance and testing.
IFCNJ 2015 907.6.6	Monitoring. Fire alarm systems shall be maintained as required by the construction code in effect at the time of the fire alarm system installation. Exception: Monitoring by a supervising station is not required for: 1. Single- and multiple-station smoke alarms. 2. Smoke detectors in Group I-3 occupancies. 3. Automatic sprinkler systems in one- and two-family dwellings.
NYCFC 2014 907.19	Instructions. Inspection, testing, operation and maintenance instructions, as built design and installation documents and equipment specifications shall be provided on site at an approved location.
FCNYS 2020 907.8	Inspection, Testing and Maintenance. The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with Sections 907.8.1 through 907.8.5 and NFPA 72. Records of inspection, testing and maintenance shall be maintained.
FCNYS 2020 907.8.1	Maintenance Required. Where required for compliance with the provisions of this code, devices, equipment, systems, conditions, arrangements, levels of protection or other features shall thereafter be continuously maintained in accordance with applicable NFPA requirements or as directed by the fire code official.
IFCNJ 2015 907.8.2	Testing. Testing shall be performed in accordance with the schedules in NFPA 72 or more frequently where required by the fire code official. Records of testing shall be maintained. Exception: Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where approved by the fire code official, but not less than every 18 months.

FCNYS 2020 907.8.3	Smoke Detector Sensitivity. Smoke detector sensitivity shall be checked within one year after installation and every alternate year thereafter. After the second calibration test, where sensitivity tests indicate that the detector has remained within its listed and marked sensitivity range (or 4-percent obscuration light gray smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to not more than 5 years. Where the frequency is extended, records of detector-caused nuisance alarms and subsequent trends of these alarms shall be maintained. In zones or areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed.
FCNYS 2020 907.8.4	Sensitivity Test Method. To verify that each smoke detector is within its listed and marked sensitivity range, it shall be tested using one of the following methods: 1. A calibrated test method. 2. The manufacturer's calibrated sensitivity test instrument. 3. Listed control equipment arranged for the purpose. 4. A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where the detector's sensitivity is outside its acceptable sensitivity range. 5. Another calibrated sensitivity test method acceptable to the fire code official. Detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or replaced. Exceptions: 1. Detectors listed as field adjustable shall be permitted to be either adjusted within the listed and marked sensitivity range and cleaned and recalibrated or they shall be replaced. 2. This requirement shall not apply to single-station smoke alarms.
FCNYS 2020 907.8.4.1	Sensitivity Testing Device. Smoke detector sensitivity shall not be tested or measured using a device that administers an unmeasured concentration of smoke or other aerosol into the detector.
FCNYS 2020 907.8.5	Inspection, Testing and Maintenance. The building owner shall be responsible to maintain the fire and life safety systems in an operable condition at all times. Service personnel shall meet the qualification requirements of NFPA 72 for inspection, testing and maintenance of such systems. Records of inspection, testing and maintenance shall be maintained.
IFCNJ 2015 908.8	High-Level Alarms Testing. All high-level alarm systems installed in accordance with N.J.A.C. 5:72 shall be periodically tested in accordance with N.J.A.C. 5:72-3.2(a)4.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 901.6.3	Supervision. A person holding a certificate of fitness for the following fire protection systems shall personally supervise the inspection, testing, servicing and other maintenance required by this code or the rules with respect to the system supervised by such certificate of fitness holder: 4. Fire alarm systems.
NYCFC 2014 901.6.3.4	Smoke detector cleaning and testing. The cleaning and testing for smoke entry and sensitivity of smoke detectors installed in a fire alarm system shall be performed by a person holding a certificate of fitness for smoke detector maintenance. Such work shall be performed under the supervision and by employees of a person holding a smoke detector maintenance company certificate, except that such smoke detector cleaning and testing may be performed by an owner or occupant of the premises, or an employee of such owner or occupant, who possesses a certificate of fitness for smoke detector maintenance, and possesses the tools, instruments or other equipment necessary to perform such services in accordance this code and the rules. All other smoke detector maintenance shall be performed by a person possessing the requisite qualifications and experience, and any applicable license or certificate.

NYCFC 2014 907.2.	Inspection, testing and other maintenance. Fire alarm and fire alarm detection systems shall be operated and maintained in accordance with this code, FC901, the rules and NFPA 72, as modified by FC Appendix B
NYCFC 2014 907.20	Inspection, testing and other maintenance. Fire alarm and fire alarm detection systems shall be operated and maintained in accordance with this code, FC901, the rules and NFPA 72, as modified by FC Appendix B.
NYCFC 2014 907.20.2	Testing. Testing shall be performed in accordance with the schedules in NFPA 72, as modified by FC Appendix B, or more frequently where required by the commissioner. Exception: Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where approved by the commissioner, but not less than every 18 months.
NYCFC 2014 907.20.3	Detector sensitivity. Detector sensitivity shall be checked in compliance with the manufacturer's instructions and NFPA 72, as modified by FC Appendix B, and the rules. Detectors which are connected to a fire alarm system that automatically transmit signals to the department or to a central station shall, as applicable, also be checked in compliance with the rules.
NYCFC 2014 907.20.4	Method. To verify that each smoke detector is within its listed and marked sensitivity range, it shall be tested using one of the following methods or types of equipment, and detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or replaced: 1. A calibrated test method; 2. The manufacturer's calibrated sensitivity test instrument; 3. Listed control equipment arranged for the purpose; 4. A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where its sensitivity is outside its acceptable sensitivity range; or 5. Another calibrated sensitivity test method acceptable to the commissioner. Exceptions: 1. Detectors listed as field adjustable shall be allowed to be either adjusted within the listed and marked sensitivity range and cleaned and recalibrated or they shall be replaced. 2. This requirement shall not apply to single-station smoke alarms.
NYCFC 2014 907.20.5	Maintenance. The owner shall maintain fire and life safety systems in good working order at all times. Service personnel shall possess the qualifications set forth in NFPA 72, as modified by FC Appendix B, and the rules, for inspecting, testing, servicing and otherwise maintaining such systems. When required by the rules, a smoke detector maintenance log book and an alarm log book shall be maintained.
NYCFC 2014 907.20.6	Smoke detector maintenance. The owner of any premises, or part thereof, monitored by a fire alarm system or sub-system thereof, whether required or not required by this code, which automatically transmits signals to the department or to a central station, shall be responsible for preventing unnecessary and unwarranted alarms as set forth in rules. Cleaning and testing of smoke detectors shall be performed as set forth in the rules.
NYCFC 2014 907.20.7	Hold-open devices. The fire alarm system connections for hold-open devices installed on fire doors pursuant to the Building Code, including hold-open devices provided for vertical exit enclosure doors pursuant to the exception to Section BC 708.7 of the Building Code, shall be inspected, tested and otherwise maintained in accordance with FC 703.2 and 907.20 and NFPA 72. Hold-open devices and automatic door closers provided for such vertical exit enclosure doors shall be inspected and tested annually to ensure the proper functioning of: 1. the manual control on the fire alarm system control panel, or the fire command center where a fire command center is required, that transmits a signal to release the hold-open devices; 2. the fire alarm system output programming, which automatically transmits a signal to release the hold-open devices upon activation of an automatic alarm initiating device or manual elevator recall; 3. the circuitry for each hold-open device, which upon receipt of a manual or automatic signal, releases the door; and 4. each automatic door closer, which, upon release of the door by the hold-open device, mechanically moves the door to its fully closed position. (Added by LL 17/2014, effective 10/1/14)

NYCFC 2014 908.10	Maintenance. Emergency alarm and detection systems governed by this section shall be inspected, tested, serviced and otherwise maintained in accordance with the manufacturer's specifications. Those approved for connection to a fire alarm system or which will transmit an alarm to a central station shall additionally comply with the requirements of NFPA 72, as modified by FC Appendix B, and the rules governing the operation and maintenance of such systems.
NYCFC 2014 908.10.1	Carbon monoxide. Carbon monoxide detectors shall be inspected, tested, serviced and otherwise maintained in compliance with the requirements of the construction codes, including the Building Code, and, where applicable, the requirements of the New York City Department of Housing Preservation and Development. Those connected to a fire alarm system or which will transmit an alarm to a central station shall additionally comply with the requirements of FC901.6, NFPA 72, as modified by FC Appendix B, NFPA 720 and the rules governing the operation and maintenance of such systems.

A. All Fire Detection and Alarm Systems

A1. Existing Fire Alarm Control Panels — Update — Form PA 4085

General Information

Frequency – Annually

Review General Information Form for Fire Alarm Control Panels, update as required

A2. New or Altered Fire Alarm Control Panels – General Information — Update — Form PA 4085

Frequency – As Required

Complete General Information Form for new Fire Alarm Control Panels or update General Information Form for Fire Alarm Control Panels that have been altered to include repairs and/or modifications to components.

A3. Existing Fire Alarm Initiating Devices General Information — Update — Form PA 4086

Frequency – Annually

Review General Information Form for Alarm Initiating Devices, update as required

A4. New or Altered Fire Alarm Initiating Devices – General Information — Update — Form PA 4086

Frequency – As Required

Complete General Information Form for new Alarm Initiating Devices or update General Information Form for Alarm Initiating Devices that have been altered to include repairs and/or modifications to components.

A5. Existing Fire Alarm Notification Devices – General Information — Update — Form PA 4087

Frequency – Annually

Review General Information Form for all Fire Detection and Alarm Systems, update as required

A6. New or Altered Fire Alarm Notification Devices – General Information — Update — Form PA 4087

Frequency – As Required

Complete General Information Form for new Fire Detection and Alarm Systems or update General Information Form for Fire Detection and Alarm Systems that have been altered to include repairs and/or modifications to components.

A7. All Equipment — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(1)	Annually	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.	PA 4085 PA 4086 PA 4087
NFPA 72 2016 14.3.5		Periodic visual inspections in accordance with Table 14.3.1 shall be made to assure that there are no changes that affect equipment performance.	

A8. All Equipment — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 14.2.6		Releasing Systems. Requirements pertinent to testing the fire alarm systems initiating fire suppression system releasing functions shall be covered by 14.2.6.1 through 14.2.6.6.	
NFPA 72 2016 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 cognizant of the hazards associated with inadvertent system discharge.	
NFPA 72 2016 14.2.6.2		Occupant notification shall be required whenever a fire alarm system configured for releasing service is being serviced or tested.	
NFPA 72 2016 14.2.6.3		Discharge testing of suppression systems shall not be required by this Code.	
NFPA 72 2016 14.2.6.4		Suppression systems shall be secured from inadvertent actuation, including disconnection of releasing solenoids or electric actuators, closing of valves, other actions, or combinations thereof, for the specific system, for the duration of the fire alarm system testing.	
NFPA 72 2016 14.2.6.5		Testing shall include verification that the releasing circuits and components energized or actuated by the fire alarm system are electrically monitored for integrity and operate as intended on alarm.	
NFPA 72 2016 14.2.6.6		Suppression systems and releasing components shall be returned to their functional operating condition upon completion of system testing.	

B. Alarm Notification Appliances

B1. Alarm Notification Appliances — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(22)		Notification appliances Verify location and condition (all appliances).	
NFPA 72 2016 Table 14.3.1(22)	Semiannually	(a) Audible appliances	PA 4088
NFPA 72 2016 Table 14.3.1(22)	Semiannually	(b) Audible textual notification appliances	PA 4088

NFPA 72 2016 Table 14.3.1(22)	Semiannually	(c) Visible appliances (1) General	PA 4088
NFPA 72 2016 Table 14.3.1(22)	N/A Note: N/A = not applicable, no minimum requirement established.	(c) Visible appliances (2) Candela rating Verify that the candela rating marking agrees with the approved drawings.	

B2. Alarm Notification Appliances — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(22)	NJ NYS Annually	(a) Audible [n] Note [n] – 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. For periodic testing, verify the operation of the notification appliances. [o] Note [o] – 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 the initial acceptance testing criteria.	PA 4088
NFPA 72 2010 Table 14.4.2.2(15) Table 14.4.5(20)	NYC Annually	(a) Audible (2) Periodic testing shall comply with the following: Sound pressure levels for signals shall be measured with a sound level meter meeting ANSI S1.4a, Specifications for Sound Level Meters, Type 2 requirements. Sound pressure levels shall be measured for conformity to Chapter 18 where building, system, or occupancy changes have occurred. The sound level meter shall be set in accordance with ANSI S3.41, American National Standard Audible Evacuation Signal, using the time-weighted characteristic F (FAST).	PA 4088
NFPA 72 2016 Table 14.4.3.2(22)	NJ NYS Annually	(b) Audible textual notification appliances (speakers and other appliances to convey voice messages) Verify audible information to be distinguishable and understandable and in compliance with 14.4.10. For periodic testing, verify the operation of the notification appliances. [o] Note [o] – 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 the initial acceptance testing criteria.	PA 4088
NFPA 72 2016 14.4.10.1		Voice communication using prerecorded messages and manual voice announcements shall be verified as being intelligible in accordance with the requirements of 18.4.10.	
NFPA 72 2010 Table 14.4.2.2(15) Table 14.4.5(20)	NYC Annually	(b) Audible textual notification appliances (speakers and other appliances to convey voice messages) (2) Periodic testing shall comply with the following: Sound pressure levels for signals shall be measured with a sound level meter meeting ANSI S1.4a, Specifications for Sound Level Meters, Type 2 requirements. Sound pressure levels shall be measured for conformity to Chapter 18 where building, system, or occupancy changes have occurred. The sound level meter shall be set in accordance with ANSI S3.41, American National Standard Audible Evacuation Signal, using the time-weighted characteristic F (FAST). Audible information shall be verified to be distinguishable and understandable and shall comply with 14.4.13 where building, system, or occupancy changes have occurred.	PA 4088
NFPA 72 2016 Table 14.4.3.2(22)	NJ NYS Annually	(c) Visible – For periodic testing, verify that each appliance flashes.	PA 4088
NFPA 72 2010 Table 14.4.2.2(15)	NYC Annually	(c) Visible – Test shall be performed in accordance with the manufacturer's published instructions. Appliance locations shall be verified to be per approved layout, and it shall be confirmed that no floor plan changes affect the approved layout. It shall be verified that the	PA 4088

Table 14.4.5(20)		candela rating marking agrees with the approved drawing. It shall be confirmed that each appliance flashes.	

C. Alarm Initiation Devices and Equipment

C1. Initiation Devices — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(17)(a)	SemiAnnually	(a) Air sampling (1) General – Verify that in-line filters, if any, are clean.	PA 4089
NFPA 72 2016 Table 14.3.1(17)	N/A	(a) Air sampling (2) Sampling system piping and sampling ports – 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.	
NFPA 72 2016 Table 14.3.1(17)	SemiAnnually	(b) Duct detectors (1) General – 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.	PA 4089
NFPA 72 2016 Table 14.3.1(17)	Annually	(b) Duct detectors (2) Sampling tube – Verify proper orientation. Confirm the sampling tube protrudes into the duct in accordance with system design.	PA 4089
NFPA 72 2016 Table 14.3.1(17)	SemiAnnually	(c) Electromechanical releasing devices	PA 4090
NFPA 72 2016 Table 14.3.1(17)	SemiAnnually	(d) Fire extinguishing system(s) or suppression system(s) switches	PA 4090
NFPA 72 2016 Table 14.3.1(17)	SemiAnnually	(e) Manual fire alarm boxes	PA 4094
NFPA 72 2016 Table 14.3.1(17)	SemiAnnually	(f) Heat detectors	PA 4091
NFPA 72 2016 Table 14.3.1(17)	Quarterly	(g) Radiant energy fire detectors Verify no point requiring detection is obstructed or outside the detector's field of view.	PA 4092
NFPA 72 2016 Table 14.3.1(17)	Quarterly	(h) Video image smoke and fire detectors Verify no point requiring detection is obstructed or outside the detector's field of view.	PA 4092
NFPA 72 2016 Table 14.3.1(17)	SemiAnnually	(i) Smoke detectors (excluding one and two-family dwellings)	PA 4093
NFPA 72 2016 Table 14.3.1(17)	SemiAnnually	(j) Projected beam smoke detectors Verify beam path is unobstructed.	PA 4094
NFPA 72 2016 Table 14.3.1 (17)	Quarterly	(k) Supervisory signal devices	PA 4095
NFPA 72 2016 Table 14.3.1 (17)	Quarterly	(l) Waterflow devices	PA 4095

C2. Initiating Devices – Supervisory Signals — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2	Annually	Note [f] – 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 NFPA101 9.6.3) to initiate supervisory signals at the fire alarm control unit (FACU) should be tested at the same frequency (annual) as those devices when they are generating an alarm signal. They are not supervisory devices, but they initiate a supervisory signal at the FACU.	PA 4099

C3. Initiation Devices – Smoke Detectors — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)(g)	Annually	(5) Duct type – In addition to the testing required in Table 14.4.3.2(17)(g)(1) and Table 14.4.3.2(17)(h), 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.	PA 4089
NFPA 72 2016 Table 14.4.3.2(17)(g)	Annually	(1) In other than one- and two-family dwellings, system detectors – Test smoke detectors in place to ensure smoke entry into the sensing chamber and an alarm response. 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, into the sensing chamber can be used. Note [h] - Note, 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.	PA 4093
NFPA 72 2016 Table 14.4.3.2(17)(g)	Annually	(2) Single- and multiple-station smoke alarms connected to protected premises systems – 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 and verifying that the protected premises system receives a supervisory signal and does not cause a fire alarm signal.	PA 4093
NFPA 72 2016 Table 14.4.3.2(17)(g)	Annually	(4) Air sampling – Test with smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. Test from the end sampling port or point on each pipe run. Verify airflow through all other ports or points.	PA 4089
NFPA 72 2016 Table 14.4.3.2(17)(g)	Annually	(6) Projected beam type – Test the detector by introducing smoke, other aerosol, or an optical filter into the beam path.	PA 4094
NFPA 72 2016 Table 14.4.3.2(17)(g)	Annually	(7) Smoke detector with built-in thermal element – Operate both portions of the detector independently as described for the respective devices.	PA 4093
NFPA 72 2016 Table 14.4.3.2(17)(g)	Annually	(8) Smoke detectors with control output functions – 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.	PA 4093

C4. Initiation Devices –Smoke Detectors Sensitivity Testing — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	Frequency See 14.4.4.3	(h) Smoke detectors — sensitivity testing – In other than one- and two-family dwellings, system detectors Perform any of the following tests to ensure that each smoke detector is within its listed and marked sensitivity range: (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	PA 4096

		Note [i] – There are some detectors that use magnets as a manufacturer's calibrated sensitivity test instrument.	
NFPA 72 2016 14.4.4.3*		In other than one- and two-family dwellings, sensitivity of smoke detectors shall be tested in accordance with 14.4.4.3.1 through 14.4.4.3.6.	
NFPA 72 2016 A.14.4.4.3		Detectors that cause unwanted alarms should be tested at their lower listed range (or at 0.5 percent obscuration if unmarked or unknown). Detectors that activate at less than this level should be replaced.	
NFPA 72 2016 14.4.4.3.1	1 Year after Installation	Sensitivity shall be checked within 1 year after installation.	PA 4096
NFPA 72 2016 14.4.4.3.2	Every alternate year thereafter	Sensitivity shall be checked every alternate year thereafter unless otherwise permitted by compliance with 14.4.4.3.3.	PA 4096
NFPA 72 2016 14.4.4.3.3		After the second required calibration test, if sensitivity tests indicate that the device has remained within its listed and marked sensitivity range (or 4 percent obscuration light gray smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to a maximum of 5 years.	
NFPA 72 2016 14.4.4.3.3.1		If the frequency is extended, records of nuisance alarms and subsequent trends of these alarms shall be maintained.	
NFPA 72 2016 14.4.4.3.3.2		In zones or in areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed.	
NFPA 72 2016 14.4.4.3.4		Unless otherwise permitted by 14.4.4.3.5, smoke detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or be replaced.	
NFPA 72 2016 14.4.4.3.5		Smoke detectors listed as field adjustable shall be permitted to either be adjusted within the listed and marked sensitivity range, cleaned, and recalibrated, or be replaced.	
NFPA 72 2016 14.4.4.3.6		The detector sensitivity shall not be tested or measured using any device that administers an unmeasured concentration of smoke or other aerosol into the detector or smoke alarm.	

C5. Initiation Devices – Carbon Monoxide Detectors / Carbon Monoxide Alarms / Fire Detection — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(19)	SemiAnnually	(b) Carbon monoxide detectors/systems – Verify location and condition (all types).	PA 4096

C6. Initiation Devices – Carbon Monoxide Detectors / Carbon Monoxide Alarms / Fire Detection — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	Annually	(i) Carbon monoxide detectors/carbon monoxide alarms for the purposes of fire detection – 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 their published instructions.	PA 4096
NFPA 72 2010 Table 14.4.2.2(14)(g) Table 14.4.5(15)	NYC Annually	(2) Smoke/carbon monoxide alarms in other than one- and two-family dwellings. – The smoke alarms shall be tested in place to ensure smoke entry into the sensing chamber and an alarm response. Testing with real smoke or listed simulated aerosol or listed smoke particulate approved by the manufacturer shall be permitted as acceptable test methods. Other methods listed in the manufacturer's published instructions that ensure smoke entry from the protected area, through the vents, into the sensing chamber shall be permitted. Any of the following tests shall be performed to ensure that each smoke alarm is within its listed and marked sensitivity range: (1) Calibrated test method (2) Manufacturer's calibrated sensitivity test instrument (3) Other calibrated sensitivity test method approved by the authority having jurisdiction	PA 4096

		The carbon monoxide alarm shall be tested in accordance with NFPA 720. (h) System smoke detectors — functional test	

C7. Initiation Devices – Electromechanical Releasing Devices — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)(a)	Annually	(1) Nonrestorable-type link – Verify correct operation by removal of the fusible link and operation of the associated device. Lubricate any moving parts as necessary.	PA 4090
NFPA 72 2016 Table 14.4.3.2(17)(a)	Annually	(2) Restorable-type link [g] – Verify correct operation by removal of the fusible link and operation of the associated device. Lubricate any moving parts as necessary. Note [g] – Fusible thermal link detectors are commonly used to close fire doors and fire dampers. They are actuated by the presence of external heat, which causes 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 Note fuse and separate.	PA 4090

C8. Initiation Devices – Fire Extinguishing System(s) or Suppression System(s) Alarm Switch — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	Annually	(b) Fire extinguishing system(s) or suppression system(s) alarm switch – Operate the switch mechanically or electrically and verify receipt of signal by the fire alarm control unit.	PA 4090

C9. Initiation Devices – Fire / Gas and Other Detectors — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	Annually	(c) Fire–gas and other detectors – Test fire–gas detectors and other fire detectors as prescribed by the manufacturer and as necessary for the application.	PA 4092

C10. Initiation Devices – Heat Detectors — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)(d)	Annually (see 14.4.4.5)	(1) Fixed-temperature, rate-of-rise, rate of compensation, restorable line, spot type (excluding pneumatic tube type) – 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.	PA 4091
NFPA 72 2016 14.4.4.5		Restorable fixed-temperature, spot-type heat detectors shall be tested in accordance with 14.4.4.5.1 through 14.4.4.5.4.	
NFPA 72 2016 14.4.4.5.1		Two or more detectors shall be tested on each initiating circuit annually.	
NFPA 72 2016 14.4.4.5.2		Different detectors shall be tested each year.	
NFPA 72 2016 14.4.4.5.3		Test records shall be kept by the building owner specifying which detectors have been tested.	

NFPA 72 2016 14.4.4.5.4		Within 5 years, each detector shall have been tested.	
NFPA 72 2016 Table 14.4.3.2(17)(d)	Annually	(2) Fixed-temperature, nonrestorable line type – Do not perform heat test. Test functionality mechanically and electrically. Measure and record loop resistance. Investigate changes from acceptance test.	PA 4091
NFPA 72 2016 Table 14.4.3.2(17)(d)	See Method	(3) Fixed-temperature, nonrestorable spot type – After 15 years from initial installation, replace all devices or have 2 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.	PA 4091
NFPA 72 2016 Table 14.4.3.2(17)(d)	Annually	(4) Nonrestorable (general) – Do not perform heat tests. Test functionality mechanically and electrically.	PA 4091
NFPA 72 2016 Table 14.4.3.2(17)(d)	Annually	(5) Restorable line type, pneumatic tube only – 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.	PA 4091
NFPA 72 2016 Table 14.4.3.2(17)(d)	Annually	(6) Single- and multiple-station heat alarms – Conduct functional tests according to manufacturer's published instructions. Do not test nonrestorable heat detectors with heat.	PA 4091

C11. Initiation Devices – Multi-Sensor Fire Detector or Multi-Criteria Fire Detector or Combination Fire Detector — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	Annually	(l) Multi-sensor fire detector or multi-criteria fire detector or combination fire detector – Test each of the detection principles 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. Also test each detector in accordance with the published manufacturer's instructions. Test individual sensors together if the technology allows individual sensor responses to be verified. Perform tests as described for the respective devices by introduction of the physical phenomena to the sensing chamber of element. An electronic check (magnets, analog values, etc.) is not sufficient to comply with this requirement. Verify by using the detector manufacturer's published instructions that the test gas used will not impair the operation of either sensing chamber of a multisensor, multicriteria, or combination fire detector. Confirm the result of each sensor test through indication at the detector or control unit. Where individual sensors cannot be tested individually, test the primary sensor. [j] Record all tests and results. Note [j] – For example, it might not be possible to individually test the heat sensor in a thermally enhanced smoke detector.	PA 4096

C12. Initiation Devices – Fire Alarm Boxes — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	Annually	(e) Manual fire alarm boxes – Operate manual fire alarm boxes per the manufacturer's published instructions. Test both key-operated presignal and general alarm manual fire alarm boxes.	PA 4094

C13. Initiation Devices – Radiant Energy Fire Detectors — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	SemiAnnually	(f) Radiant energy fire detectors – 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: (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.	PA 4092

C14. Initiation Devices – Supervisory Signals — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)(j)	Semiannually	(1) Control valve switch – 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 the manufacturer's published instructions.	PA 4095
NFPA 72 2016 Table 14.4.3.2(17)(j)	NJ NYS Annually	(2) High- or low-air pressure switch – 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.	PA 4095
NFPA 72 2010 Table 14.4.2.2(14)(i) Table 14.4.5(15)(l)	NYC Quarterly	(2) High- or low-air pressure switch – Switch shall be operated. Receipt of signal obtained where the required pressure is increased or decreased a maximum 10 psi (70 kPa) from the required pressure level shall be verified. (2) Pressure supervisory indicating devices	PA 4095
NFPA 72 2016 Table 14.4.3.2(17)(j)	NJ NYS Annually	(3) Room temperature switch – 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).	PA 4095
NFPA 72 2010 Table 14.4.2.2(14)(i) Table 14.4.5(15)(l)	NYC Quarterly	(3) Room temperature switch – Switch shall be operated. 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) shall be verified. (5) Room temperature supervisory indicating devices	PA 4095
NFPA 72 2016 Table 14.4.3.2(17)(j)	NJ NYS Annually	(4) Water level switch – 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 restoral to required level.	PA 4095
NFPA 72 2010 Table 14.4.2.2(14)(i) Table 14.4.5(l)	NYC Quarterly	(4) Water level switch – Switch shall be operated. 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, shall be verified, as shall its restoral to required level. (3) Water level supervisory indicating devices	PA 4095

NFPA 72 2016 Table 14.4.3.2(17)(j)	NJ NYS Annually	(5) Water temperature switch – 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).	PA 4095
NFPA 72 2010 Table 14.4.2.2(14)(i) Table 14.4.5(l)(5)	NYC Quarterly	(5) Water temperature switch – Switch shall be operated. 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) shall be verified. (4) Water temperature supervisory indicating devices	PA 4095
NFPA 72 2010 Table 14.4.5(15)(l)	NYC Quarterly	(6) Other suppression system supervisory initiating devices	PA 4095
NFPA 72 2010 Table 14.4.5(15)(l)	NYC Annually	(7) Other supervisory initiating devices	PA 4095

C15. Initiation Devices – Waterflow Devices — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(17)	SemiAnnually	(k) Mechanical, electrosonic, or pressure-type waterflow device – Water shall be flowed 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 for wet-pipe systems, or an alarm test bypass connection for dry-pipe, pre-action, or deluge systems in accordance with NFPA 25.	PA 4095

C16. Emergency Voice / Alarm Communications Equipment — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(5)	SemiAnnually	In-building fire emergency voice/alarm communications equipment – Verify location and condition.	PA 4098

C17. Emergency Voice/Alarm Communications Equipment — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(5)	Annually	Emergency communications equipment – (a) Amplifier/tone generators – Verify correct switching and operation of backup equipment.	PA 4098
NFPA 72 2016 Table 14.4.3.2(5)	Annually	Emergency communications equipment – (b) Call-in signal silence – Operate/function and verify receipt of correct visual and audible signals at control unit.	PA 4098
NFPA 72 2016 Table 14.4.3.2(5)	Annually	Emergency communications equipment – (c) Off-hook indicator (ring down) – Install phone set or remove phone from hook and verify receipt of signal at control unit.	PA 4098
NFPA 72 2016 Table 14.4.3.2(5)	Annually	Emergency communications equipment – (d) Phone jacks – Visually inspect phone jack and initiate communications path through jack.	PA 4098
NFPA 72 2016 Table 14.4.3.2(5)	Annually	Emergency communications equipment – (e) Phone set – Activate each phone set and verify correct operation.	PA 4098
NFPA 72 2016 Table 14.4.3.2(5)	Annually	Emergency communications equipment – (f) System performance – Operate the system with a minimum of any five handsets simultaneously. Verify voice quality and clarity.	PA 4098

C18. Special Procedures — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(26)	Annually	(a) Alarm verification – Verify time delay and alarm response for smoke detector circuits identified as having alarm verification.	PA 4098
NFPA 72 2016 Table 14.4.3.2(26)	Annually	(b) Multiplex systems • 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 redundant central control equipment is provided, verify switchover and all required functions and operations of secondary control equipment. • Verify all system functions and features in accordance with manufacturer's published instructions.	PA 4098

C19. Special Hazard Equipment — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(a) Abort switch (dead-man type) – Operate abort switch and verify correct sequence and operation.	PA 4099
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(b) Abort switch (recycle type) – Operate abort switch and verify development of correct matrix with each sensor operated.	PA 4099
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(c) Abort switch (special type) – Operate abort switch and verify correct sequence and operation in accordance with authority having jurisdiction. Observe sequencing as specified on as-built drawings or in system owner's manual.	PA 4099
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(d) Cross-zone detection circuit – Operate one sensor or detector on each zone. Verify occurrence of correct sequence with operation of first zone and then with operation of second zone.	PA 4099
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(e) Matrix-type circuit – Operate all sensors in system. Verify development of correct matrix with each sensor operated.	PA 4099
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(f) Release solenoid circuit [k] – Verify operation of solenoid. Note [k] – Manufacturer's 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.	PA 4099
NFPA 72 2016 14.2.10*		Test Plan.	
NFPA 72 2016 A.14.2.10		The test plan is intended to clarify exactly what is to be tested and how it is to be tested. Testing of fire alarm and signaling systems is often done in a segmented fashion to accommodate the availability of testing or other personnel, or to minimize the interruption of building operations. Building operations can be affected by testing of the fire alarm or signaling system itself and by the operation of emergency control functions activated by the fire alarm or signaling system. The boundary of the fire alarm or signaling system extends up to and includes the emergency control function interface device. The testing requirements prescribed in NFPA 72 for fire alarm and signaling systems end at the emergency control function interface device. The purpose of the test plan is to document what devices were and were not actually tested. The testing of emergency control functions, releasing systems, or interfaced equipment is outside the scope of NFPA72. Requirements for testing other systems are found in other governing laws, codes, or standards. Requirements for integrated testing of combined systems also fall under the authority of other governing laws, codes, standards, or authority having jurisdiction. NFPA 3 provides guidance for such testing. NFPA 3 recognizes the importance of the development of an integrated testing plan. Further information on testing associated with emergency control functions can be found in Table 14.4.3.2, Item 24 and its related annex material in A.14.4.3.2.	

NFPA 72 2016 Table 14.4.3.2(24)		Emergency control functions [p] – 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. Note [p] – See A.14.4.3.2, and Table 14.4.3.2, Item 24.	
NFPA 72 2016 A.14.4.3.2		NFPA 72 2016 Table 14.4.3.2, Item 24 The extent of testing of a fire alarm or signaling system, including devices that were not tested, should be documented in accordance with the Test Plan in 14.2.10. NFPA 72 does not require testing of an emergency control function, such as elevator recall, but does require testing of the emergency control function interface device, such as the relay powered by the fire alarm or signaling system. Where the emergency control function is not being tested concurrent with the fire alarm or signaling system testing, measurement of the emergency control function interface device output should be verified using the proper test devices. This might require reading or observing the condition of a relay, a voltage measurement, or the use of another type of test instrument. Once testing is complete, verification that any disabled or disconnected interface devices have been restored to normal is essential, and this verification should be documented in the testing results. Testing of the emergency control functions themselves is outside of the scope of NFPA 72. A complete end-to-end test that demonstrates the performance of emergency control functions activated by the fire alarm or signaling system might be required by some other governing laws, codes, or standards, or the authority having jurisdiction. In that situation, other applicable installation standards and design documents, not NFPA 72, would address testing and performance of the emergency control functions. NFPA 4 provides requirements for integrated (end-to-end) system testing. It is important to note that the appropriate NFPA standard would provide the acceptance criteria for the overall emergency control function operation requirements, including performance and test methods, while NFPA 72 covers the required performance and testing of the emergency function interface device. For instance, if an end-to-end test for a building with an engineered smoke control system is required by some other governing laws, codes, standards, or the authority having jurisdiction, the test protocol would have unique criteria for the smoke control system design, and a special inspector would be responsible for the overall operation and performance of the smoke control system in accordance with the appropriate standard (NFPA 92 and NFPA101) during the testing, including measuring pressure differentials and ensuring proper fan and damper operation. Refer to the following extract from NFPA 101 on smoke control: 9.3.2 System Designer. The engineer of record shall clearly identify the intent of the system, the design method used, the appropriateness of the method used, and the required means of inspecting, testing, and maintaining the system. [101: 9.3.2] 9.3.3 Acceptance Testing. Acceptance testing shall be performed by a special inspector in accordance with Section 9.13. [101: 9.3.3] Even though the fire alarm or signaling system initiating device might activate the smoke control system, the actual testing of the dampers and fan operation would be as required by the smoke control design and not part of the fire alarm or signaling system.	
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(g) Squibb release circuit – Use AGI flashbulb or other test light approved by the manufacturer. Verify operation of flashbulb or light.	PA 4099
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(h) Verified, sequential, or counting zone circuit – Operate required sensors at a minimum of four locations in circuit. Verify correct sequence with both the first and second detector in alarm.	PA 4099
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(i) All above devices or circuits or combinations thereof - Verify supervision of circuits by creating an open circuit.	PA 4099

C20. Mass Notification System — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(18)	Annually	(a) Monitored for integrity – Verify a system normal condition. (1) Control equipment (i) Fuses (ii) Interfaces (iii) Lamps/LED (iv) Primary (main) power supply (2) Secondary power batteries (3) Initiating devices (4) Notification appliances	PA 4097
NFPA 72 2016 Table 14.4.3.1(30)	SemiAnnually	(b) Not monitored for integrity; installed prior to adoption of the 2010 edition – Verify a system normal condition. (1) Control equipment (i) Fuses (ii) Interfaces (iii) Lamps/LED (iv) Primary (main) power supply (2) Secondary power batteries (3) Initiating devices (4) Notification appliances	PA 4097
NFPA 72 2016 Table 14.4.3.1(30)	Annually	(c) Antenna – Verify location and condition.	PA 4097
NFPA 72 2016 Table 14.4.3.1(30)	Annually	(d) Transceivers – Verify location and condition.	PA 4097

C21. Mass Notification System — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(a) Functions – At a minimum, test control equipment 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.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(b) Fuses – Verify the rating and supervision.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(c) Interfaced equipment – 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.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(d) Lamps and LEDs – Illuminate lamps and LEDs.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(e) Primary (main) power supply – 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.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(f) Audible textual notification appliances (speakers and other appliances to convey voice messages) – Measure sound pressure level with a sound level meter meeting ANSI S1.4a, *Specifications for Sound Level Meters,* Type 2 requirements. Measure and record levels throughout protected area. Set the sound level meter in accordance with ANSI S3.41, *American National Standard Audible Evacuation Signal,* 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.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(g) Visible – Perform test in accordance with manufacturer's published instructions. Verify appliance locations to be per approved layout and confirm that no floor plan changes affect the approved layout. Verify that the candela rating marking agrees with the approved drawing. Confirm that each appliance flashes.	PA 4097

NFPA 72 2016 Table 14.4.3.2(30)	Annually	(h) Control unit functions and no diagnostic failures are indicated – 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.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(i) Control unit reset – Power down the central control unit computer and restart it.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(j) Control unit security – If remote control software is loaded onto the system, verify that it is disabled to prevent unauthorized system access.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(k) Audible/visible functional test – 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.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(l) Software backup – Make full system software backup. Rotate backups based on accepted practice at site.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(m) Secondary power test – Disconnect ac power. Verify the ac power failure alarm status on central control equipment. With ac power disconnected, verify battery voltage under load.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(n) Wireless signals – Check forward/reflected radio power is within specifications.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(o) Antenna – Check forward/reflected radio power is within specifications. Verify solid electrical connections with no observable corrosion.	PA 4097
NFPA 72 2016 Table 14.4.3.2(30)	Annually	(p) Transceivers – Verify proper operation and mounting is not compromised.	PA 4097

D. Batteries – Fire Alarm Systems

D1. Batteries — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(9)		Inspect for corrosion or leakage. Verify tightness of connections. Verify marking of the month/year of manufacture (all types).	
NFPA 72 2016 Table 14.3.1(9)	Monthly	(a) Lead-acid – Visually inspect electrolyte level.	PA 4100
NFPA 72 2016 Table 14.3.1(9)	SemiAnnually	(b) Nickel-cadmium	PA 4100
NFPA 72 2016 Table 14.3.1(9)	Monthly	(c) Primary (dry cell)	PA 4100
NFPA 72 2016 Table 14.3.1(9)	SemiAnnually	(d) Sealed lead-acid	PA 4100

D2. Batteries (Lead-acid Type) — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(9)		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.	
NFPA 72 2016 Table 14.4.3.2(9)	Annually	(a)(1) Battery replacement – Replace batteries in accordance with the recommendations of the alarm equipment manufacturer or when the recharged battery voltage or current falls below the manufacturer's recommendations.	PA 4100

NFPA 72 2016 Table 14.4.3.2(9)	Annually	(a)(2) Charger test – With the batteries fully charged and connected to the charger, measure the voltage across the batteries with a voltmeter. Verify the voltage is 2.30 volts per cell ±0.02 volts at 77°F (25°C) or as specified by the equipment manufacturer.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	Annually	(a)(3) Discharge test – With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	Semiannually	(a)(4) Load voltage test – With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery. Verify the battery does not fall below 2.05 volts per cell under load.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	Semiannually	(a)(5) Specific gravity – Measure as required the specific gravity of the liquid in the pilot cell or all of the cells. Verify the specific gravity is within the range specified by the manufacturer. Although the specified specific gravity varies from manufacturer to manufacturer, a range of 1.205–1.220 is typical for regular lead-acid batteries, while 1.240–1.260 is typical for high-performance batteries. Do not use a hydrometer that shows only a pass or fail condition of the battery and does not indicate the specific gravity, because such a reading does not give a true indication of the battery condition.	PA 4100

D3. Batteries (Nickel-Cadmium type) Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(9)		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.	
NFPA 72 2016 Table 14.4.3.2(9)	NJ NYS Annually	(b)(1) Battery replacement – Replace batteries in accordance with the recommendations of the alarm equipment manufacturer or when the recharged battery voltage or current falls below the manufacturer's recommendations.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	Annually	(b)(2) Charger test [d] – With the batteries fully charged and connected to the charger, place an ampere meter in series with the battery under charge. Verify the charging current is in accordance with the manufacturer's recommendations for the type of battery used. In the absence of specific information, use 1⁄30 to 1⁄25 of the battery rating. Note [d] – Example: 4000 mAh × 1⁄25 = 160 mA charging current at 77°F (25°C).	PA 4100
NFPA 72 2010 Table 14.4.5(6)	NYC Annually	(b)(2) – Discharge test (30 minutes)	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	NJ NYS Annually	(b)(3) Discharge test – With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	SemiAnnually	(b)(4) Load voltage test – With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery. Verify the float voltage for the entire battery is 1.42 volts per cell, nominal, under load. If possible, measure cells individually.	PA 4100

D4. Batteries (Primary Battery) Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2010 Table 14.4.2.2(6)	NYC Monthly	(a) Primary battery load voltage test – The maximum load for a No. 6 primary battery shall not be more than 2 amperes per cell. An individual (1.5 volt) cell shall be replaced when a load of 1 ohm reduces the voltage below 1 volt. A 6–volt assembly shall be replaced when a test load of 4 ohms reduces the voltage below 4 volts.	PA 4100
NFPA 72 2010 Table 14.4.5(6)(c)	NYC Monthly	(1) Age test	

D5. Batteries (Sealed lead-acid type) — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(9)	Annually	(c) Sealed lead-acid type (1) Battery replacement – Replace batteries in accordance with the recommendations of the alarm equipment manufacturer or when the recharged battery voltage or current falls below the manufacturer's recommendations.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	Annually	(c) Sealed lead-acid type (2) Charger test – With the batteries fully charged and connected to the charger, measure the voltage across the batteries with a voltmeter. Verify the voltage is 2.30 volts per cell ±0.02 volts at 77°F (25°C) or as specified by the equipment manufacturer.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	Annually	(c) Sealed lead-acid type (3) Discharge test – With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery.	PA 4100
NFPA 72 2016 Table 14.4.3.2(9)	SemiAnnually	(c) Sealed lead-acid type (4) Load voltage test – Verify the battery performs under load, in accordance with the battery manufacturer's specifications.	PA 4100

E. Control Equipment

E1. Control Equipment: Fire Alarm Systems Un-Monitored for Alarm, Supervisory, and Trouble Signals — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(2)	Weekly	Control equipment: Verify a system normal condition. (1) Fuses (2) Interfaced equipment (3) Lamps and LEDs (4) Primary (main) power supply (5) Trouble signals	PA 4101

E2. Control Equipment: Fire Alarm Systems Monitored for Alarm, Supervisory, and Trouble Signals — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(2)	Annually	Control equipment: Verify a system normal condition (1) Fuses (2) Interfaced equipment (3) Lamps and LEDs (4) Primary (main) power supply	PA 4101

NFPA 72 2016 Table 14.3.1(2)(a)	Semiannual	Control equipment: Verify a system normal condition (5) Trouble signals	PA 4101

E3. Control Equipment and Transponder Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(2)	Annually	(a) Functions 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.	PA 4101
NFPA 72 2016 Table 14.4.3.2(2)	Annually	(b) Fuses Verify rating and supervision.	PA 4101
NFPA 72 2016 Table 14.4.3.2(2)	Annually	(c) Interfaced equipment 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.	PA 4101
NFPA 72 2016 Table 14.4.3.2(2)	Annually	(d) Lamps and LEDs Illuminate lamps and LEDs.	PA 4101
NFPA 72 2016 Table 14.4.3.2(2)	Annually	(e) Primary (main) power supply Test under maximum load, including all alarm appliances requiring simultaneous operation. Test redundant power supplies separately.	PA 4101

E4. Fire Alarm Control Unit Trouble Signals Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(3)	Annually	(a) Audible and visual Verify operation of control unit trouble signals. Verify ring-back feature for systems using a trouble-silencing switch that requires resetting.	PA 4101
NFPA 72 2016 Table 14.4.3.2(3)	Annually	(b) Disconnect switches 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.	PA 4101
NFPA 72 2016 Table 14.4.3.2(3)	Annually	(c) Ground-fault monitoring circuit If the system has a ground detection feature, verify the occurrence of ground-fault indication whenever any installation conductor is grounded.	PA 4101
NFPA 72 2016 Table 14.4.3.2(3)	Annually	(d) Transmission of signals to off-premises location Actuate an initiating device and verify receipt of alarm signal at the off-premises location. Create a trouble condition and verify receipt of a trouble signal at the off-premises location. Actuate a supervisory device and verify receipt of a supervisory signal at the off-premises location. If a transmission carrier is capable of operation under a single- or multiple-fault condition, activate an initiating device during such fault condition and verify receipt of an alarm signal and a trouble signal at the off-premises location.	PA 4101

E5. Remote Annunciators — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(11)	SemiAnnually	Verify location and condition.	PA 4102
NFPA 72 2016 Table 14.4.3.2(11)	Annual	Verify the correct operation and identification of annunciators. If provided, verify the correct operation of annunciator under a fault condition.	PA 4102

E6. Fire Alarm Control Interface and Emergency Control Function Interface — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(20)	SemiAnnually	Verify location and condition.	PA 4102

E7. Fire Alarm Control Interface and Emergency Control Function Interface — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(20)	See 14.4.4.4	Interface equipment [m] 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. Note [m] – 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 panel, it is not necessary to test for phase reversal four times a year.	PA 4102
NFPA 72 2016 14.4.4.4		Test frequency of interfaced equipment shall be the same as specified by the applicable NFPA standards for the equipment being supervised.	
NFPA 72 2016 14.2.7		Interface Equipment and Emergency Control Functions.	
NFPA 72 2016 14.2.7.1*		Testing personnel shall be qualified and experienced in the arrangement and operation of interface equipment and emergency control functions.	
NFPA 72 2016 A.14.2.7.1		As an example, testing of the elevator fire service and shutdown functions will usually require a coordinated multi-discipline effort with presence of qualified service personnel for the fire alarm system, the elevator system, and other building systems. The presence of inspection authorities might also be needed in some jurisdictions. The development of a test plan should be considered to ensure that the testing of these features is accomplished in a coordinated and timely manner. This plan should also ensure that all appropriate parties and personnel are present when needed, and that the testing requirements for both the fire alarm system and the elevator system are fulfilled. See Section 21.3 and Section 21.4 for specific elevator emergency control functions.	

E8. Fiber-Optic Cable Connections — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(16)	Annual	Verify location and condition.	PA 4102

E9. Fiber-Optic Cable Power — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(16)	N/A	Conductors—nonmetallic (a) Fiber optics Test the fiber-optic transmission line by the use of an optical power meter or by 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-C.3, Optical Fiber Cabling Components Standard, related to fiber-optic lines and connection/splice losses and the control unit manufacturer's published specifications.	

E10. Supervising Station Fire Alarm Systems – Transmitters — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(4)	Annually	Verify location, physical condition, and a system normal condition. (a) Digital alarm communicator transmitter (DACT) (b) Digital alarm radio transmitter (DART) (c) McCulloh (d) Radio alarm transmitter (RAT) (e) All other types of communicators	PA 4105

E11. Supervising Station Fire Alarm Systems – Transmitters — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(4)	Annually	(a) All equipment 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] Note [a] – Some transmission equipment (such as but not limited to 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. 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.	PA 4103

NFPA 72 2016 Table 14.4.3.2(4)	Annually	(b) Digital alarm communicator transmitter (DACT) Except for DACTs installed prior to adoption of the 2013 edition of NFPA 72 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. 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 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, 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 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, 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 communication path by the DACT to complete the transmission to the DACR.	PA 4103
NFPA 72 2016 Table 14.4.3.2(4)	Annually	(c) Digital alarm radio transmitter (DART) Disconnect the primary telephone line. Verify transmission of a trouble signal to the supervising station by the DART occurs within 4 minutes.	PA 4103
NFPA 72 2016 Table 14.4.3.2(4)	Annually	(d) McCulloh transmitter 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 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	PA 4103
NFPA 72 2016 Table 14.4.3.2(4)	Annually	(e) Radio alarm transmitter (RAT) 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.	PA 4103
NFPA 72 2016 Table 14.4.3.2(4)	Annually	(f) Performance-based technologies Perform tests to ensure the monitoring of integrity of the transmission technology and technology path. Where shared communications equipment is used as permitted by 26.6.3.1.14, provided 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]	PA 4103

		Note [b] – The automatic transmission of the check-in (handshake) signal can take up to 60 minutes to occur. Verify the premises unit annunciates the failure within 200 seconds of the transmission failure. Restore the communication path. Where multiple communication paths are used, disconnect both 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 communication paths.	

E12. Supervising Station Fire Alarm Systems — Receivers — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.3.1(27)	Daily	(a) Signal receipt Verify receipt of signal.	PA 4105
NFPA 72 2016 Table 14.3.1(27)	Annual	(b) Receivers Verify location and normal condition.	PA 4105

E13. Supervising Station Fire Alarm Systems — Receiving Equipment — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(27)	Monthly	(a) All equipment 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.	PA 4104
NFPA 72 2016 Table 14.4.3.2(27)	Monthly	(b) Digital alarm communicator receiver (DACR) 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 NFPA 72). Verify receipt of these signals.	PA 4104
NFPA 72 2016 Table 14.4.3.2(27)	Monthly	(c) Digital alarm radio receiver (DARR) 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	PA 4104
NFPA 72 2016 Table 14.4.3.2(27)	Monthly	(d) McCulloh systems Test and record the current on each circuit at each supervising and subsidiary station under the following conditions: (1) During functional operation	PA 4104

		(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. 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	
NFPA 72 2016 Table 14.4.3.2(27)	Monthly	(e) Radio alarm supervising station receiver (RASSR) and radio alarm repeater station receiver (RARSR) 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	PA 4104
NFPA 72 2016 Table 14.4.3.2(27)	Monthly	(f) Private microwave radio systems 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	PA 4104
NFPA 72 2016 Table 14.4.3.2(27)	Monthly	(g) Performance-based technologies 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 NFPA 72). Restore the communication path. Where multiple communication paths are used, disconnect both communication paths and confirm that failure of the path 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 NFPA 72). Restore both communication paths.	PA 4104

E14. Low-Power Radio – Wireless Systems — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 72 2016 Table 14.4.3.2(29)	Monthly	(3) Check batteries for all components in the system monthly unless the control unit checks all batteries and all components daily.	PA 4105
NFPA 72 2016 Table 14.4.3.2(29)	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. 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.	

FIRE DETECTION AND ALARM SYSTEMS
GENERAL INFORMATION – FIRE ALARM CONTROL PANELS

PA 4085 / 12-20

Building ID: **FACP ID:**

Date: **Original Installation Date:**

Fire Alarm Panels

Fire Alarm Panel - Make/Model/Manufacturer: _____

Fire Alarm Panel – Location: _____

Signals Transmitted to: _____

Emergency Power provided by: _____

Identify Number and Location of SubPanels, Nodes, DGPs, Annunciator panels, Smoke Management panels, Fire Suppression Releasing panels, etc., connected to this fire alarm panel. Provide unique identifier for each. Attach additional documentation as needed.

Alarm Notification Devices

Total number of Audible Notification Devices: _____

Total number of Visual Notification Devices: _____

Alarm Initiating Devices

Total number of Smoke Detection Devices: _____

Total number of Heat Detection Devices: _____

Total number of Manual Pull Stations: _____

Number of Water Flow Alarm Signals: _____

Number of Tamper Switch signals: _____

Number of Supervisory Signals: _____

Number/Description of Other Alarm Initiating Devices: _____

Special Functions

Provide information regarding special functions operated through or connected to the fire alarm panel including but not limited to:

Smoke Purge / Smoke Management Systems	Releasing Devices i.e. Electromagnetic Locks, Electric Strike Locks, Door Hold Open Devices, etc.
Emergency Voice/Alarm Communications Systems	Fire Suppression System Activation i.e., FM200 systems, Deluge Sprinkler Systems, Dry Chemical Extinguishing Systems, etc.

Attach additional documentation as needed.

Notes:

FIRE DETECTION AND ALARM SYSTEMS
GENERAL INFORMATION – ALARM INITIATING DEVICES

PA 4086 / 12-20

Building ID: **FACP ID:**

Date: **Total Number of Alarm Initiating Devices:**

1. Device Identification - Provide unique identifier for each Alarm Initiating Device
2. Provide location of Alarm Initiating Device
3. Identify Type of Alarm Initiating Device i.e., Smoke Detector, Manual Pull Station, Sprinkler Water Flow Alarm, Clean Agent Discharge, etc.
4. Provide Date Alarm Initiating Device was installed.
5. Provide any other information in Notes.

Device ID	Location	Type of Alarm Initiating Device	Date Installed	Notes

FIRE DETECTION AND ALARM SYSTEMS
GENERAL INFORMATION – ALARM NOTIFICATION DEVICES

PA 4087 / 12-20

Building ID: **FACP ID:**

Date: **Total Number of Alarm Notification Devices:**

1. Device Identification - Provide unique identifier for each Alarm Notification Device
2. Provide location of Alarm Notification Device
3. Identify Type of Alarm Notification Device i.e., Horn, Bell, Horn/Strobe, Strobe, Voice Speaker
4. Provide Date Alarm Notification Device was installed.
5. Provide any other information in Notes.

Device ID	Location	Type of Alarm Notification Device	Date Installed	Notes

THE PORT AUTHORITY OF NY & NJ

FIRE DETECTION AND ALARM SYSTEMS
ALARM NOTIFICATION APPLIANCES – INSPECTION / TESTING

PA 4088 / 12-20

Building ID:

- Use this form to document inspection and testing of alarm notification appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Alarm Notification Appliances – Inspection – SemiAnnually – {Reference C11B1} –** Verify location and condition (all appliances).
   - Audible appliances
   - Audible textual notification appliances
   - Visible appliances

2. **Alarm Notification Appliances – Testing – Annually – {Reference C11B2} – Audible appliances –** Verify the operation of the notification appliances. Measure sound pressure levels for signals with a sound level meter. Record the measurement in Notes.

3. **Alarm Notification Appliances – Testing – Annually – {Reference C11B2} – Audible textual notification appliances (speakers and other appliances to convey voice messages) –** Verify the operation of the notification appliances. Measure sound pressure levels for signals with a sound level meter. Record the measurement in Notes. Audible information shall be verified to be distinguishable and understandable.

4. **Alarm Notification Appliances – Testing – Annually – {Reference C11B2} – Visible appliances –** Verify that each appliance flashes.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4089 / 12-20

ALARM INITIATING DEVICES – INSPECTION / TESTING
AIR SAMPLING / DUCT DETECTORS

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Air Sampling – SemiAnnually – {Reference C11C1} –** Verify that in-line filters, if any, are clean.

2. **Initiation Devices – Testing – Air Sampling – Annually – {Reference C11C3} –** Test with smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. Test from the end sampling port or point on each pipe run. Verify airflow through all other ports or points.

3. **Initiation Devices – Inspection – Duct Detectors – SemiAnnually – {Reference C11C1} –** 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.

4. **Initiation Devices – Inspection – Duct Detectors –Annually – {Reference C11C1} –** Sampling tube – Verify proper orientation. Confirm the sampling tube protrudes into the duct in accordance with system design.

5. **Initiation Devices – Testing – Duct Detectors – Annually – {Reference C11C3} –** Test smoke detectors in place to ensure smoke entry into the sensing chamber and an alarm response. Use smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. 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.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4090 / 12-20

ALARM INITIATING DEVICES – INSPECTION / TESTING
ELECTROMECHANICAL RELEASING DEVICES
FIRE EXTINGUISHING SYSTEM(S) OR SUPPRESSION SYSTEM(S) SWITCHES

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Electromechanical releasing devices – SemiAnnually – {Reference C11C1} -** Conduct visual inspections to assure that there are no changes that affect equipment performance.

2. **Initiation Devices – Testing – Electromechanical releasing devices – Annually – {Reference C11C7} –** Nonrestorable-type link – Verify correct operation by removal of the fusible link and operation of the associated device. Lubricate any moving parts as necessary.

3. **Initiation Devices – Testing – Electromechanical releasing devices – Annually – {Reference C11C7} –**Restorable-type link – Verify correct operation by removal of the fusible link and operation of the associated device. Lubricate any moving parts as necessary.

4. **Initiation Devices – Inspection – Fire extinguishing system(s) or suppression system(s) switches – SemiAnnually – {Reference C11C1} –** 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.

5. **Initiation Devices – Testing – Fire extinguishing system(s) or suppression system(s) switches – Annually – {Reference C11C8} –** Operate the switch mechanically or electrically and verify receipt of signal by the fire alarm control unit.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS
PA 4091 / 12-20

ALARM INITIATING DEVICES – INSPECTION / TESTING
HEAT DETECTORS

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Heat detectors – SemiAnnually – {Reference C11C1} –** Conduct visual inspections to assure that there are no changes that affect equipment performance.

2. **Initiation Devices – Testing – Heat detectors – Annually – {Reference C11C10} –** Fixed-temperature, rate-of-rise, rate of compensation, restorable line, spot type (excluding pneumatic tube type) – Perform heat test with a listed and labeled heat source or in accordance with the manufacturer's published instructions. Two or more detectors shall be tested on each initiating circuit annually. Different detectors shall be tested each year. Within 5 years, each detector shall have been tested.

3. **Initiation Devices – Testing – Heat detectors – Annually – {Reference C11C10}** – Fixed-temperature, nonrestorable line type – Do not perform heat test. Test functionality mechanically and electrically. Measure and record loop resistance. Investigate changes from acceptance test.

4. **Initiation Devices – Testing – Heat detectors – Annually – {Reference C11C10} –** Fixed-temperature, nonrestorable spot type – Do not perform heat tests. Test functionality mechanically and electrically. After 15 years from initial installation, replace all devices or have 2 detectors per 100 laboratory tested. Replace the 2 detectors with new devices.

5. **Initiation Devices – Testing – Heat detectors – Annually – {Reference C11C10} –** Restorable line type, pneumatic tube only – 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.

6. **Initiation Devices – Testing – Heat detectors – Annually – {Reference C11C10}** – Single- and multiple-station heat alarms – Conduct functional tests according to manufacturer's published instructions. Do not test nonrestorable heat detectors with heat.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4092 / 12-20

ALARM INITIATING APPLIANCES – INSPECTION / TESTING
SMOKE AND FIRE DETECTORS

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Radiant energy fire detectors – Quarterly – {Reference C11C1} –** Verify no point requiring detection is obstructed or outside the detector's field of view.

2. **Initiation Devices – Testing – Radiant energy fire detectors – SemiAnnually – {Reference C11C13} –** Test flame detectors and spark/ember detectors in accordance with the manufacturer's published instructions to determine that each detector is operative.

3. **Initiation Devices – Inspection – Video image smoke and fire detectors – Quarterly – {Reference C11C1} –** Verify no point requiring detection is obstructed or outside the detector's field of view.

4. **Initiation Devices – Testing – Fire/Gas and Other Detectors – Annually – {Reference C11C9} –** Test fire–gas detectors and other fire detectors as prescribed by the manufacturer and as necessary for the application.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS
PA 4093 / 12-20

ALARM INITIATING APPLIANCES – INSPECTION / TESTING
SMOKE DETECTORS

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information including documentation of deficiencies identified, date corrected, and who performed the work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Smoke detectors – SemiAnnually – {Reference C11C1} –** Conduct visual inspections to assure that there are no changes that affect equipment performance.
2. **Initiation Devices – Testing – Smoke detectors – Annually – {Reference C11C3} –** Test smoke detectors in place to ensure smoke entry into the sensing chamber and an alarm response. 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, into the sensing chamber can be used.
3. **Initiation Devices – Testing – Smoke detectors – Annually – {Reference C11C3} –** Single- and multiple-station smoke alarms connected to protected premises systems – 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 and verifying that the protected premises system receives a supervisory signal and does not cause a fire alarm signal.
4. **Initiation Devices – Testing – Smoke detectors – Annually – {Reference C11C3} –** Smoke detector with built-in thermal element – Operate both portions of the detector independently as described for the respective devices.
5. **Initiation Devices – Testing – Smoke detectors – Annually – {Reference C11C3} –** Smoke detectors with control output functions – 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.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4094 / 12-20

ALARM INITIATING APPLIANCES – INSPECTION / TESTING
MANUAL FIRE ALARM BOXES / PROJECTED BEAM SMOKE DETECTORS

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Manual Fire Alarm Boxes – SemiAnnually – {Reference C11C1} –** Conduct visual inspections to assure that there are no changes that affect equipment performance.

2. **Initiation Devices – Testing – Fire Alarm Boxes – Annually – {Reference C11C12} –** Manual fire alarm boxes – Operate manual fire alarm boxes per the manufacturer's published instructions. Test both key-operated presignal and general alarm manual fire alarm boxes.

3. **Initiation Devices – Inspection – Projected Beam Smoke Detectors – SemiAnnually – {Reference C11C1} –** Verify beam path is unobstructed.

4. **Initiation Devices – Testing – Projected Beam Smoke Detectors – Annually – {Reference C11C3} –** Projected beam type – Test the detector by introducing smoke, other aerosol, or an optical filter into the beam path.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS
PA 4095 / 12-20

ALARM INITIATING APPLIANCES – INSPECTION/TESTING
SUPERVISORY SIGNAL DEVICES / WATERFLOW DEVICES

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Supervisory Signal Devices – Quarterly – {Reference C11C1} –** Conduct visual inspections to assure that there are no changes that affect equipment performance.

2. **Initiation Devices – Testing – Supervisory Signal Devices – Quarterly/SemiAnnually/Annually – {Reference C11C14} –** As per jurisdictional requirements, operate all supervisory signaling devices including but not limited to control valve switches, high and low air pressure switches, room temperature switches, water temperature and level switches, and other initiating devices that generate supervisory signals. Identify the type of device in Notes.

3. **Initiation Devices – Inspection – Waterflow Devices – Quarterly – {Reference C11C1} –** Conduct visual inspections to assure that there are no changes that affect equipment performance.

4. **Initiation Devices – Testing – Waterflow Devices – SemiAnnually – {Reference C11C15} –** Mechanical, electrosonic, or pressure-type waterflow device – Water shall be flowed 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 for wet-pipe systems, or an alarm test bypass connection for dry-pipe, pre-action, or deluge systems in accordance with NFPA 25.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4096 / 12-20

ALARM INITIATING APPLIANCES – INSPECTION / TESTING
CARBON MONOXIDE/MULTI SENSOR DETECTORS
SMOKE DETECTOR SENSITIVITY TESTING

Building ID:

- Use this form to document inspection and testing of alarm initiating appliances.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Initiation Devices – Inspection – Carbon Monoxide Detectors – SemiAnnually – {Reference C11C5} –** Verify location and condition (all types).

2. **Initiation Devices – Testing – Carbon Monoxide Detectors – Annually – {Reference C11C6} –** 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 their published instructions.

3. **Initiation Devices – Testing – Multi-Sensor Fire Detector or Multi-Criteria Fire Detector or Combination Fire Detector – Annually – {Reference C11C11}** – Test each of the detection principles 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. Also test each detector in accordance with the published manufacturer's instructions.

4. **Initiation Devices – Testing – Smoke Detector Sensitivity – 1 Year after installation, Every other year thereafter – {Reference C11C4} –** In other than one- and two-family dwellings, perform tests to ensure that each smoke detector is within its listed and marked sensitivity range.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

THE PORT AUTHORITY OF NY & NJ

FIRE DETECTION AND ALARM SYSTEMS
MASS NOTIFICATION SYSTEMS – INSPECTION / TESTING

PA 4097 / 12-20

Building ID:

- Use this form to document inspection and testing of mass notification systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Mass Notification System – Inspection – Monitored for Integrity – Annually – {Reference C11C20} –** Verify a system normal condition to include: control equipment, secondary power batteries, initiating devices, and notification appliances.

2. **Mass Notification System – Inspection – Not Monitored for Integrity; installed prior to adoption of the NFPA 72 2010 edition – SemiAnnually – {Reference C11C20} –** Verify a system normal condition to include: control equipment, secondary power batteries, initiating devices, and notification appliances.

3. **Mass Notification System – Inspection – Antenna – Annually – {Reference C11C20}** – Verify location and condition.

4. **Mass Notification System – Inspection – Transceivers – Annually – {Reference C11C20} –** Verify location and condition.

5. **Mass Notification System – Testing – Annually – {Reference C11C21} –** Test all components listed below as identified in the Reference. Provide details of testing on the back of this form or attach additional documentation.

(a) Functions	(b) Fuses	(c) Interfaced equipment	(d) Lamps and LEDs
(e) Primary (main) power supply	(f) Audible textual notification appliances	(g) Visible	(h) Control unit functions and no diagnostic failures are indicated
(i) Control unit reset	(j) Control unit security	(k) Audible/visible functional test	(l) Software backup
(m) Secondary power test	(n) Wireless signals	(o) Antenna	(p) Transceivers

S = Satisfactory **U = Unsatisfactory**

System ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4098 / 12-20

ALARM INITIATING APPLIANCES – INSPECTION / TESTING
EMERGENCY VOICE / ALARM COMMUNICATIONS EQUIPMENT
SPECIAL PROCEDURES

Building ID:

- Use this form to document testing of alarm initiating appliances and systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Emergency Voice / Alarm Communications Equipment – Inspection – SemiAnnually – {Reference C11C16} –** In-building fire emergency voice/alarm communications equipment – Verify location and condition.

2. **Emergency Communications Equipment – Testing –Annually – {Reference C11C17} –** Test the following components as identified in the Reference:

(a) Amplifier/tone generators – Verify correct switching and operation of backup equipment.	(b) Call-in signal silence – Operate/function and verify receipt of correct visual and audible signals at control unit.	(c) Off-hook indicator (ring down) – Install phone set or remove phone from hook and verify receipt of signal at control unit.
(d) Phone jacks – Visually inspect phone jack and initiate communications path through jack.	(e) Phone set – Activate each phone set and verify correct operation.	(f) System performance – Operate the system with a minimum of any five handsets simultaneously. Verify voice quality and clarity.

3. **Special Procedures – Testing – Alarm Verification – Annually – {Reference C11C18} –** Verify time delay and alarm response for smoke detector circuits identified as having alarm verification.

4. **Special Procedures – Testing – Multiplex Systems – Annually – {Reference C11C18}**
   - 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 redundant central control equipment is provided, verify switchover and all required functions and operations of secondary control equipment.
   - Verify all system functions and features in accordance with manufacturer's published instructions.

S = Satisfactory **U = Unsatisfactory**

Device ID / System ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS
ALARM INITIATING APPLIANCES – INSPECTION / TESTING
SPECIAL HAZARD EQUIPMENT

PA 4099 / 12-20

Building ID:

- Use this form to document testing of special hazard equipment.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Special Hazard Equipment – Testing – Annually – {Reference C11C19} –** Test system and components as identified:

(a) Abort switch (dead-man type) – Operate abort switch and verify correct sequence and operation.	(b) Abort switch (recycle type) – Operate abort switch and verify development of correct matrix with each sensor operated.	(c) Abort switch (special type) – Operate abort switch and verify correct sequence and operation in accordance with authority having jurisdiction. Observe sequencing as specified on as-built drawings or in system owner's manual.
(d) Cross-zone detection circuit – Operate one sensor or detector on each zone. Verify occurrence of correct sequence with operation of first zone and then with operation of second zone.	(e) Matrix-type circuit – Operate all sensors in system. Verify development of correct matrix with each sensor operated.	(f) Release solenoid circuit [k] – Verify operation of solenoid.
(g) Squibb release circuit – Use AGI flashbulb or other test light approved by the manufacturer. Verify operation of flashbulb or light.	(h) Verified, sequential, or counting zone circuit – Operate required sensors at a minimum of four locations in circuit. Verify correct sequence with both the first and second detector in alarm.	(i) All above devices or circuits or combinations thereof - Verify supervision of circuits by creating an open circuit.

2. **Initiating Devices – Supervisory Signals – Testing – Annually – {Reference C11C2} –** Initiating devices such as smoke detectors used for elevator recall, closing dampers, or releasing doors held in the open position to initiate supervisory signals at the fire alarm control unit (FACU) should be tested at the same frequency (annual) as those devices when they are generating an alarm signal. They are not supervisory devices, but they initiate a supervisory signal at the FACU.

S = Satisfactory **U = Unsatisfactory**

Device ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS
BATTERIES – INSPECTION / TESTING

PA 4100 / 12-20

Building ID: **FACP ID**

- Use this form to document inspection and testing of fire alarm system batteries.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Batteries – Inspection – Monthly/SemiAnnually – {Reference C11D1} –** Inspect for corrosion or leakage. Verify tightness of connections. Verify marking of the month/year of manufacture (all types).

Monthly	SemiAnnually
Lead-acid – Visually inspect electrolyte level.	Nickel-cadmium
Primary (dry cell)	Sealed lead-acid

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.

2. **Batteries – Testing –SemiAnnually/Annually – {Reference C11D2, C11D3, C11D5} –** Review details of requirements in the referenced sections.

Battery	Battery replacement	Charger test	Discharge test	Load voltage test
Lead-acid Type	Annually	Annually	Annually	Semiannually
Nickel-Cadmium type	Annually	Annually	Annually	Semiannually
Sealed lead-acid type	Annually	Annually	Annually	Semiannually

3. **Batteries – Testing – Primary Battery - Monthly – {Reference C11D4} –** Primary battery load voltage test – The maximum load for a No. 6 primary battery shall not be more than 2 amperes per cell. An individual (1.5 volt) cell shall be replaced when a load of 1 ohm reduces the voltage below 1 volt. A 6–volt assembly shall be replaced when a test load of 4 ohms reduces the voltage below 4 volts.

4. **Batteries – Testing – Lead Acid Type – SemiAnnually – {Reference C11D2} –** Specific gravity – Measure as required the specific gravity of the liquid in the pilot cell or all of the cells. Verify the specific gravity is within the range specified by the manufacturer. Although the specified specific gravity varies from manufacturer to manufacturer, a range of 1.205–1.220 is typical for regular lead-acid batteries, while 1.240–1.260 is typical for high-performance batteries. Do not use a hydrometer that shows only a pass or fail condition of the battery and does not indicate the specific gravity, because such a reading does not give a true indication of the battery condition.

S = Satisfactory **U = Unsatisfactory**

System ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS
CONTROL EQUIPMENT – INSPECTION / TESTING

PA 4101 / 12-20

Building ID: **FACP ID**

- Use this form to document inspection and testing of control equipment.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Control Equipment – Inspection – Weekly/SemiAnnually/Annually – {Reference C11E1, C11E2} – Verify a system normal condition.

1. Fuses	2. Interfaced equipment	3. Lamps and LEDs
4. Primary (main) power supply	5. Trouble signals	

2. Control Equipment and Transponder – Testing – Annually – {Reference C11E3}

(a) Functions – 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.	(b) Fuses – Verify rating and supervision
(c) Interfaced equipment – 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.	(d) Lamps and LEDs – Illuminate lamps and LEDs.
(e) Primary (main) power supply – Test under maximum load, including all alarm appliances requiring simultaneous operation. Test redundant power supplies separately.	

3. Fire Alarm Control Unit Trouble Signals – Testing – Annually – {Reference C11E3}

(a) Audible and visual Verify operation of control unit trouble signals. Verify ring-back feature for systems using a trouble-silencing switch that requires resetting.	(b) Disconnect switches 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.
(c) Ground-fault monitoring circuit If the system has a ground detection feature, verify the occurrence of ground-fault indication whenever any installation conductor is grounded.	(d) Transmission of signals to off-premises location • Actuate an initiating device and verify receipt of alarm signal at the off-premises location. • Create a trouble condition and verify receipt of a trouble signal at the off-premises location. • Actuate a supervisory device and verify receipt of a supervisory signal at the off-premises location. If a transmission carrier is capable of operation under a single- or multiple-fault condition, activate an initiating device during such fault condition and verify receipt of an alarm signal and a trouble signal at the off-premises location.

S = Satisfactory **U = Unsatisfactory**

System ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS
INSPECTION / TESTING
REMOTE ANNUNCIATORS / CONTROL INTERFACES
FIBER-OPTIC CABLE CONNECTIONS

PA 4102 / 12-20

Building ID: **FACP ID**

- Use this form to document inspection and testing of remote annunciators, control interfaces, and fiber-optic cable connections.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Remote Annunciators – Inspection – SemiAnnually – {Reference C11E5} –** Verify location and condition.
2. **Remote Annunciators – Testing – Annually – {Reference C11E5} –** Verify the correct operation and identification of annunciators. If provided, verify the correct operation of annunciator under a fault condition.
3. **Fire Alarm Control Interface and Emergency Control Function Interface – Inspection –SemiAnnually – {Reference C11E6}** – Verify location and condition.
4. **Fire Alarm Control Interface and Emergency Control Function Interface – Testing – {Reference C11E7} –** 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.
5. **Fiber-Optic Cable Connections – Inspection – Annually – {Reference C11E8} -** Verify location and condition. Provide additional information defining the connection in Notes.

S = Satisfactory **U = Unsatisfactory**

System ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4103 / 12-20

INSPECTION / TESTING

SUPERVISING STATION FIRE ALARM SYSTEMS – TRANSMITTERS

Building ID: **FACP ID**

- Use this form to document testing of supervising station fire alarm system transmitters.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Supervising Station Fire Alarm Systems – Transmitters – Testing – Annually – {Reference C11E11} –** (a) All equipment – 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 NFPA 72 Chapter 26. 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.

2. **Supervising Station Fire Alarm Systems – Transmitters – Testing – Annually – {Reference C11E11} –** (b) Digital alarm communicator transmitter (DACT) – Except for DACTs installed prior to adoption of the 2013 edition of NFPA 72 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.

3. **Supervising Station Fire Alarm Systems – Transmitters – Testing – Annually – {Reference C11E11} –** (c) Digital alarm radio transmitter (DART) – Disconnect the primary telephone line. Verify transmission of a trouble signal to the supervising station by the DART occurs within 4 minutes.

4. **Supervising Station Fire Alarm Systems – Transmitters – Testing – Annually – {Reference C11E11} –** (d) McCulloh transmitter – Actuate initiating device. Verify production of not less than three complete rounds of not less than three signal impulses each by the McCulloh transmitter.

5. **Supervising Station Fire Alarm Systems – Transmitters – Testing – Annually – {Reference C11E11} –** (e) Radio alarm transmitter (RAT) – 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.

6. **Supervising Station Fire Alarm Systems – Transmitters – Testing – Annually – {Reference C11E11} –** (f) Performance-based technologies – Perform tests to ensure the monitoring of integrity of the transmission technology and technology path.

S = Satisfactory **U = Unsatisfactory**

System ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4104 / 12-20

INSPECTION / TESTING

SUPERVISING STATION FIRE ALARM SYSTEMS – RECEIVING EQUIPMENT

Building ID:

- Use this form to document testing of supervising station fire alarm system receiving equipment.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Supervising Station Fire Alarm Systems – Receiving Equipment – Testing – Monthly – {Reference C11E13} –** (a) All equipment – 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.

2. **Supervising Station Fire Alarm Systems – Receiving Equipment – Testing – Monthly – {Reference C11E13} –** (b) Digital alarm communicator receiver (DACR) – Disconnect each transmission means in turn from the DACR, and verify audible and visual annunciation of a trouble signal in the supervising station.

3. **Supervising Station Fire Alarm Systems – Receiving Equipment – Testing – Monthly – {Reference C11E13} –** (c) Digital alarm radio receiver (DARR) – Cause conditions of all DARRs on all subsidiary and repeater station receiving equipment. Verify receipt at the supervising station of correct signals.

4. **Supervising Station Fire Alarm Systems – Receiving Equipment – Testing – Monthly – {Reference C11E13} –** (d) McCulloh systems – Test and record the current on each circuit at each supervising and subsidiary station.

5. **Supervising Station Fire Alarm Systems – Receiving Equipment – Testing – Monthly – {Reference C11E13} –** (e) Radio alarm supervising station receiver (RASSR) and radio alarm repeater station receiver (RARSR) – Cause conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals.

6. **Supervising Station Fire Alarm Systems – Receiving Equipment – Testing – Monthly – {Reference C11E13}** – (f) Private microwave radio systems – Cause conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals.

7. **Supervising Station Fire Alarm Systems – Receiving Equipment – Testing – Monthly – {Reference C11E13} –** (g) Performance-based technologies – Perform tests to ensure the monitoring of integrity of the transmission technology and technology path.

S = Satisfactory **U = Unsatisfactory**

System ID	Date	Inspector	Task/Result	Notes

FIRE DETECTION AND ALARM SYSTEMS

PA 4105 / 12-20

INSPECTION / TESTING
SUPERVISING STATION FIRE ALARM SYSTEMS
LOW-POWER RADIO – WIRELESS SYSTEMS

Building ID:

- Use this form to document inspection and testing of supervising station fire alarm systems and low power radio wireless systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Supervising Station Fire Alarm Systems – Transmitters – Inspection – Annually – {Reference C11E10} –** Verify location, physical condition, and a system normal condition.
   (a) Digital alarm communicator transmitter (DACT)
   (b) Digital alarm radio transmitter (DART)
   (c) McCulloh
   (d) Radio alarm transmitter (RAT)
   (e) All other types of communicators

2. **Supervising Station Fire Alarm Systems – Receivers – Inspections – Daily – {Reference C11E12} –** (a) Signal receipt – Verify receipt of signal.

3. **Supervising Station Fire Alarm Systems – Receivers – Testing – Annually – {Reference C11E12} –** (b) Receivers – Verify location and normal condition.

4. **Low-Power Radio – Wireless Systems – Receiving Equipment – Inspection – Monthly – {Reference C11E14} –** (3) Check batteries for all components in the system monthly unless the control unit checks all batteries and all components daily.

S = Satisfactory **U = Unsatisfactory**

System ID	Date	Inspector	Task/Result	Notes

CHAPTER 12 – EMERGENCY AND STANDBY POWER SYSTEMS

General Requirements for EPS and SEPS Systems (applicable at all facilities)

FCNYS 2020 1203.4	Maintenance. Emergency and standby power systems shall be maintained in accordance with NFPA 110 and NFPA 111 such that the system is capable of supplying service within the time specified for the type and duration required.
IFCNJ 2015 604.4.1	Schedule. Inspection, testing and maintenance of emergency and standby power systems shall be in accordance with an approved schedule established upon completion and approval of the system installation.
FCNYS 2020 1203.4.3	Records. Records of the inspection, testing and maintenance of emergency and standby power systems shall include the date of service, name of the servicing technician, a summary of conditions noted and a detailed description of any conditions requiring correction and what corrective action was taken. Such records shall be maintained.
IFCNJ 2015 604.5.	Operational Inspection and Testing. Emergency power systems, including all appurtenant components, shall be inspected and tested under load in accordance with NFPA 110 and NFPA 111. Exception: Where the emergency power system is used for standby power or peak load shaving, such use shall be recorded and shall be allowed to be substituted for scheduled testing of the generator set, provided that appropriate records are maintained.
FCNYS 2020 1203.6.	Supervision of Maintenance and Testing. Routine maintenance, inspection and operational testing shall be overseen by a properly instructed individual.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 604.3	Maintenance. Emergency power systems shall be maintained such that the system is capable of supplying service within the time specified for the type and duration of emergency power required by the Electrical Code and the construction codes, including the Building Code.
NYCFC 2014 604.3.2	Written record. Written records of the inspection, testing and other maintenance of emergency power systems shall include the date of service, name of the servicing technician, a summary of conditions noted and a detailed description of any conditions requiring correction and what corrective action was taken.
NYCFC 2014 604.5	Supervision. Inspection, testing and other maintenance shall be conducted under the personal supervision of a person who possesses the required knowledge and training to conduct such maintenance, and who has at least one of the following qualifications: 1. An electrician licensed by the Department of Buildings. 2. An electrician holding a special license issued by the Department of Buildings. 3. A person holding a stationary engineer license, or high-pressure boiler operating engineer's license, issued by the Department of Buildings. 4. A person holding a certificate of qualification. 5. A person holding a certificate of fitness as an FLS director. 6. A registered design professional.

A. Emergency And Standby Power Systems (EPSS)

A1. Existing Emergency Power Supply Systems – General Information — Update — Form PA 4107

Frequency – Annually

Review General Information Form for all Emergency Power Supply Systems, update as required.

Confirm that the instruction manuals, drawings, and documentation for routine maintenance and operational testing are provided as identified in Number 3 below

A2. New or Altered Emergency Power Supply Systems – General Information — Update — Form PA 4107

Frequency – As Required

Complete General Information Form for new Emergency Power Supply Systems or update General Information Form for Emergency Power Supply Systems that has been altered to include repairs and/or modifications to components.

Confirm that the instruction manuals, drawings, and documentation for routine maintenance and operational testing are provided as identified in Number 3 below

A3. Emergency Power Supply Systems — Manuals, Special Tools, and Spare Parts

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 A.8.2	NJ NYS	Where adequately secured from public access, it is desirable to locate an instruction manual, special tools and testing devices, and spare parts in the room in which the EPS is located. The articles should be mounted at a convenient location on a wall and should be enclosed in a metal or other suitable cabinet. The cabinet should accommodate the instruction manual on the inside of the door.	
NFPA 110 2016 8.2.1	NJ NYS	At least two sets of instruction manuals for all major components of the EPSS shall be supplied by the manufacturer(s) of the EPSS and shall contain the following: (1) A detailed explanation of the operation of the system (2) Instructions for routine maintenance (3) Detailed instructions for repair of the EPS and other major components of the EPSS (4) An illustrated parts list and part numbers (5) Illustrated and schematic drawings of electrical wiring systems, including operating and safety devices, control panels, instrumentation, and annunciators.	PA 4109
NFPA 110 2016 8.2.2	NJ NYS	For Level 1 systems, instruction manuals shall be kept in a secure, convenient location, one set near the equipment, and the other set in a separate location.	
NFPA 110 2016 8.2.3	NJ NYS	Special tools and testing devices necessary for routine maintenance shall be available for use when needed.	
NFPA 110 2016 8.2.4	NJ NYS	Replacement for parts identified by experience as high mortality items shall be maintained in a secure location(s) on the premises.	
NFPA 110 2016 8.2.4.1	NJ NYS	Consideration shall be given to stocking spare parts as recommended by the manufacturer.	

A4. Emergency Power Supply Systems — Maintenance and Operational Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.3.1*		The EPSS shall be maintained to ensure to a reasonable degree that the system is capable of supplying service within the time specified for the type and for the time duration specified for the class.	

NFPA 110 2016 A.8.3.1		The suggested maintenance procedure and frequency should follow those recommended by the manufacturer. In the absence of such recommendations, Figure A.8.3.1(a) and Figure A.8.3.1(b) indicate alternate suggested procedures.	
NFPA 110 2016 8.3.2		A routine maintenance and operational testing program shall be initiated immediately after the EPSS has passed acceptance tests or after completion of repairs that impact the operational reliability of the system.	PA 4108
NFPA 110 2016 8.3.2.1		The operational test shall be initiated at an ATS and shall include testing of each EPSS component on which maintenance or repair has been performed, including the transfer of each automatic and manual transfer switch to the alternate power source, for a period of not less than 30 minutes under operating temperature.	
NFPA 110 2016 8.3.3		A written schedule for routine maintenance and operational testing of the EPSS shall be established.	

EPSS Maintenance Schedule

Component (as applicable)	Procedure (X — Action, R — Replace, if needed)					Frequency (W — Weekly, M — Monthly, Q — Quarterly, S — Semiannually, A — Annually, Nos. indicate hours)	
	Visual Inspection	Check	Change	Clean	Test	Level 1	Level 2
1. Fuel							
(a) Main supply tank level		X				W	M
(b) Day tank level	X	X				W	M
(c) Day tank float switch	X				X	W	Q
(d) Supply or transfer pump operation	X				X	W	Q
(e) Solenoid valve operation	X				X	W	Q
(f) Strainer, filter, dirt leg, or combination				X		Q	Q
(g) Water in system		X		X		W	Q
(h) Flexible hose and connectors	X		R			W	M
(i) Tank vents and overflow piping unobstructed		X			X	A	A
(j) Piping	X					A	A
(k) Gasoline in main tank (when used)			R			A	A
2. Lubrication System							
(a) Oil level	X	X				W	M
(b) Oil change			R			50 or A	50 or A
(c) Oil filter(s)			R			50 or A	50 or A
(d) Lube oil heater		X				W	M
(e) Crankcase breather	X		R	X		Q	S
3. Cooling System							
(a) Level	X	X				W	M
(b) Antifreeze protection level					X	S	A
(c) Antifreeze			R			A	A
(d) Adequate cooling water to heat exchanger		X				W	M
(e) Rod out heat exchanger				X		A	A
(f) Adequate fresh air through radiator		X				W	M
(g) Clean exterior of radiator				X		A	A
(h) Fan and alternator belt	X	X				M	Q
(i) Water pump(s)	X					W	Q
(j) Condition of flexible hoses and connection	X	X				W	M
(k) Jacket water heater		X				W	M
(l) Inspect duct work, clean louvers	X	X		X		A	A
(m) Louver motors and controls	X			X	X	A	A
4. Exhaust System							
(a) Leakage	X	X				W	M
(b) Drain condensate trap		X				W	M

FIGURE A.8.3.1(a) Suggested Maintenance Schedule for Emergency Power Supply Systems (EPSSs).

EPSS Maintenance Schedule *(continued)*

Component (as applicable)	Procedure (X — Action, R — Replace, if needed)					Frequency (W — Weekly, M — Monthly, Q — Quarterly, S — Semiannually, A — Annually, Nos. indicate hours)	
	Visual Inspection	Check	Change	Clean	Test	Level 1	Level 2
(c) Insulation and fire hazards	X					Q	Q
(d) Excessive backpressure					X	A	A
(e) Exhaust system hangers and supports	X					A	A
(f) Flexible exhaust section	X					S	S
5. Battery System							
(a) Electrolyte level		X				W	M
(b) Terminals clean and tight	X	X				Q	Q
(c) Remove corrosion, case exterior clean and dry	X			X		M	M
(d) Specific gravity or state of charge					X	M	M
(e) Charger and charge rate	X					M	M
(f) Equalize charge		X				M	M
6. Electrical System							
(a) General inspection	X					W	M
(b) Tighten control and power wiring connections		X				A	A
(c) Wire chafing where subject to movement	X	X				Q	S
(d) Operation of safeties and alarms		X			X	S	S
(e) Boxes, panels, and cabinets				X		S	S
(f) Circuit breakers, fuses Note: Do not break manufacturer's seals or perform internal inspection on these devices.	X	X	R	X	X	M	A
(g) Transfer switch main contacts	X			X		A	A
(h) Calibration of voltage-sensing relays/devices		X			X	A	A
(i) Wire insulation breakdown					X	5/500[a]	3/500[b]
7. Prime Mover							
(a) General inspection	X					W	M
(b) Service air cleaner			R	X		S	S
(c) Governor oil level and linkage	X	X				M	M
(d) Governor oil			R			A	A
(e) Ignition system — plugs, points, coil, cap, rotor, secondary wire insulation	X	X	R	X	X	A	A
(f) Choke setting and carburetor adjustment		X				S	S
(g) Injector pump and injectors for flow rate pressure and/or spray pattern					X	A	A
(h) EPS at minimum of 30% nameplate rating					X	3/4[c]	3/4[c]

FIGURE A.8.3.1(a) *Continued*

EPSS Maintenance Schedule *(continued)*

Component (as applicable)	Procedure (X — Action, R — Replace, if needed)					Frequency (W — Weekly, M — Monthly, Q — Quarterly, S — Semiannually, A — Annually, Nos. indicate hours)	
	Visual Inspection	Check	Change	Clean	Test	Level 1	Level 2
(i) Valve clearance					X	3/500[b]	3/500[b]
(j) Torque bolts					X	3/500[b]	3/500[b]
8. Generator							
(a) Brush length, appearance, free to move in holder	X	X		X		S	S
(b) Commutator and slip rings	X			X		A	A
(c) Rotor and stator	X			X		A	A
(d) Bearing(s)	X		R			A	A
(e) Bearing grease		X	R			A	A
(f) Exciter	X	X		X		A	A
(g) Voltage regulator	X	X		X		A	A
(h) Measure and record resistance readings of windings with insulation tester (Megger)					X	A	A
9. (a) General condition of EPSS, any unusual condition of vibration, leakage, noise, temperature, or deterioration	X			X		W	M
(b) Service room or housing housekeeping	X			X		W	M
10. Restore system to automatic operation condition	X					W	M

[a] Every 5 years or 500 hours
[b] Every 3 years or 500 hours
[c] Every 3 years for 4 hours

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FIGURE A.8.3.1(a) *Continued*

A5. Emergency Power Supply Systems — Operational Inspection and Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.4.1*	Weekly / Monthly	EPSSs, including all appurtenant components, shall be inspected weekly and exercised under load at least monthly.	PA 4109
NFPA 110 2016 A.8.4.1		Weekly inspection does not require running of the EPS. Running unloaded generators as part of this weekly inspection can result in long-term problems such as wet stacking. See Figure A.8.4.1(a) and Figure A.8.4.1(b).	
NFPA 110 2016 8.4.1.1		If the generator set is used for standby power or for peak load shaving, such use shall be recorded and shall be permitted to be substituted for scheduled operations and testing of the generator set, providing the same record as required by 8.3.4.	
NFPA 110 2016 8.4.2*	Monthly	Diesel generator sets in service shall be exercised at least once monthly, for a minimum of 30 minutes, using one of the following methods: (1) Loading that maintains the minimum exhaust gas temperatures as recommended by the manufacturer (2) Under operating temperature conditions and at not less than 30 percent of the EPS standby nameplate kW rating	PA 4109

NFPA 110 2016 A.8.4.2		Light loading creates a condition termed wet stacking, indicating the presence of unburned fuel or carbon, or both, in the exhaust system. Its presence is readily indicated by the presence of continuous black smoke during engine-run operation. The testing requirements of 8.4.2 are intended to reduce the possibility of wet stacking. If equivalent loads are used for exercising, it is suggested that all essential loads be energized first, with the equivalent load used only to supplement the test. If the normal power were to fail during the exercise period, it would negate the urgency to automatically remove the equivalent load as described in 8.4.2.2. The generator set manufacturer should be consulted where the nameplate data do not indicate rating type. There is a difference between prime and standby ratings. For example, there are usually two kW nameplate ratings found on most engine-driven generators: “standby” and “prime.” There can be a significant difference between the resulting kW figures when calculating 30 percent of nameplate — for example, a 100 kW standby generator is normally considered an 80 kW set for prime power: 100 kW × 30% = 30 kW, but 80 kW × 30% = 24 kW. A permanent record of the rating should be maintained and readily available.	
NFPA 110 2016 8.4.2.1		The date and time of day for required testing shall be decided by the owner, based on facility operations.	
NFPA 110 2016 8.4.2.2		Equivalent loads used for testing shall be automatically replaced with the emergency loads in case of failure of the primary source.	
NFPA 110 2016 8.4.2.3*	NJ NYS Monthly / Annually	Diesel-powered EPS installations that do not meet the requirements of 8.4.2 shall be exercised monthly with the available EPSS load and shall be exercised annually with supplemental loads at not less than 50 percent of the EPS nameplate kW rating for 30 continuous minutes and at not less than 75 percent of the EPS nameplate kW rating for 1 continuous hour for a total test duration of not less than 1.5 continuous hours.	PA 4109
NFPA 110 2016 A.8.4.2.3	NJ NYS	The generator set manufacturer should be consulted where the nameplate data do not indicate rating type. There is a difference between prime and standby ratings. For example, there are usually two kW nameplate ratings found on most engine-driven generators: “standby” and “prime.” There can be a significant difference between the resulting kW figures when calculating 30 percent of nameplate — for example, a 100 kW standby generator is normally considered an 80 kW set for prime power: 100 kW × 30% = 30 kW, but 80 kW × 30% = 24 kW. A permanent record of the rating should be maintained and readily available.	
NFPA 110 2005 8.4.2.3*	NYC Monthly / Annually	Diesel-powered EPS installations that do not meet the requirements of 8.4.2 shall be exercised monthly with the available EPSS load and exercised annually with supplemental loads at 25 percent of nameplate rating for 30 minutes, followed by 50 percent of nameplate rating for 30 minutes, followed by 75 percent of nameplate rating for 60 minutes, for a total of 2 continuous hours.	PA 4109
NFPA 110 2005 A.8.4.2.3	NYC	The EPS should be exercised for the duration of its assigned class (see Section 4.2), or for a duration agreed to by the authority having jurisdiction not to exceed 6 hours, at least once annually under the conditions required by this section. The intent of this requirement is to provide reasonable assurance that the EPS with all of its auxiliary subsystems is capable of running for the duration of its assigned class.	
NFPA 110 2016 8.4.2.4	Monthly	Spark-ignited generator sets shall be exercised at least once a month with the available EPSS load for 30 minutes or until the water temperature and the oil pressure have stabilized.	PA 4109
NFPA 110 2016 8.4.2.4.1		The date and time of day for required testing shall be decided by the owner, based on facility operations.	
NFPA 110 2016 8.4.2.4.2		Equivalent loads used for testing shall be automatically replaced with the emergency loads in case of failure of the primary source.	
NFPA 110 2016 8.4.3		The EPS test shall be initiated by simulating a power outage using the test switch(es) on the ATSs or by opening a normal breaker. Opening a normal breaker shall not be required.	
NFPA 110 2016 8.4.3.1*		Where multiple ATSs are used as part of an EPSS, the monthly test initiating ATSs shall be rotated to verify the starting function on each ATS.	
NFPA 110 2016 A.8.4.3.1		The intent is to verify the starting function from each ATS to the EPS by rotating the ATS that initiates the cold engine start of the monthly test. For example, if the facility has 37 ATSs, it can take more than 3 years to verify the starting function of the ATSs. Consideration should be given to ATS criticality. Once the testing cycle is completed, in subsequent years the testing order can be modified to reflect changes to the EPSS.	
NFPA 110 2016 8.4.4		Load tests of generator sets shall include complete cold starts.	
NYCFC 2014 8.4.4.1	NYC	Inspection shall consist of observation of all EPSS components for leaks, abnormal device position and status of all alarm/trouble indicators.”	
NFPA 110 2005 8.4.9*	NYC 3 Years	Level 1 EPSS shall be tested for the duration of its assigned class (see Section 4.2), for at least 4 hours, at least once within every 36 months.	PA 4109
NFPA 110 2005 4.2*	NYC	Class. The class defines the minimum time, in hours, for which the EPSS is designed to operate at its rated load without being refueled or recharged. [see Table 4.1(a).]	

NFPA 110 2005 A.4.2	NYC	Selection of the class of the EPSS should take into account past outage records and fuel delivery problems due to weather, shortages, and other geographic and environmental conditions. Class "X" is a calculated value that usually represents between 48 and 96 hours of fuel for a Level 1 facility.	
NFPA 110 2005 8.4.9.1	NYC	The load shall be the EPSS system load running at the time of the test. The test shall be initiated by opening all switches or breakers supplying normal power to the EPSS.	
NFPA 110 2016 8.4.9*	NJ NYS 3 Years	Level 1 EPSS shall be tested at least once within every 36 months.	PA 4109
NFPA 110 2016 A.8.4.9	NJ NYS	The intent of this requirement is to provide reasonable assurance that the EPSS with all of its auxiliary subsystems is capable of running for the duration of its assigned class with its running load. A full facility power outage is not intended for this test but is recommended where a total facility power outage has not occurred within the last 36 months. Supplemental load banks are not required. After the test, the fuel supply should be replenished if necessary.	
NFPA 110 2016 8.4.9.1	NJ NYS	Level 1 EPSS shall be tested continuously for the duration of its assigned class (see Section 4.2).	PA 4109
NFPA 110 2016 4.2*	NJ NYS	Class. The class defines the minimum time, in hours, for which the EPSS is designed to operate at its rated load without being refueled or recharged. [See Table 4.1(a).]	
NFPA 110 2016 A.4.2	NJ NYS	Selection of the class of the EPSS should take into account past outage records and fuel delivery problems due to weather, shortages, and other geographic and environmental conditions. Class "X" is a calculated value that usually represents between 48 and 96 hours of fuel for a Level 1 facility. Where the seismic design category is C, D, E, or F, as determined in accordance with ASCE/SEI 7, Minimum Design Loads for Buildings and Other Structures, the EPS supplying a Level 1 EPSS should be capable of a minimum 96 hours of operation without refueling if it is determined that EPS operation is necessary for this period.	
NFPA 110 2016 Table 4.1(a)	NJ NYS	**Table 4.1(a) Classification of EPSSs** **Class** — **Minimum Time** Class 0.083 — 0.083 hr (5 min) Class 0.25 — 0.25 hr (15 min) Class 2 — 2 hr Class 6 — 6 hr Class 48 — 48 hr Class X — Other time, in hours, as required by the application, code, or user	
NFPA 110 2016 8.4.9.2	NJ NYS	Where the assigned class is greater than 4 hours, it shall be permitted to terminate the test after 4 continuous hours.	
NFPA 110 2016 8.4.9.3	NJ NYS	The test shall be initiated by operating at least one transfer switch test function and then by operating the test function of all remaining ATSs, or initiated by opening all switches or breakers supplying normal power to all ATSs that are part of the EPSS being tested.	
NFPA 110 2016 8.4.9.4		A power interruption to non-EPSS loads shall not be required.	
NFPA 110 2016 8.4.9.5	NJ NYS	The minimum load for this test shall be as specified in 8.4.9.5.1, 8.4.9.5.2, or 8.4.9.5.3.	
NFPA 110 2016 8.4.9.5.1*	NJ NYS	For a diesel-powered EPS, loading shall be not less than 30 percent of the nameplate kW rating of the EPS. A supplemental load bank shall be permitted to be used to meet or exceed the 30 percent requirement.	
NFPA 110 2016 A.8.4.9.5.1	NJ NYS	The generator set manufacturer should be consulted where the nameplate data do not indicate rating type. There is a difference between prime and standby ratings. For example, there are usually two kW nameplate ratings found on most engine-driven generators: "standby" and "prime." There can be a significant difference between the resulting kW figures when calculating 30 percent of nameplate — for example, a 100 kW standby generator is normally considered an 80 kW set for prime power: 100 kW × 30% = 30 kW, but 80 kW × 30% = 24 kW. A permanent record of the rating should be maintained and readily available.	
NFPA 110 2016 8.4.9.5.2	NJ NYS	For a diesel-powered EPS, loading shall be that which maintains the minimum exhaust gas temperatures as recommended by the manufacturer.	
NFPA 110 2016 8.4.9.5.3	NJ NYS	For spark-ignited EPSs, loading shall be the available EPSS load.	
NFPA 110 2016 8.4.9.6	NJ NYS	The test required in 8.4.9 shall be permitted to be combined with one of the monthly tests required by 8.4.2 and one of the annual tests required by 8.4.2.3 as a single test.	

NFPA 110 2016 8.4.9.7*	NJ NYS	Where the test required in 8.4.9 is combined with the annual load bank test, the first 3 hours shall be at not less than the minimum loading required by 8.4.9.5 and the remaining hour shall be at not less than 75 percent of the nameplate kW rating of the EPS.	
NFPA 110 2016 A.8.4.9.7	NJ NYS	The generator set manufacturer should be consulted where the nameplate data do not indicate rating type. There is a difference between prime and standby ratings. For example, there are usually two kW nameplate ratings found on most engine-driven generators: “standby” and “prime.” There can be a significant difference between the resulting kW figures when calculating 30 percent of nameplate — for example, a 100 kW standby generator is normally considered an 80 kW set for prime power: 100 kW × 30% = 30 kW, but 80 kW × 30% = 24 kW. A permanent record of the rating should be maintained and readily available.	
IFCNJ 2015 604.4.1.3	NJ Annually	Emergency Generators Required emergency generators shall be tested at least annually in accordance with the manufacturer's specifications under anticipated load conditions. (1) Transition test. A transition test shall be conducted annually to ensure that the transfer time from normal power to emergency power is 10 seconds or less. (2) Fuel supply. Where internal combustion engines are utilized as the prime mover for an emergency generator, an on-site fuel supply shall be provided sufficient for not less than 2 hours full-demand operation of the system.	PA 4109

A6. Emergency Power Supply Systems — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.3.1*		The EPSS shall be maintained to ensure to a reasonable degree that the system is capable of supplying service within the time specified for the type and for the time duration specified for the class.	
NFPA 110 2016 A.8.3.1		The suggested maintenance procedure and frequency should follow those recommended by the manufacturer. In the absence of such recommendations, Figure A.8.3.1(a) and Figure A.8.3.1(b) indicate alternate suggested procedures.	
NFPA 110 2016 8.3.2		A routine maintenance and operational testing program shall be initiated immediately after the EPSS has passed acceptance tests or after completion of repairs that impact the operational reliability of the system.	
NFPA 110 2016 8.3.2.1		The operational test shall be initiated at an ATS and shall include testing of each EPSS component on which maintenance or repair has been performed, including the transfer of each automatic and manual transfer switch to the alternate power source, for a period of not less than 30 minutes under operating temperature.	
NFPA 110 2016 8.3.3		A written schedule for routine maintenance and operational testing of the EPSS shall be established.	

A7. Transfer Switch — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 604.4.3		Switch Maintenance Emergency and standby power system transfer switches shall be included in the inspection, testing and maintenance schedule required by Section 604.4.1. Transfer switches shall be maintained free from accumulated dust and dirt. Inspection shall include examination of the transfer switch contacts for evidence of deterioration. When evidence of contact deterioration is detected, the contacts shall be replaced in accordance with the transfer switch manufacturer's instructions.	
NFPA 110 2016 8.3.4*		Transfer switches shall be subjected to a maintenance and testing program that includes all of the following operations: (1) Checking of connections (2) Inspection or testing for evidence of overheating and excessive contact erosion (3) Removal of dust and dirt (4) Replacement of contacts when required	

NFPA 110 2016 A.8.3.4	Quarterly / Annually	Where sealed devices are used, replacement of the complete device might be necessary. Maintenance should be performed according to manufacturer's recommendations. In the absence of such recommendations, the list given in 8.3.4 suggests minimal procedures. Transfer switches should be subjected to an annual maintenance program including (one) major maintenance and (three) quarterly inspections. Programs should include all of the following operations. Note: Due to the critical nature of these devices, permission should be gained to perform these tasks since some of the following recommendations could cause disruption of power to the load. The following tasks should be carefully reviewed with facility management personnel to ensure agreement and plan for contingencies.	PA 4110

A8. Transfer Switch Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 604.5.1		Transfer Switch Test The test of the transfer switch shall consist of electrically operating the transfer switch from the normal position to the alternate position and then return to the normal position.	
NFPA 110 2005 8.4.6	NYC SemiAnnually	Transfer switches shall be operated semi-annually.	PA 4110
NFPA 110 2005 8.4.6.1	NYC SemiAnnually	The semi-annual test of a transfer switch shall consist of electrically operating the transfer switch from the standard position to the alternate position and then a return to the standard position.	PA 4110
NFPA 110 2016 8.4.6	NJ NYS Monthly	Transfer switches shall be operated monthly.	PA 4110
NFPA 110 2016 8.4.6.1*	NJ NYS Monthly	The monthly test of a transfer switch shall consist of electrically operating the transfer switch from the primary position to the alternate position and then a return to the primary position.	PA 4110
NFPA 110 2016 A.8.4.6.1	NJ NYS	This requirement is to simulate a power outage without turning off normal power. This requirement allows selected ATSs to be transferred back to normal before the entire 30-minute test is complete when required for operational or safety considerations. Selected ATSs can be electrically operated at a different time than the monthly operational test when required for operational or safety considerations, provided the monthly requirement of 8.4.6 is met.	
NFPA 110 2016 8.4.6.2		The criteria set forth in Section 4.3 and in Table 4.1(b) shall not be required during the monthly testing of the EPSS. If the criteria are not met during the monthly test, a process shall be provided to annually confirm the capability of the system to comply with Section 4.3.	
NFPA 110 2016 4.3.		Type. The type defines the maximum time, in seconds, that the EPSS will permit the load terminals of the transfer switch to be without acceptable electrical power. Table 4.1(b) provides the types defined by this standard.	
NFPA 110 2016 Table 4.1(b)		**Table 4.1(b) Types of EPSSs** **Designation** — **Power Restoration** Type U — Basically uninterruptible (UPS systems) Type 10 — 10 sec Type 60 — 60 sec Type 120 — 120 sec Type M — Manual stationary or nonautomatic — no time limit	

A9. Circuit Breakers — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.4.7*	Annually	EPSS circuit breakers for Level 1 system usage, including main and feed breakers between the EPS and the transfer switch load terminals, shall be exercised annually with the EPS in the "off" position.	PA 4110
NFPA 110 2016 A.8.4.7	2 Years	Circuit breakers should be tested under simulated overload conditions every 2 years.	PA 4110
NFPA 110 2016 8.4.7.1	SemiAnnually	Circuit breakers rated in excess of 600 volts for Level 1 system usage **shall be exercised every 6 months** and shall be tested under simulated overload conditions every 2 years.	PA 4110
NFPA 110 2016 8.4.7.1	2 Years	Circuit breakers rated in excess of 600 volts for Level 1 system usage shall be exercised every 6 months and **shall be tested under simulated overload conditions every 2 years**.	PA 4110

A10. Paralleling Gear — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.3.5*	As per Approved Program	Paralleling gear shall be subject to an inspection, testing, and maintenance program that includes all of the following operations: (1) Checking connections (2) Inspecting or testing for evidence of overheating and excessive contact erosion (3) Removing dust and dirt (4) Replacing contacts when required (5) Verifying that the system controls will operate as intended	PA 4111
NFPA 110 2016 A.8.3.5		Paralleling switchgear offers many advantages when testing and exercising. The system exercise period would be initiated by the automatic transfer switch (ATS) controls, and once operating, the system could be staged to establish appropriate loading of each EPS. In addition, load-add, load-shed, load demand control, load optimization, and other operating and control features should be tested at appropriate intervals. Logic controls that contain load block information should be adjusted as necessary, and load priorities should be reviewed as ATS loads change.	

A11. Storage Batteries — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.3.6*	Weekly	Storage batteries, including electrolyte levels or battery voltage, used in connection with systems shall be inspected weekly and maintained in full compliance with manufacturer's specifications.	PA 4111
NFPA 110 2016 A.8.3.6	Quarterly	A battery load test should be performed quarterly.	PA 4111
NFPA 110 2016 8.3.6.1	Monthly	Maintenance of lead-acid batteries shall include the monthly testing and recording of electrolyte specific gravity. Battery conductance testing shall be permitted in lieu of the testing of specific gravity when applicable or warranted.	PA 4111
NFPA 110 2016 8.3.6.2		Defective batteries shall be replaced immediately upon discovery of defects.	

A12. Fuel — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.3.7*	Annually	A fuel quality test shall be performed at least annually using appropriate ASTM standards.	PA 4111
NFPA 110 2016 A.8.3.7		Limited fuel quality testing performed annually using appropriate ASTM standard test methods is recommended as a means to determine that existing fuel inventories are suitable for continued long-term storage. Special attention should be paid to sampling the bottom of the storage tank to verify that the stored fuel is as clean and dry as practicable and that water, sediment, or microbial growth on the tank bottom is minimized. ASTM D 975, Standard Specification for Diesel Fuel Oils, contains test methods for existing diesel fuel.	

A13. Records — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 110 2016 8.5.1		Records shall be created and maintained for all EPSS inspections, operational tests, exercising, repairs, and modifications.	
NFPA 110 2016 8.5.2		Records required in 8.5.1 shall be made available to the authority having jurisdiction on request.	
NFPA 110 2016 8.5.3		The record shall include the following: (1) The date of the maintenance report (2) Identification of the servicing personnel (3) Notation of any unsatisfactory condition and the corrective action taken, including parts replaced (4) Testing of any repair in the time recommended by the manufacturer	
NFPA 110 2016 8.5.4		Records shall be retained for a period of time defined by the facility management or by the authority having jurisdiction.	

B. Stored Electrical Energy Emergency and Standby Power Systems (SEPSS)

B1. Existing SEPSS General Information — Update — Form PA 4107

Frequency – Annually

Review general Information Form for all Stored Electrical Energy Emergency and Standby Power Systems, update as required.

Confirm that the instruction manuals, drawings, and documentation for routine maintenance and operational testing are provided as identified in Number 3 below

B2. New or Altered SEPSS General Information — Update — Form PA 4107

Frequency – As Required

Complete General Information Form for new Stored Electrical Energy Emergency and Standby Power Systems or update General Information Form for Stored Electrical Energy Emergency and Standby Power Systems that has been altered to include repairs and/or modifications to components.

Confirm that the instruction manuals, drawings, and documentation for routine maintenance and operational testing are provided as identified in Number 3 below

B3. SEPSS — Manuals, Special Tools, and Spare Parts

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 111 2013 8.2.1		At least two sets of instruction manuals for the SEPSS shall be supplied by the manufacturer of the SEPSS and shall contain the following: (1) A detailed explanation of the operation of the system (2) A schematic wiring diagram (3) A function block diagram (4) The energy storage device's specification, installation instructions, maintenance information, and wiring diagrams (5) Instructions for routine maintenance (6) Recommended spare parts list with part numbers and part sources (7) Routine troubleshooting procedures	PA 4112
NFPA 111 2013 8.2.2		For Level 1, one set of the instructions shall be kept with the equipment, and the other set shall be kept in another secure location.	
NFPA 111 2013 8.2.3		Special tools and testing devices required for routine maintenance shall be available for use when needed.	

B4. SEPSS — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 111 2013 8.4.1*	Monthly	Level 1 equipment shall be inspected monthly and tested in accordance with the manufacturer's recommendations. (See Figure A.8.4.2.)	PA 4112

NFPA 111 2013 A.8.4.1		In addition to the manufacturer's recommendations, the following standards provide information on battery inspection, testing, and maintenance: (1) IEEE 450, Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications (2) IEEE 1106, Recommended Practice for Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications (3) IEEE 1188, Recommended Practice for Maintenance, Testing and Replacement of Valve-Regulated Lead-Acid Batteries for Stationary Applications Depending on the type of batteries and the manufacturer's recommendations, the following should be included: (1) Monthly: (a) Battery float voltage (b) Pilot-cell float voltage and temperature (2) Quarterly: Float voltage readings on all cells or multicell units, augmented in VRLA batteries by internal ohmic measurements on all cells or multicell units (3) Annually: Discharge test under connected load for at least 5 minutes.	
NFPA 111 2013 8.4.2*		Inspection of the equipment shall include the following: (1) The battery and associated charger/control equipment shall be checked to verify that they are in a clean and satisfactory condition and that no exceptional environmental or other conditions exist that could damage or affect performance. (2) Battery electrolyte levels shall be checked, where applicable, and refilled as necessary. (3) Terminals and intercell connectors shall be cleaned and regreased, if necessary, and cell tops shall be cleaned. (4) Individual cell voltages shall be checked and recorded where practical. (5) The specific gravity of pilot cells shall be checked and recorded, where applicable. (6) The conditions of the plates and sediment of freeelectrolyte, LAbatteries in transparent containers shall be noted. (7) All indicator lamps, meters, and controls shall be checked to verify that they are operating correctly. (8) The load value shall be checked to ensure that it is within the equipment rating.	
NFPA 111 2013 A.8.4.2		Figure A.8.4.2 provides guidance for operation and testing.	

SEPSS MAINTENANCE SCHEDULE CHECKLIST

Component Description	Frequency	Action Performed: Yes	No	N/A	Date Completed
Battery					
Check float voltage	M	❑	❑	❑	_____
Check cable connections	S	❑	❑	❑	_____
Clean terminals	Q	❑	❑	❑	_____
Test electrolyte gravity	Q	❑	❑	❑	_____
Visually inspect electrolyte level	M	❑	❑	❑	_____
Visually inspect and replace cell or battery	Manufacturer's instructions	❑	❑	❑	_____
ECE					
Check power supply voltage	M	❑	❑	❑	_____
Check terminals	S	❑	❑	❑	_____
Visually inspect panel meters	M	❑	❑	❑	_____
Visually inspect panel lamps	M	❑	❑	❑	_____
Visually inspect circuit breakers/ fuses, check, replace, or clean	Every 2 years	❑	❑	❑	_____
Battery Charger					
Check output terminal voltage	M	❑	❑	❑	_____
Visually inspect, check, replace, and clean fuses	Every 2 years	❑	❑	❑	_____
Test charge current	Q	❑	❑	❑	_____
Check/equalize voltage	Q	❑	❑	❑	_____
Visually inspect panel meters	M	❑	❑	❑	_____
Check panel lamps	M	❑	❑	❑	_____
Load					
Check load current	Q	❑	❑	❑	_____
Check panel meters	M	❑	❑	❑	_____
Transfer Switch					
Visually inspect contacts	A	❑	❑	❑	_____
Verify test switch	S	❑	❑	❑	_____

Measure and Record Values:

	Date		Date
Output AC Volts		**Charge Current**	
Frequency in Hz	_____	Prior to ac failure	_____
Load in amperes	_____	5 minutes after failure	_____
DC Voltage		**Meters**	_____
Prior to ac failure	_____	**Panel lamps**	_____
1 minute after ac failure	_____	**Load circuit breakers**	_____
5 minutes after restoring ac input	_____	**Bus bars/cables of battery systems**	_____
Battery Wet Lead-Acid			
For each battery	_____		
Measure gravity	_____		
Check electrolyte level	_____		

M: Monthly. Q: Quarterly. S: Semiannually. A: Annually.

Test performed by: _____ Date: _____ /_____ /_____

 NFPA 111

FIGURE A.8.4.2 Stored-Energy Emergency Power Supply System Operation and Suggested Testing Log.

B5. SEPSS Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 111 2013 8.4.1*	NJ NYS As per Manuafacturer's Recommendations	Level 1 equipment shall be inspected monthly and tested in accordance with the manufacturer's recommendations. (See Figure A.8.4.2.)	PA 4112
NFPA 111 2013 A.8.4.1		In addition to the manufacturer's recommendations, the following standards provide information on battery inspection, testing, and maintenance: (1) IEEE 450, Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications (2) IEEE 1106, Recommended Practice for Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications (3) IEEE 1188, Recommended Practice for Maintenance, Testing and Replacement of Valve-Regulated Lead-Acid Batteries for Stationary Applications Depending on the type of batteries and the manufacturer's recommendations, the following should be included: (1) Monthly: (a) Battery float voltage (b) Pilot-cell float voltage and temperature (2) Quarterly: Float voltage readings on all cells or multicell units, augmented in VRLA batteries by internal ohmic measurements on all cells or multicell units (3) Annually: Discharge test under connected load for at least 5 minutes.	
NFPA 111 2013 8.4.1	NYC Quarterly	Level 1 equipment shall be inspected monthly and shall be exercised at least quarterly under connected load for a minimum of 5 minutes or as specified for the class, whichever is less. (See Figure A.8.4.2 for guidance.)	PA 4112
NFPA 111 2013 8.4.3.1		A load test shall be performed as required by 8.4.1. The output voltage, battery voltage, and duration of the test shall be recorded at the beginning and at the end of the test for each battery set.	
NFPA 111 2013 8.4.3.2		When a method of ohmic measurements is used to monitor LA batteries, the results shall be maintained and checked for deviance from the baseline established at the time of the battery system installation acceptance in 7.6.5. If data are within the acceptable range as determined by the battery manufacturer, annual load testing shall not be required. If data indicate deviation outside an acceptable range determined by the battery manufacturer, the SEPSS shall be checked at full load for the full duration for its class. A fully rated load bank shall be used in lieu of an actual load provided it is sized to be equal to the ECE rating.	
NFPA 111 2013 8.4.3.3	Annually	When a history of ohmic measurements is not used or maintained, the SEPSS shall be checked annually at full load for 60 percent of its class. A fully rated load bank shall be permitted in lieu of an actual load provided it is sized to be equal to the ECE rating.	PA 4112
NFPA 111 2013 8.4.4	Annually	The SEPSS shall be checked annually at full load for 60 percent of its class.	PA 4112

B6. SEPSS Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 111 2013 8.1.	As per Manufacturer's Recommendations	General. The SEPSS shall have routine maintenance and operational testing based on the manufacturer's recommendations, instruction manuals, and the minimum requirements of this chapter and subject to the approval of the authority having jurisdiction.	PA 4113
NFPA 111 2013 8.3.1		The SEPSS shall be maintained so that the system is capable of supplying the service quality within the time specified for the type and for the time duration specified for the class.	
NFPA 111 2013 8.3.2*		A routine maintenance and operational testing program shall be initiated immediately following the acceptance test or any repair or component replacement, including battery replacement. (See Table A.8.3.2 and Figure A.8.4.2 for guidance.)	
NFPA 111 2013 A.8.3.2		Maintenance procedures and frequency should follow those recommended by the manufacturer. In the absence of such recommendations, Table A.8.3.2 indicates suggested procedures.	

Table A.8.3.2 Suggested Maintenance Schedule for Solid-State Emergency Power Supply Systems

	Procedure					
Item Component (as Applicable)	Visual Inspection	Check	Change	Clean	Test	Frequency
Battery						
Float voltage		X				M
Cable connections		X				S
Terminals				X		Q
Electrolyte gravity					X	Q
Electrolyte level	X					M
Replace cell or battery			X			See manufacturer's instructions
ECE						
Power supply voltage		X				M
Terminals		X				S
Panel meters	X					M
Panel lamps	X					M
Circuit breakers, fuses	X	X	X	X		Every 2 years
Battery charger						
Output terminal volts		X				M
Fuses	X	X	X	X		Every 2 years
Charge current		X			X	Q
Equalize voltage		X				Q
Panel meters	X					M
Panel lamps	X					M
Load						
Load current		X				Q
Panel meters	X					M
Transfer switch						
Contacts	X					A
Test switch					X	S
Fuel cell						
Check fuel supply (pressure/ quantity)	X					Q
Start up system	X					Q
Exercise load until system heats up					X	Q
Fuel supply piping	X					A
Exhaust piping	X					A
Air supply piping	X					A
Cooling system	X					A
Connectors				X		A
Fuel system pressure/leakage					X	A
Full load test					X	A
Calibrate H_2 detector		X				A

A: Annually. M: Monthly. Q: Quarterly. S: Semiannually. X: Actions.

B7. Records Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 111 2013 8.3.3.1		A reproducible record of inspection, tests, and repairs shall be maintained on the premises.	
NFPA 111 2013 8.3.3.2		The record shall include the following: (1) Completion of a log (2) Notification of any unsatisfactory condition and the corrective actions taken, including parts replaced (3) Identification of the servicing personnel (4) Documentation of a completed test of the SEPSS, according to 8.4.1, immediately following any repair or battery replacement	

EMERGENCY AND STANDBY POWER SYSTEMS
GENERAL INFORMATION

PA 4107 / 12-20

Building ID: **System ID:**

Original Installation Date:

Date: **Inspector:**

Fully describe the Emergency Power Supply System (EPSS): (include a description on what the EPSS provides power for, as applicable)

Type of Emergency Power Supply: (Storage Battery, Generator Set, UPS, Separate Service, Unit Equipment, etc.)	
Emergency Power Supply Driver: (Manufacturer, Make, Model)	
Emergency Power Supply Location:	
Fuel Storage Location(s):	
Transfer Switches: (number and location)	
Storage Batteries:	

Notes:

EMERGENCY AND STANDBY POWER SYSTEMS
EMERGENCY POWER SUPPLY SYSTEMS
MAINTENANCE AND OPERATIONAL TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of emergency power supply systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Fuel – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 1 of Figure A.8.3.1(a).

(a) Main supply tank level	(b) Day tank level	(c) Day tank float switch
(d) Supply or transfer pump operation	(e) Solenoid valve operation	(f) Strainer, filter, dirt leg, or combination
(g) Water in system	(h) Flexible hose and connectors	(i) Tank vents and overflow piping unobstructed
(j) Piping	(k) Gasoline in main tank (when used)	

2. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Lubrication System– Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 2 of Figure A.8.3.1(a).

(a) Oil level	(b) Oil change	(c) Oil filter(s)
(d) Lube oil heater	(e) Crankcase breather	

3. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Cooling System – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 3 of Figure A.8.3.1(a).

(a) Level	(b) Antifreeze protection level	(c) Antifreeze
(d) Adequate cooling water to heat exchanger	(e) Rod out heat exchanger	(f) Adequate fresh air through radiator
(g) Clean exterior of radiator	(h) Fan and alternator belt	(i) Water pump(s)
(j) Condition of flexible hoses and connection	(k) Jacket water heater	(l) Inspect duct work, clean louvers
(m) Louver motors and controls		

4. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Exhaust System – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 4 of Figure A.8.3.1(a).

(a) Leakage	(b) Drain condensate trap	(c) Insulation and fire hazards
(d) Excessive backpressure	(e) Exhaust system hangers and supports	(f) Flexible exhaust section

5. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Battery System – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 5 of Figure A.8.3.1(a).

(a) Electrolyte level	(b) Terminals clean and tight	(c) Remove corrosion, case exterior clean and dry
(d) Specific gravity or state of charge	(e) Charger and charge rate	(f) Equalize charge

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

EMERGENCY AND STANDBY POWER SYSTEMS
EMERGENCY POWER SUPPLY SYSTEMS
MAINTENANCE AND OPERATIONAL TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of emergency power supply systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

6. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Electrical System – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 6 of Figure A.8.3.1(a).

(a) General inspection	(b) Tighten control and power wiring connections	(c) Wire chafing where subject to movement
(d) Operation of safeties and alarms	(e) Boxes, panels, and cabinets	(f) Circuit breakers, fuses Note: Do not break manufacturer's seals or perform internal inspection on these devices.
(g) Transfer switch main contacts	(h) Calibration of voltage-sensing relays/devices	(i) Wire insulation breakdown

7. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Prime Mover – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 7 of Figure A.8.3.1(a).

(a) General inspection	(b) Service air cleaner	(c) Governor oil level and linkage
(d) Governor oil	(e) Ignition system — plugs, points, coil, cap, rotor, secondary wire insulation	(f) Choke setting and carburetor adjustment
(g) Injector pump and injectors for flow rate pressure and/or spray pattern	(h) EPS at minimum of 30% nameplate rating	(i) Valve clearance
(j) Torque bolts		

8. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Generator – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 8 of Figure A.8.3.1(a).

(a) Brush length, appearance, free to move in holder	(b) Commutator and slip rings	(c) Rotor and stator
(d) Bearing(s)	(e) Bearing grease	(f) Exciter
(g) Voltage regulator	(h) Measure and record resistance readings of windings with insulation tester (Megger)	

9. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – General Condition – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 9 of Figure A.8.3.1(a).

(a) General condition of EPSS, any unusual condition of vibration, leakage, noise, temperature, or deterioration
(b) Service room or housing housekeeping

10. Emergency Power Supply Systems – Maintenance and Operational Testing – {Reference C12A4} – Restoration – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Component 10 of Figure A.8.3.1(a).

- Restore system to automatic operation condition

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

EMERGENCY AND STANDBY POWER SYSTEMS — PA 4109 / 12-20

EMERGENCY POWER SUPPLY SYSTEMS – MANUALS, SPECIAL TOOLS, AND SPARE PARTS MAINTENANCE, OPERATIONAL INSPECTION / TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of emergency power supply systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Emergency Power Supply Systems – Manuals, Special Tools, and Spare Parts – {Reference C12A3} –** At least two sets of instruction manuals for all major components of the EPSS shall be supplied by the manufacturer(s) of the EPSS and shall contain the following:
   (1) A detailed explanation of the operation of the system
   (2) Instructions for routine maintenance
   (3) Detailed instructions for repair of the EPS and other major components of the EPSS
   (4) An illustrated parts list and part numbers
   (5) Illustrated and schematic drawings of electrical wiring systems, including operating and safety devices, control panels, instrumentation, and annunciators.

2. **Emergency Power Supply Systems – Operational Inspection and Testing – Inspection – Weekly – {Reference C12A5} –** EPSSs, including all appurtenant components, shall be inspected weekly.

3. **Emergency Power Supply Systems – Operational Inspection and Testing – Testing – Monthly – {Reference C12A5} –** EPSSs, including all appurtenant components, shall be exercised under load at least monthly. Diesel generator sets in service shall be exercised at least once monthly, for a minimum of 30 minutes, using one of the following methods:
   (1) Loading that maintains the minimum exhaust gas temperatures as recommended by the manufacturer
   (2) Under operating temperature conditions and at not less than 30 percent of the EPS standby nameplate kW rating

4. **Emergency Power Supply Systems – Operational Inspection and Testing – Testing – Monthly/Annually – {Reference C12A5} –** Diesel-powered EPS installations that do not meet the requirements of 8.4.2 shall be exercised monthly with the available EPSS load and shall be exercised annually with supplemental loads as per jurisdictional requirements.

5. **Emergency Power Supply Systems – Operational Inspection and Testing – Testing – Monthly – {Reference C12A5} –** Spark-ignited generator sets shall be exercised at least once a month with the available EPSS load for 30 minutes or until the water temperature and the oil pressure have stabilized.

6. **Emergency Power Supply Systems – Operational Inspection and Testing – Testing – Monthly – {Reference C12A5} –** Level 1 EPSS shall be tested at least once within every 36 months as per jurisdictional requirements.

7. **Emergency Power Supply Systems – Operational Inspection and Testing – Testing – Annually – {Reference C12A5} –** Required emergency generators shall be tested at least annually in accordance with the manufacturer's specifications under anticipated load conditions.
   (1) Transition test. A transition test shall be conducted annually to ensure that the transfer time from normal power to emergency power is 10 seconds or less.
   (2) Fuel supply. Where internal combustion engines are utilized as the prime mover for an emergency generator, an on-site fuel supply shall be provided sufficient for not less than 2 hours full-demand operation of the system.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

EMERGENCY AND STANDBY POWER SYSTEMS

PA 4110 / 12-20

EMERGENCY POWER SUPPLY SYSTEMS – TRANSFER SWITCH, CIRCUIT BREAKERS INSPECTIONS / TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of emergency power supply systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Emergency Power Supply Systems – Transfer Switch – Inspection/Maintenance – Quarterly – {Reference C12A7} –** Transfer switches should be subjected to an annual maintenance program including (one) major maintenance and (three) quarterly inspections. Transfer switches shall be subjected to a maintenance and testing program that includes all of the following operations:
   (1) Checking of connections
   (2) Inspection or testing for evidence of overheating and excessive contact erosion
   (3) Removal of dust and dirt
   (4) Replacement of contacts when required

2. **Emergency Power Supply Systems – Transfer Switch – Testing – Monthly – {Reference C12A8} –** The monthly test of a transfer switch shall consist of electrically operating the transfer switch from the primary position to the alternate position and then a return to the primary position. This requirement is to simulate a power outage without turning off normal power. This requirement allows selected ATSs to be transferred back to normal before the entire 30-minute test is complete when required for operational or safety considerations.

3. **Emergency Power Supply Systems – Transfer Switch – Testing – SemiAnnually – {Reference C12A8} –** The semi-annual test of a transfer switch shall consist of electrically operating the transfer switch from the standard position to the alternate position and then a return to the standard position.

4. **Emergency Power Supply Systems – Circuit Breakers – Testing – Annually – {Reference C12A9} –** EPSS circuit breakers for Level 1 system usage, including main and feed breakers between the EPS and the transfer switch load terminals, shall be exercised annually with the EPS in the "off" position.

5. **Emergency Power Supply Systems – Circuit Breakers – Testing – 2 Years – {Reference C12A9} –** Circuit breakers should be tested under simulated overload conditions every 2 years.

6. **Emergency Power Supply Systems – Circuit Breakers – Testing – SemiAnnually – {Reference C12A9} –** Circuit breakers rated in excess of 600 volts for Level 1 system usage **shall be exercised every 6 months** and shall be tested under simulated overload conditions every 2 years.

7. **Emergency Power Supply Systems – Circuit Breakers – Testing – 2 Years – {Reference C12A9} –** Circuit breakers rated in excess of 600 volts for Level 1 system usage shall be exercised every 6 months and **shall be tested under simulated overload conditions every 2 years**.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

EMERGENCY AND STANDBY POWER SYSTEMS

PA 4111 / 12-20

EMERGENCY POWER SUPPLY SYSTEMS – PARALLELING GEAR, STORAGE BATT., FUEL INSPECTIONS / TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of emergency power supply systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Emergency Power Supply Systems – Paralleling Gear – Inspection/Testing/Maintenance – As Per Approved Program - {Reference C12A10} –** Paralleling gear shall be subject to an inspection, testing, and maintenance program that includes all of the following operations:
   (1) Checking connections
   (2) Inspecting or testing for evidence of overheating and excessive contact erosion
   (3) Removing dust and dirt
   (4) Replacing contacts when required
   (5) Verifying that the system controls will operate as intended

2. **Emergency Power Supply Systems – Storage Batteries – Inspection/Maintenance – Weekly – {Reference C12A11} –** Storage batteries, including electrolyte levels or battery voltage, used in connection with systems shall be inspected weekly and maintained in full compliance with manufacturer's specifications.

3. **Emergency Power Supply Systems – Storage Batteries – Testing – Quarterly – {Reference C12A11} –** A battery load test should be performed quarterly.

4. **Emergency Power Supply Systems – Storage Batteries – Testing – Monthly – {Reference C12A11} –** Maintenance of lead-acid batteries shall include the monthly testing and recording of electrolyte specific gravity. Battery conductance testing shall be permitted in lieu of the testing of specific gravity when applicable or warranted.

5. **Emergency Power Supply Systems – Fuel – Testing – Annually – {Reference C12A12} –** A fuel quality test shall be performed at least annually using appropriate ASTM standards.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

EMERGENCY AND STANDBY POWER SYSTEMS

PA 4112 / 12-20

STORED ELECTRICAL ENERGY EMERGENCY AND STANDBY POWER SYSTEMS INSPECTIONS / TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of stored electrical energy emergency and standby power systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Stored Electrical Energy Emergency and Standby Power Systems – Manuals, Special Tools, and Spare Parts – {Reference C12B3} –** At least two sets of instruction manuals for the SEPSS shall be supplied by the manufacturer of the SEPSS and shall contain the following:

(1) A detailed explanation of the operation of the system	(2) A schematic wiring diagram	(3) A function block diagram
(4) The energy storage device's specification, installation instructions, maintenance information, and wiring diagrams	(5) Instructions for routine maintenance	(6) Recommended spare parts list with part numbers and part sources
(7) Routine troubleshooting procedures		

2. **Stored Electrical Energy Emergency and Standby Power Systems – Inspection – Monthly – {Reference C12B4} –** Level 1 equipment shall be inspected monthly and tested in accordance with the manufacturer's recommendations. (See Figure A.8.4.2.) Inspection of the equipment shall include the following:

(1) The battery and associated charger/control equipment shall be checked to verify that they are in a clean and satisfactory condition and that no exceptional environmental or other conditions exist that could damage or affect performance.	(2) Battery electrolyte levels shall be checked, where applicable, and refilled as necessary.	(3) Terminals and intercell connectors shall be cleaned and regreased, if necessary, and cell tops shall be cleaned.
(4) Individual cell voltages shall be checked and recorded where practical.	(5) The specific gravity of pilot cells shall be checked and recorded, where applicable.	(6) The conditions of the plates and sediment of freeelectrolyte, LAbatteries in transparent containers shall be noted.
(7) All indicator lamps, meters, and controls shall be checked to verify that they are operating correctly.	(8) The load value shall be checked to ensure that it is within the equipment rating.	

3. **Stored Electrical Energy Emergency and Standby Power Systems – Testing – As Per Manuafacturer's Recommendations – {Reference C12B5} –** Level 1 equipment shall be inspected monthly and tested in accordance with the manufacturer's recommendations. (See Figure A.8.4.2.)

4. **Stored Electrical Energy Emergency and Standby Power Systems – Testing – Quarterly – {Reference C12B5} –** Level 1 equipment shall be inspected monthly and shall be exercised at least quarterly under connected load for a minimum of 5 minutes or as specified for the class, whichever is less. (See Figure A.8.4.2 for guidance.)

5. **Stored Electrical Energy Emergency and Standby Power Systems – Testing – Annually – {Reference C12B5} –** When a history of ohmic measurements is not used or maintained, the SEPSS shall be checked annually at full load for 60 percent of its class. A fully rated load bank shall be permitted in lieu of an actual load provided it is sized to be equal to the ECE rating.

6. **Stored Electrical Energy Emergency and Standby Power Systems – Testing – Annually – {Reference C12B5} –** The SEPSS shall be checked annually at full load for 60 percent of its class.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

EMERGENCY AND STANDBY POWER SYSTEMS

PA 4113 / 12-20

STORED ELECTRICAL ENERGY EMERGENCY AND STANDBY POWER SYSTEMS MAINTENANCE AND OPERATIONAL TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of stored electrical energy emergency and standby power systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Stored Electrical Energy Emergency and Standby Power Systems – Maintenance – As Per Manufacturer's Recommendations - {Reference C12B6} –** Battery – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Table A.8.3.2.

Float voltage	Cable connections	Terminals
Electrolyte gravity	Electrolyte level	Replace cell or battery

2. **Stored Electrical Energy Emergency and Standby Power Systems – Maintenance – As Per Manufacturer's Recommendations - {Reference C12B6} –** ECE – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Table A.8.3.2.

Power supply voltage	Terminals	Panel meters
Panel lamps	Circuit breakers, fuses	

3. **Stored Electrical Energy Emergency and Standby Power Systems – Maintenance – As Per Manufacturer's Recommendations - {Reference C12B6} –** Battery Charger – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Table A.8.3.2.

Output terminal volts	Fuses	Charge current
Equalize voltage	Panel meters	Panel lamps

4. **Stored Electrical Energy Emergency and Standby Power Systems – Maintenance – As Per Manufacturer's Recommendations - {Reference C12B6} –** Load – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Table A.8.3.2.

Load current	Panel meters

5. **Stored Electrical Energy Emergency and Standby Power Systems – Maintenance – As Per Manufacturer's Recommendations - {Reference C12B6} –** Transfer switch – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Table A.8.3.2.

Contacts	Test switch

6. **Stored Electrical Energy Emergency and Standby Power Systems – Maintenance – As Per Manufacturer's Recommendations - {Reference C12B6} –** Fuel cell – Provide documentation showing compliance with approved maintenance and operational testing program or the requirements of Table A.8.3.2.

Check fuel supply (pressure/quantity)	Start up system	Exercise load until system heats up
Fuel supply piping	Exhaust piping	Air supply piping
Cooling system	Connectors	Fuel system pressure/leakage
Full load test	Calibrate H2 detector	

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

CHAPTER 13 – MEANS OF EGRESS

General Requirements for Means Of Egress (applicable at all facilities)

IFCNJ 2015 1031.1	An exit shall not be utilized for any purpose that interferes with its function as a means of egress, except as otherwise approved. The means of egress from each part of the structure, including exits, stairways, egress doors and any panic hardware installed thereon, aisles, corridors, passageways and similar elements of the means of egress, shall at all times be maintained in a safe condition and available for immediate utilization and free of all obstructions. Security devices affecting means of egress shall be subject to approval.
IFCNJ 2015 1031.1.1	Storage. Combustible or flammable material shall not be placed, stored or kept in any portion of an exit, elevator car or hoist way, or at the bottom of a stairway, fire escape or other means of escape, unless such space is enclosed and protected as required by the construction code in effect at the time of first occupancy. Such storage shall be located so the presence or burning of the materials will not obstruct or render hazardous the means of egress.
NYCFC 2014 1027.3	Unobstructed and unimpeded egress required. All required means of egress, including each exit, exit access and exit discharge, shall be continuously maintained free from obstructions and impediments to immediate use in the event of fire or other emergency.
FCNYS 2020 1031.2	Reliability. Required exit accesses, exits and exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency where the building area served by the means of egress is occupied. An exit or exit passageway shall not be used for any purpose that interferes with a means of egress.
NYCFC 2014 1027.3.4	Overcrowding. Premises shall not be caused, allowed or maintained in such a manner as to become overcrowded, such that the number of persons present on the premises and/or their location thereon obstructs or impedes access to any means of egress.
FCNYS 2020 1031.2.1	Security Devices and Egress Locks. Security devices affecting means of egress shall be subject to approval of the fire code official. Security devices and locking arrangements in the means of egress that restrict, control, or delay egress shall be installed and maintained as required by this chapter.
IFCNJ 2015 1031.4	Continued maintenance. All means of egress devices and safeguards that are required by this chapter or that were required by a previous statute or another code when the structure was erected, altered or repaired, shall be maintained in good working order.
FCNYS 2020 1031.3	Obstructions. A means of egress shall be free from obstructions that would prevent its use, including the accumulation of snow and ice.
IFCNJ 2015 1031.6	Exterior egress. All exit discharge, exterior stairways and fire escapes shall be kept free of snow and ice. Any fire escape or exterior stairway found to be in a state of deterioration or determined to be unsafe by the fire official shall be repaired immediately. Depending upon the structural condition, a load test of any fire escape shall be conducted before the escape is returned to service in accordance with the N.J.A.C. 5:23, the Uniform Construction Code.
NYCFC 2014 1027.6	Fire escapes. Fire escapes, and access thereto, shall be maintained in a safe and operational condition, and continuously maintained free from obstructions and impediments to immediate use in the event of fire or other emergency.
NYCFC 2014 1027.6.1	Maintenance. All fire escape components shall be painted or otherwise protected from deterioration and all moving parts shall be maintained in good working order.
NYCFC 2014 1027.6.2	Window gates. Bars, grilles, grates or similar devices placed over windows or other openings onto fire escapes shall be maintained in good working order.

NYCFC 2014 1027.6.3	Air conditioners. An air conditioner shall not be installed in a window providing access to a fire escape unless such fire escape may be accessed from another window in the same room that is unobstructed and of the size required for such purpose by the Building Code, New York State Multiple Dwelling Law, or other applicable law, rule or regulation. Air conditioners installed in windows adjoining fire escapes shall not obstruct the path of egress on the fire escape.
NYCFC 2014 1027.6.4	Fire escape ladders. The operation of a fire escape ladder, including a drop ladder that is lowered vertically to the ground, or a counterbalanced stair ladder which swings to the ground, shall not be obstructed by awnings, stationary furniture, portable fueled space heaters, parked cars, or other obstructions. Where construction work is being performed at a location adjoining a fire escape, provision shall be made for safe egress from the fire escape ladder.
FCNYS 2020 1031.4	Exit Signs. Exit signs shall be installed and maintained in accordance with the building code that was in effect at the time of construction and the applicable provisions in Section 1104. Decorations, furnishings, equipment or adjacent signage that impairs the visibility of exit signs, creates confusion or prevents identification of the exit shall not be allowed.
NYCFC 2014 1027.7	Nonexit door identification. Any door that is not an exit or otherwise part of the means of egress from a building, structure or premises, but which, by reason of its proximity or similar construction, can be confused with an exit door or other door that is part of the means of egress, shall be identified with an approved sign that reads “Not An Exit” and identifies the room into which the nonexit door provides access.
IFCNJ 2015 1031.9	Finishes, furnishings and decorations. Means of egress doors shall be maintained in such a manner as to be distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Furnishings, decorations or other objects shall not be placed so as to obstruct exits, access thereto, egress therefrom, or visibility thereof. Hangings and draperies shall not be placed over exit doors or otherwise be located to conceal or obstruct an exit. Mirrors shall not be placed on exit doors. Mirrors shall not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.
NYCFC 2014 1027.3.6	Corridor storage. It shall be unlawful to store combustible materials or combustible waste in corridors except as authorized by FC1027.4 or other provision of this code or by the commissioner by rule.
IFCNJ 2015 1031.10	Display. Aisles, passageways or stairways in any structure shall not be obstructed with tables, showcases, holiday displays, vending machines or other obstructions during hours when the structure is open to the public, nor shall such obstructions be located in such a manner as to interfere with fire-fighting access. Display boards, signs, coat racks and any other movable equipment that obstructs the path of egress travel shall be prohibited. A mirror shall not be placed in or adjacent to any means of egress in such a manner as to confuse the direction of egress. Draperies and similar hangings shall not obscure an exit.
FCNYS 2020 1031.7	Emergency Escape and Rescue Openings Required emergency escape and rescue openings shall be maintained in accordance with the that was code in effect at the time of construction, and both of the following: 1. Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools. 2. Bars, grilles, grates or similar devices are allowed to be placed over emergency escape and rescue openings provided that the minimum net clear opening size complies with the code that was in effect at the time of construction and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.
FCNYS 2020 1031.9	Floor Identification Signs. The floor identification signs required by Sections 1023.9 and 1104.24 shall be maintained in an approved manner.

A1. Existing Emergency Lighting Systems General Information — Update — Form PA 4116

Frequency – Annually

Review General Information Form for all Emergency Lighting Systems, update as required.

A2. Existing Exit Sign General Information — Update — Form PA 4115

Frequency – Annually

Review General Information Form for all Exit Signs, update as required.

A3. New or Altered Emergency Lighting Systems - General Information — Update — Form PA 4116

Frequency – Annually

Complete General Information Form for new Emergency Lighting Systems or update General Information Form for Emergency Lighting Systems that have been altered to include repairs and/or modifications to components.

A4. New or Altered Exit Signs General Information — Update — Form PA 4115

Frequency – Annually

Complete General Information Form for new Exit Signs or update General Information Form for Exit Signs that have been altered to include repairs and/or modifications to components.

A5. Emergency Lighting — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 1031.10.1	NJ NYS Monthly	Activation Test Emergency lighting equipment shall be tested monthly for a duration of not less than 30 seconds. The test shall be performed manually or by an automated self-testing and self-diagnostic routine. Where testing is performed by self-testing and self-diagnostics, a visual inspection of the emergency lighting equipment shall be conducted monthly to identify any equipment displaying a trouble indicator or that has become damaged or otherwise impaired.	PA 4117
FCNYS 2020 1031.10.2	NJ NYS Annually	Power Test Battery-powered emergency lighting equipment shall be tested annually by operating the equipment on battery power for not less than 90 minutes.	PA 4117

A6. Exit Signs — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 604.4.1.1	NJ Monthly / Annually	Testing Required emergency lighting systems, including exit signs, shall be tested for proper operation for a minimum of 30 seconds every month. An annual test shall be conducted for existing installations. Backup power shall be maintained in accordance with the original approval, for at least 1 hour or 90 minutes. Equipment shall function properly for the duration of these tests.	PA 4117

A7. Luminous Egress Path Markings — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCBC 2014 1024.9	NYC Annually	Maintenance program. Owners shall keep the required luminous egress path markings in good repair. At a minimum, owners shall, every 12 months, perform a visual inspection of the markings with the normal lighting turned on. Markings that are missing, damaged, loose, or that show signs of wear or missing labels shall be noted and promptly repaired. The log of such inspections, including the results and any corrective measures taken, shall be kept and maintained on the premises for inspection by the department and the Fire Department. The log shall contain the date of inspection and the printed name and signature of the person performing the inspection.	PA 4118

A8. Two-Way Communication Systems — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 1031.8.	NJ NYS Annually	Inspection, Testing and Maintenance Two-way communication systems for areas of refuge shall be inspected and tested on a yearly basis to verify that all components are operational. Where required, the tests shall be conducted in the presence of the fire code official. Records of inspection, testing and maintenance shall be maintained.	PA 4118

MEANS OF EGRESS **PA 4115 / 12-20**
GENERAL INFORMATION – EXIT SIGNS

Building ID: **Total Number of Exit Signs:**

1. Exit Sign Identification - Provide unique identifier for each Exit Sign. Do not include Exit Door Tactile Signs. Do include illuminated Floor Proximity Exit Signs
2. Provide location of Exit Sign.
3. Identify Type of Exit Sign - Internally/Externally Illuminated, Photoluminiscent, Phosphorescent, etc. Also indicate if sign is a directional sign with indicating arrow.
4. Provide any other information in Notes. Use reverse side of form if necessary.

Sign ID	Location	Type of Sign	Notes

MEANS OF EGRESS
GENERAL INFORMATION – EMERGENCY LIGHTING

PA 4116 / 12-20

Building ID: **Total Number of Emergency Lighting Systems:**

1. Emergency Lighting System Systems – Provide unique identifier for each emergency lighting fixture.
2. Identify location(s) where Emergency Lighting fixture is provided.
3. Identify Type of fixture.
4. Identify Emergency Power Source for emergency lighting fixture. If powered through an emergency power circuit, identify the circuit.
5. Provide any other information in Notes. Use reverse side of form if necessary.

Emergency Lighting ID	Location	Type of Fixture	Emergency Power Source	Notes

MEANS OF EGRESS
EMERGENCY LIGHTING/EXIT SIGNS – INSPECTION / TESTING / MAINTENANCE

PA 4117 / 12-20

Building ID: **Number of Emergency Lighting Systems:**

- Use this form to document inspection and testing of emergency lighting and exit signs.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Emergency Lighting – Testing – Monthly – {Reference C13A5}** – Emergency lighting equipment shall be tested monthly for a duration of not less than 30 seconds.

2. **Battery Powered Emergency Lighting – Testing – Annually – {Reference C13A5}** – Battery-powered emergency lighting equipment shall be tested annually by operating the equipment on battery power for not less than 90 minutes.

3. **Exit Signs – Testing – Monthly – {Reference C13A6} -** Required emergency lighting systems, including exit signs, shall be tested for proper operation for a minimum of 30 seconds every month.

4. **Exit Signs – Testing – Annually – {Reference C13A6} -** An annual test shall be conducted for existing installations. Backup power shall be maintained in accordance with the original approval, for at least 1 hour or 90 minutes. Equipment shall function properly for the duration of these tests.

S = Satisfactory **U = Unsatisfactory**

Equipment ID	Date	Inspector	Task/Result	Notes

MEANS OF EGRESS

PA 4118 / 12-20

LUMINOUS EGRESS PATH MARKINGS – INSPECTION / MAINTENANCE
TWO-WAY COMMUNICATION SYSTEMS - INSPECTION / TESTING / MAINTENANCE

Building ID:

- Use this form to document inspection and testing of luminous egress path markings.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Luminous Egress Path Markings – Inspection/Maintenance – Annually – {Reference C13A7} –** At a minimum, owners shall, every 12 months, perform a visual inspection of the markings with the normal lighting turned on. Markings that are missing, damaged, loose, or that show signs of wear or missing labels shall be noted and promptly repaired.

2. **Two-Way Communication Systems – Inspection/Testing/Maintenance – Annually – {Reference C13A8} -** Two-way communication systems for areas of refuge shall be inspected and tested on a yearly basis to verify that all components are operational. Where required, the tests shall be conducted in the presence of the fire code official. Records of inspection, testing and maintenance shall be maintained.

S = Satisfactory **U = Unsatisfactory**

Path Marking ID (Identify location and type of marking) or **Communication System ID** (Identify areas system covers)	**Date**	**Inspector**	**Result**	**Notes**

CHAPTER 14 – FIRE DOORS AND OTHER OPENING PROTECTIVES

General Requirements for Fire Doors And Other Opening Protectives (applicable at all facilities)

IFCNJ 2015 703.1.3	Fire Walls, Fire Barriers and Fire Partitions. Required fire walls, fire barriers and fire partitions shall be maintained to prevent the passage of fire. Openings protected with approved doors or fire dampers shall be maintained in accordance with NFPA 80.
FCNYS 2020 705.2	Inspection and Maintenance. Opening protectives in fire-resistance-rated assemblies shall be inspected and maintained in accordance with NFPA 80. Opening protectives in smoke barriers shall be inspected and maintained in accordance with NFPA 80 and NFPA 105. Openings in smoke partitions shall be inspected and maintained in accordance with NFPA 105. Fire doors and smoke and draft control doors shall not be blocked, obstructed, or otherwise made inoperable. Fusible links shall be replaced promptly whenever fused or damaged. Opening protectives and smoke and draft control doors shall not be modified.
FCNYS 2020 705.2.2	Signs. Where required by the fire code official, a sign shall be permanently displayed on or near each fire door in letters not less than 1 inch (25 mm) high to read as follows: • For doors designed to be kept normally open: FIRE DOOR—DO NOT BLOCK. • For doors designed to be kept normally closed: FIRE DOOR—KEEP CLOSED.

A Fire Doors

A1. Existing Fire / Smoke Doors General Information — Update — Form PA 4120

Frequency – Annually

Review General Information Form for all Fire / Smoke Doors, update as required.

A2. New or Altered Fire / Smoke Doors General Information — Update — Form PA 4120

Frequency – As Required

Review General Information Form for new Fire / Smoke Doors or update General Information Form for Fire Doors that have been altered to include repairs and/or modifications to components.

A3. Fire Doors — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 5.2.4.1*	Annually	Periodic inspections and testing shall be performed not less than annually.	PA 4123
NFPA 80 2016 A.5.2.4.1		Doors subject to high-volume use and abuse might warrant an increased frequency of inspection. Components including, but not limited to, hinges, catches, closers, latches, and stay rollers are especially subject to wear.	
NFPA 80 2016 A.5.1		Fire doors, fire shutters, and fire windows are designed to protect the opening under normal conditions of use, with clear spaces on both sides of the opening. Typically, fire doors, fire shutters, and fire windows will provide a lesser rating than the wall and generally allow heat	

		transmission through the assembly. Combustible materials should not be piled against or near the door, window, or shutter.	
NFPA 80 2016 5.1.2.1*		Doors, shutters, and windows shall be operable at all times.	
NFPA 80 2016 A.5.1.2.1		Operability issues may include proper operation and function of latching hardware and closing devices. Latching hardware should not be modified to prevent positive latching.	
NFPA 80 2016 5.1.2.2		Doors, shutters, and windows shall be kept closed and latched or arranged for automatic closing.	
NFPA 80 2016 5.1.2.3.1		Door openings and their surrounding areas shall be kept clear of anything that could obstruct or interfere with the free operation of the door.	
NFPA 80 2016 5.1.2.3.3		Blocking or wedging of doors in the open position shall be prohibited.	
NFPA 80 2016 A.5.2		Doors, shutters, and windows are of no value unless they are properly maintained and closed or are able to close at the time of fire. A periodic inspection and maintenance program is generally the responsibility of the building owner.	
NFPA 80 2016 5.2.4.2		As a minimum, the provisions of 5.2.3 shall be included in the periodic inspection and testing procedure.	
NFPA 80 2016 5.2.4.3		Inspection shall include an operational test for automatic-closing doors and windows to verify that the assembly will close under fire conditions.	
NFPA 80 2016 5.2.4.4		The assembly shall be reset after a successful test.	
NFPA 80 2016 5.2.4.5		Resetting of the release mechanism shall be done in accordance with the manufacturer's instructions.	
NFPA 80 2016 5.2.4.6*		Hardware shall be examined, and inoperative hardware, parts, or other defective items shall be replaced without delay.	
NFPA 80 2016 A.5.2.4.6		The determination of the time required for corrective action should be based on a risk analysis and availability of replacement materials.	
NFPA 80 2016 5.2.4.7		Tin-clad and kalamein doors shall be inspected for dry rot of the wood core.	
NFPA 80 2016 5.2.4.8		Chains or cables employed shall be inspected for excessive wear, stretching, and binding.	
NFPA 80 2016 5.2.3.2*		Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.	
NFPA 80 2016 A.5.2.3.2		Any fire door or fire window assembly or component that has a history of reoccurring failures should be evaluated for possible replacement or other corrective measures.	
NFPA 80 2016 5.2.3.8*		Fusible links, release devices, and any other moveable parts shall not be painted or coated with other materials that could interfere with the operation of the assembly.	
NFPA 80 2016 A.5.2.3.8		Movable parts of the door assembly can include, but are not limited to, stay rollers, gears, and closing mechanisms.	
NFPA 80 2016 5.2.2.4		A record of all inspections and testing shall be provided that includes, but is not limited to, the following information: (1) Date of inspection (2) Name of facility (3) Address of facility (4) Name of person(s) performing inspections and testing (5) Company name and address of inspecting company (6) Signature of inspector of record (7) Individual record of each inspected and tested fire door assembly (8) *Opening identifier and location of each inspected and tested fire door assembly (9) *Type and description of each inspected and tested fire door assembly (10) *Verification of visual inspection and functional operation (11) Listing of deficiencies in accordance with 5.2.3, Section 5.3, and Section 5.4	
NFPA 80 2016 A.5.2.2.4(8)		Each fire door assembly inspected and tested should be assigned a unique identifier code (e.g., door number as assigned by the facility) that can be used to track the assembly's compliance and maintenance records throughout the lifetime of its installation. Identifier codes could be a door assembly number, barcode, or other code that is unique to each fire door assembly.	
NFPA 80 2016 A.5.2.2.4(9)		To aid the AHJ during the review of the inspections and testing reports, the records should include a description of the type of fire door assembly as follows: Type 6: Swinging door with builders hardware Type 7: Swinging fire door with fire door hardware Type 8: Horizontally sliding fire door Type 9: Special purpose horizontally accordion or folding door Type 10: Vertically sliding fire door Type 11: Rolling steel door Type 12: Fire shutter Type 13: Service counter fire door	

		Type 14: Hoistway doors for elevators and dumbwaiter Type 15: Chute door Type 16: Access door Type 17: Fire window	
NFPA 80 2016 A.5.2.2.4(10)		Functional operation of fire door assemblies should include testing of the closing device, complete closure of the fire door, and full engagement of latch(es) where required by door type. Functional testing of automatic-closing or power-operated fire door assemblies and electrically controlled latching hardware or release devices might need to be coordinated with the facility during other electrically controlled system tests.	

A4. Fire Doors – Closing Devices — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 5.2.3.7.1	Annually	All fire doors, fire shutters, and fire window assemblies shall be inspected and tested to check for proper operation and full closure.	PA 4123
NFPA 80 2016 5.2.3.7.2		Resetting of the automatic-closing device shall be done in accordance with the manufacturer's instructions.	
FCNYS 2020 705.2.3		Hold-Open Devices and Closers – Hold-open devices and automatic door closers, where provided, shall be maintained. During the period that such device is out of service for repairs, the door it operates shall remain in the closed position.	
FCNYS 2020 705.2.5		Smoke- And Heat-Activated Doors – Smoke-activated doors shall be maintained to self-close or automatically close upon detection of smoke. Existing fusible-link-type automatic door-closing devices are permitted if the fusible link rating does not exceed 135°F (57°C).	

A5. Fire Doors — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 5.5.1*	Annually or As Required	Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.	PA 4123 PA 4124
NFPA 80 2016 A.5.5.1		The determination of the time required for corrective action should be based on a risk analysis and availability of replacement materials.	
NFPA 80 2016 5.5.2		Damaged glazing material shall be replaced with labeled glazing.	
NFPA 80 2016 5.5.3		Replacement glazing materials shall be installed in accordance with their individual listing.	
NFPA 80 2016 5.5.4		Any breaks in the face covering of doors shall be repaired without delay.	
NFPA 80 2016 5.5.5		Where a fire door, frame, or any part of its appurtenances is damaged to the extent that it could impair the door's proper emergency function, the following actions shall be performed: (1) The fire door, frame, door assembly, or any part of its appurtenances shall be repaired with labeled parts or parts obtained from the original manufacturer. (2) The door shall be tested to ensure emergency operation and closing upon completion of the repairs.	
NFPA 80 2016 5.5.6		If repairs cannot be made with labeled components or parts obtained from the original manufacturer or retrofitted in accordance with Section 5.3, the fire door frame, fire door assembly, or appurtenances shall be replaced.	
NFPA 80 2016 5.5.7		When fastener holes are left in a door or frame due to changes or removal of hardware or plant-ons, the holes shall be repaired by the following methods: (1) Install steel fasteners that completely fill the holes. (2) Fill the screw or bolt holes with the same material as the door or frame. (3) Fill holes with material listed for this use and installed in accordance with the manufacturer's procedures.	
NFPA 80 2016 5.5.8		Holes, other than those as described by 5.5.7, shall be treated as a field modification in accordance with 5.1.4.	
NFPA 80 2016 5.5.9*		Upon completion of maintenance work, fire door assemblies shall be inspected and tested in accordance with 5.2.3. A record of these inspections and testing shall be made in accordance with 5.2.2. A record of maintenance performed on existing fire door assemblies shall be provided that includes the following information:	

		(1) Date of maintenance (2) Name of facility (3) Address of facility (4) Name of person(s) performing maintenance (5) Company name and address of maintenance personnel (6) Signature of maintenance personnel performing the work (7) Individual listings of each inspected and tested fire door assembly (8) *Opening identifier and location of each repaired fire door assembly (9) *Type and description of each repaired fire door assembly (10) *Description or listing of the work performed on each fire door assembly	
NFPA 80 2016 A.5.5.9		Existing fire door assemblies that have been repaired should be inspected and tested immediately upon completion of the repair work to ensure that they are in compliance with this standard. Records of maintenance work should be maintained with the periodic inspections and testing records for the facility	
NFPA 80 2016 A.5.5.9(8)		See A.5.2.2.4(8).	
NFPA 80 2016 A.5.2.2.4(8)		Each fire door assembly inspected and tested should be assigned a unique identifier code (e.g., door number as assigned by the facility) that can be used to track the assembly's compliance and maintenance records throughout the lifetime of its installation. Identifier codes could be a door assembly number, barcode, or other code that is unique to each fire door assembly.	
NFPA 80 2016 A.5.5.9(9)		See A.5.2.2.4(9).	
NFPA 80 2016 A.5.2.2.4(9)		To aid the AHJ during the review of the inspections and testing reports, the records should include a description of the type of fire door assembly as follows: Type 6: Swinging door with builders hardware Type 7: Swinging fire door with fire door hardware Type 8: Horizontally sliding fire door Type 9: Special purpose horizontally accordion or folding door Type 10: Vertically sliding fire door Type 11: Rolling steel door Type 12: Fire shutter Type 13: Service counter fire door Type 14: Hoistway doors for elevators and dumbwaiter Type 15: Chute door Type 16: Access door Type 17: Fire window	
NFPA 80 2016 A.5.5.9(10)		When maintenance work on an existing fire door assembly is required as the result of a periodic inspections and testing report to correct deficiencies, the maintenance report should reference the inspections and testing report where the deficiencies were cited to show that the follow up work was performed. Descriptions of the work performed on fire door assemblies should document the nature of the work (i.e., replaced surface mounted door closer, installed new gasketing). Where the work performed included field modifications permitted by the laboratory, in accordance with 5.1.5.2 and approved by the AHJ, documentation of the permission and approval should be attached to the maintenance report.	

A6. Fire Doors – Performance Based Option Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 A.5.4	As per Approved Program	See Annex J for information regarding performance-based inspection, testing, and maintenance options for fire door assemblies.	
NFPA 80 2016 5.4.1		As an alternate means of compliance with 5.2.4, subject to the AHJ, fire door assemblies shall be permitted to be inspected, tested, and maintained under a written performance-based program.	
NFPA 80 2016 5.4.2		Goals established under a performance-based program shall provide assurance that the fire door assembly will perform its intended function when exposed to fire conditions.	
NFPA 80 2016 5.4.3		Technical justification for inspection, testing, and maintenance intervals shall be documented in writing.	
NFPA 80 2016 5.4.4		The performance-based option shall include historical data acceptable to the AHJ.	

A7. Swinging Fire Doors — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2014 703.2.3		Door operation. Swinging fire doors shall close from the full-open position and latch automatically. The door closer shall exert enough force to close and latch the door from any partially open position.	
NFPA 80 2016 5.2.3.5.1	Annually	Fire door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly.	PA 4123
NFPA 80 2016 5.2.3.5.2		As a minimum, the following items shall be verified: (1) Labels are clearly visible and legible. (2) No open holes or breaks exist in surfaces of either the door or frame. (3) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped. (4) The door, frame, hinges, hardware, and noncombustible threshold are secured, aligned, and in working order with no visible signs of damage. (5) No parts are missing or broken. (6) Door clearances do not exceed clearances listed in 4.8.4 and 6.3.1.7. (7) The self-closing device is operational; that is, the active door completely closes when operated from the full open position. (8) If a coordinator is installed, the inactive leaf closes before the active leaf. (9) Latching hardware operates and secures the door when it is in the closed position. (10) Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame. (11) *No field modifications to the door assembly have been performed that void the label. (12) Meeting edge protection, gasketing and edge seals, where required, are inspected to verify their presence and integrity. (13) Signage affixed to a door meets the requirements listed in 4.1.4.	

A8. Horizontally Sliding, Vertically Sliding, and Rolling Fire Doors — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
IFCNJ 2015 703.4.	Annually	Testing Horizontal and vertical sliding and rolling fire doors shall be inspected and tested annually to confirm proper operation and full closure. Records of inspections and testing shall be maintained.	PA 4124
NFPA 80 2016 5.2.3.6.1		Fire door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly.	
NFPA 80 2016 5.2.3.6.2		At a minimum, the following items shall be verified: (1) Labels are clearly visible and legible. (2) No open holes or breaks exist in surfaces of either the door or the frame. (3) Slats, endlocks, bottom bar, guide assembly, curtain entry, hood, and flame baffle are correctly installed and intact for rolling steel fire doors. (4) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped. (5) Curtain, barrel, and guides are aligned, level, plumb, and true for rolling steel fire doors. (6) Expansion clearance is maintained in accordance with the manufacturer's listing. (7) Drop release arms and weights are not blocked or wedged. (8) Mounting and assembly bolts are intact and secured. (9) Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing. (10) Smoke detectors, if equipped, are installed and operational. (11) No parts are missing or broken. (12) *Fusible links, if equipped, are in the location; chain/cable, s-hooks, eyes, and so forth, are in good condition; the cable or chain is not kinked, pinched, twisted, or inflexible; and links are not painted or coated with dust or grease.	

		(13) Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame. (14) No field modifications to the door assembly have been performed that void the label. (15) Doors have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).	
NFPA 80 2016 A.5.2.3.6.2(12)		Fusible links should not be coated with any materials such as fireproofing, drywall compound, or spray texturing.	

A9. Rolling Steel Fire Doors — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 5.2.3.7.3.1	Annually	Rolling steel fire doors shall be drop-tested twice.	PA 4124
NFPA 80 2016 5.2.3.7.3.2		The first test shall be to check for proper operation and full closure.	
NFPA 80 2016 5.2.3.7.3.3		A second test shall be done to verify that the automatic-closing device has been reset correctly.	

A10. Rolling Steel Fire Doors – Retrofit Operators — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 5.3.1	As Required	The operator, governor, and automatic-closing device on rolling steel fire doors shall be permitted to be retrofitted with a labeled retrofit operator under the conditions specified in 5.3.2 through 5.3.5.	PA 4124
NFPA 80 2016 5.3.2		The retrofit operator shall be labeled as such.	
NFPA 80 2016 5.3.3		The retrofit operator shall be installed in accordance with its installation instructions and listing.	
NFPA 80 2016 5.3.4		The installation shall be acceptable to the AHJ.	
NFPA 80 2016 5.3.5		The retrofit operator shall be permitted to be provided by a manufacturer other than the original manufacturer of the rolling steel fire door on which it is retrofitted, provided its listing allows it to be retrofitted on that manufacturer's doors.	

B Smoke Doors

B1. Smoke Doors — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 5.2.5.1	Annually	Periodic inspection and testing shall be performed not less than annually.	PA 4126 PA 4127
NFPA 105 2016 5.1.3.1*		Smoke doors shall be operable at all times.	
NFPA 105 2016 A.5.1.3.1		Smoke door assemblies, both fire-rated and non-firerated, should be operable under normal conditions. Operability includes closing easily and completely and, where required, positively latching in the closed position. Operability, in the case of smoke door assemblies, also includes the sealing of the door against the passage of smoke. Fire-rated doors are not required to be operable after exposure to a fire. Similarly, nonfire-rated doors should not be expected to be operable after exposure to a fire.	
NFPA 105 2016 5.1.3.2		Smoke doors shall be kept closed or arranged for automatic closing, unless otherwise permitted.	
NFPA 105 2016 4.5.1		Smoke doors shall be self-closing or automatic closing in accordance with NFPA 80.	
NFPA 105 2016 4.5.2		Automatic closing smoke door assemblies shall be activated by smoke detection installed in accordance with NFPA 72.	

NFPA 105 2016 4.5.3		Devices for the release of smoke doors shall be permitted to be part of an overall system, such as a fire alarm or an automatic extinguishing system, that shall release the door and shall be installed and tested in accordance with NFPA 72.	
NFPA 105 2016 5.2.5.2		As a minimum, the provisions of 5.2.4 shall be included in the periodic inspection and testing procedure.	
NFPA 105 2016 5.2.5.3		Inspection shall include an operational test for automatic-closing doors to verify that the assembly will close under fire conditions.	
NFPA 105 2016 5.2.5.4		The assembly shall be reset after each test.	
NFPA 105 2016 5.2.5.5		Resetting of the release mechanism shall be done in accordance with the manufacturer's instructions.	
NFPA 105 2016 5.2.5.6		Hardware and gaskets shall be inspected annually, and any parts found to be damaged or inoperative shall be replaced without delay.	
NFPA 105 2016 5.2.5.7		Tin-clad and Kalamein doors shall be inspected regularly for dry rot.	
NFPA 105 2016 5.2.2.4		A record of all inspections and testing shall be provided that includes, but is not limited to, the following information: (1) Date of inspection (2) Name of facility (3) Address of facility (4) Name of person(s) performing inspections and testing (5) Company name and address of inspecting company (6) Signature of inspector of record (7) Individual record of each inspected and tested [smoke] door assembly (8) *Opening identifier and location of each inspected and tested [smoke] door assembly (9) *Type and description of each inspected and tested [smoke] door assembly (10) *Verification of visual inspection and functional operation (11) Listing of deficiencies in accordance with 5.2.4	
NFPA 105 2016 A.5.2.2.4(8)		Each smoke door assembly in a facility should be assigned a unique identifier code (e.g., door number) that can be used to track the assembly's compliance and maintenance records throughout the lifetime of its installation. Identifier codes could be a door assembly number, bar code, or other code that is unique to each smoke door assembly in the facility.	
NFPA 105 2016 A.5.2.2.4(9)		To aid the AHJ during the review of the inspections and testing reports, the records should include a description of the smoke door assembly. The following door types are listed in NFPA 80 and could have application under this section: (1) Swinging doors with builders hardware (2) Swinging doors with fire door hardware (3) Horizontally sliding doors (4) Special purpose horizontally sliding accordion or folding doors (5) Vertically sliding fire doors (6) Rolling steel doors (7) Fire shutters (8) Service counter fire doors (9) Hoistway doors for elevators and dumbwaiters (10) Chute doors (11) Access doors (12) Fabric fire safety curtain	
NFPA 105 2016 A.5.2.2.4(10)		Functional operation of smoke door assemblies should include testing of the closing device, complete closure of the door from the full-open position, and full engagement of latch(es) where required by door type. Functional testing of automatic-closing or power-operated smoke door assemblies and electrically controlled latching hardware might need to be coordinated with the facility during other electrically controlled system tests. Where required by other standards, the force to open a door should be recorded using a door pressure gauge.	
NFPA 105 2016 5.2.2.2*		Unless a longer period is required by NFPA 80, records shall be retained for a period of at least 3 years.	
NFPA 105 2016 A.5.2.2.2		In many cases, AHJs are not able to inspect every building in their jurisdiction each year. Inspection and testing records need to be retained during the intervening periods between the AHJ's formal visits to provide evidence that the inspections and testing were performed as required by this standard. Additionally, maintenance records documenting that the necessary corrective actions have been made in accordance with this standard should be stored with the inspection and testing records for the same period of time. Retaining the records for 7 years allows the AHJ to look back over an extended period of time to verify that the smoke door assemblies are being properly maintained.	
NFPA 105 2016 5.2.4.1*		Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.	

NFPA 105 2016 A.5.2.4.1		Any smoke door assembly or component that has a history of recurring failures should be evaluated for possible replacement or other corrective measures.	
NFPA 105 2016 5.5.1		Door openings and the surrounding areas shall be kept clear of anything that could obstruct or interfere with the free operation and full closure of the door.	
NFPA 105 2016 5.5.2		Blocking or wedging of doors in the open position shall be prohibited.	

B2. Smoke Doors – Closing Mechanisms — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 5.6.1		Self-closing and automatic closing devices shall be kept in working condition at all times.	PA 4126
NFPA 105 2016 5.6.2		Care shall be taken to prevent paint accumulation on any movable parts such as, but not limited to, hinges, pivots, closer arms, and latching hardware.	

B3. All Smoke Doors — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 5.4.1*	Annually or As Required	Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.	PA 4126
NFPA 105 2016 A.5.4.1		The determination of the time required for corrective action should be based on a risk analysis and the availability of replacement materials.	
NFPA 105 2016 5.4.2		Fire-rated smoke door assemblies shall also be maintained in accordance with NFPA 80.	
NFPA 105 2016 5.4.3		Damaged glazing material shall be replaced in accordance with the applicable codes.	
NFPA 105 2016 5.4.4		Replacement glazing material shall be installed in accordance with its individual listing, where required, and the manufacturer's listing.	
NFPA 105 2016 5.4.5		Where holes are left in a door or frame due to changes or removal of hardware or plant-ons, the holes shall be sealed to resist the passage of smoke at ambient and elevated temperatures up to 400°F (204°C).	
NFPA 105 2016 5.4.6		Where a smoke door, frame, or any part of its appurtenances is damaged to the extent that it could impair the door assembly's proper emergency function, the following actions shall be performed: (1) The door, frame, door assembly, or any parts of its appurtenances shall be replaced with parts obtained from the original manufacturer. (2) The door shall be tested to ensure emergency operation and closing upon completion of the repairs, in accordance with 5.2.3.	
NFPA 105 2016 5.4.7		If repairs cannot be made with parts obtained from the original manufacturer or retrofitted, the door, the door assembly, or appurtenances shall be replaced.	
NFPA 105 2016 5.2.3.1		Upon completion of maintenance, smoke door assemblies shall be inspected and tested in accordance with 5.2.4.	
NFPA 105 2016 5.2.3.2		A record of these inspections and testing shall be made in accordance with 5.2.2.	
NFPA 105 2016 5.2.3.3		A record of maintenance performed on existing smoke door assemblies shall be provided that includes, but is not limited to, the following information: (1) Date of maintenance (2) Name of facility (3) Address of facility (4) Name of person(s) performing maintenance (5) Company name and address of maintenance personnel (6) Signature of maintenance personnel performing the work (7) Individual listings of each maintained smoke door assembly (8) Opening identifier and location of each repaired smoke door assembly (9) Type and description of each repaired smoke door assembly (10) Description or listing of the work performed on each smoke door assembly	

B4. Smoke Doors – Performance-Based Option Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 5.3.1	As per Approved Plan	As an alternative means of compliance with 5.2.5, subject to the AHJ, smoke door assemblies shall be permitted to be inspected, tested, and maintained under a written performance-based program.	
NFPA 105 2016 5.3.2		Goals established under a performance-based program shall provide assurance that the smoke door assembly will perform its intended function when exposed to fire conditions.	
NFPA 105 2016 5.3.3		The technical justification for inspection, testing, and maintenance intervals shall be documented in writing.	
NFPA 105 2016 5.3.4		The performance-based option shall include historical data acceptable to the AHJ.	
NFPA 105 2016 A.5.3		See Annex B for information regarding performancebased inspection, testing, and maintenance options for smoke door assemblies.	

B5. Swinging Smoke Door Assemblies Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 5.2.4.4.1	Annually	Smoke door assemblies shall be visually inspected from both sides to assess the overall condition of the assembly.	PA 4126
NFPA 105 2016 6.2.		Swinging Doors with Fire Protection Ratings. Fire door assemblies that are intended for use as smoke door assemblies shall also comply with NFPA 80.	
NFPA 105 2016 6.3*		Swinging Doors Without Fire Protection Ratings. Doors without fire protection ratings shall be permitted to be used as smoke door assemblies in door openings not required to be protected by fire doors.	
NFPA 105 2016 A.6.3		Non-fire-rated doors used as smoke doors in door openings that are not required to be protected by fire doors might be constructed of aluminum, fiberglass, hollow metal, steel, wood, or other suitable materials. Generally, non-fire-rated smoke door assemblies are required to be self-closing or automatic closing and swing easily and freely, which requires ball bearing or anti-friction bearing hinges or pivots. Smoke door assemblies are required to have positive latching hardware, unless otherwise specifically exempted by the applicable building, fire, or life safety code.	
NFPA 105 2016 5.2.4.4.2		As a minimum, the following items shall be verified: (1) Labels on fire-rated smoke door assemblies are clearly visible and legible and bear the "S" label marking. (2) Door leaves without fire protection ratings comply with 6.3.1. (3) Door frames comply with 6.3.2. (4) Gasketing along the vertical edges of the door and across the top of the door and, where required, at meeting edges of pairs of doors forms a continuous seal that is not cut, notched, or otherwise modified to accommodate other hardware items. (5) Gasketing materials, where required, are intact and close the gaps between the door and frame to seal the door opening against the passage of smoke. (6) Doors installed in pressurized applications have a bottom seal, where required. (7) Doors equipped with bottom seals that automatically project to fully seal the gap under the door in the closed position do not interfere with the swinging of the door when retracted or the closing of the door when projected. (8) No open holes or breaks exist in the surfaces of either the door or the frame. (9) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped. (10) Glazing materials and vision light kits comply with Sections 6.5 and 6.6. (11) Glazing materials, vision light kits, and glazing beads are continuously sealed. (12) The door, frame, hinges, and other hardware are secured, aligned, and in working order with no visible signs of damage. (13) No parts are missing or broken. (14) Door clearances do not exceed dimensions listed in 6.3.3 when measured on the pull side of the door(s). (15) The self-closing device is operational; that is, the active door completely closes when operated from the full open position. (16) If a coordinator is installed, the inactive leaf closes before the active leaf.	

		(17) Where positive latching is required, latching hardware operates and secures the door when the door is in the closed position. (18) Where door leaves, other than doors arranged for automatic closing, are permitted to be held open with friction door holder devices, the door holder devices comply with 6.3.6.6.	

B6. Horizontally Sliding, Vertically Sliding, and Rolling Smoke Doors — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 5.2.4.5.1	Annually	Smoke door assemblies shall be visually inspected from both sides to assess the overall condition of the door assembly.	PA 4127
NFPA 105 2016 5.2.4.5.2		The following items shall be verified: (1) Labels are clearly visible and legible. (2) No open holes or breaks exist in surfaces of either the door or the frame. (3) Slats, endlocks, bottom bar, guide assembly, curtain entry, hood, and flame baffle are correctly installed and intact for rolling steel fire doors. (4) Gasketing along the perimeter of the door forms a continuous seal that is not cut, notched, or otherwise modified. (5) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped. (6) Curtain, barrel, and guides are aligned, level, plumb, and true for rolling steel fire doors. (7) Expansion clearance is maintained in accordance with manufacturer's listing. (8) Drop release arms and weights are not blocked or wedged. (9) Mounting and assembly bolts are intact and secured. (10) Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing. (11) Smoke detectors, if equipped, are installed and operational. (12) No parts are missing or broken. (13) *Fusible links, if so equipped, are in the location; chain/cable, s-hooks, eyes, and so forth, are in good condition; the cable or chain is not kinked, pinched, twisted, or inflexible; and links are not painted or coated with dust or grease. (14) Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame. (15) No field modifications to the door assembly that void the label have been performed. (16) Doors have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).	
NFPA 105 2016 A.5.2.4.5.2(13)		Fusible links should not be coated with any materials such as fireproofing, drywall compound, or spray texturing.	

C Opening Protectives – Fire Dampers, Smoke Dampers, Radiation Dampers, Combination Fire and Smoke Dampers

C1. Existing Opening Protectives General Information — Update — Form PA 4122

Frequency – Annually

Review General Information Form for all Opening Protectives, update as required.

C2. New or Altered Opening Protectives General Information — Update — Form PA 4122

Frequency – As Required

Complete General Information Form for new Opening Protectives or update General Information Form for Opening Protectives that have been altered to include repairs and/or modifications to components.

C3. Opening Protectives – Fire Dampers, Radiation Dampers, and Combination Fire and Smoke Dampers — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 19.5.1.1	1 Year after Acceptance Testing	Each damper shall be tested and inspected 1 year after acceptance testing.	PA 4125
NFPA 80 2016 19.5.1.2	Every 4 Years thereafter	The test and inspection frequency shall then be every 4 years, except in buildings containing a hospital, where the frequency shall be every 6 years.	PA 4125
NFPA 80 2016 A.19.5		Effects on other building components, systems, and building occupants should be evaluated before testing by qualified personnel.	
NFPA 80 2016 19.5.2.1		All tests shall be completed in a safe manner by personnel wearing personal protective equipment.	
NFPA 80 2016 19.5.2.2*	**Periodic Testing for Fusible Link Operated Dampers.**		
NFPA 80 2016 A.19.5.2.2		Before the fusible link is removed, care should be taken to ensure that no obstructions, including hands, are in the path of the damper blades.	
NFPA 80 2016 19.5.2.2.1		Fusible links or other moveable parts shall not be painted or coated, unless listed by the testing agency.	
NFPA 80 2016 19.5.2.2.2		The fan shall be permitted to be shut off during testing.	
NFPA 80 2016 19.5.2.2.3*		The fusible link shall be removed or activated with the damper in the fully open position.	
NFPA 80 2016 A.19.5.2.2.3		Care should be taken to ensure that there are no obstructions, including hands, in the path of the damper blades before the fusible link is removed.	
NFPA 80 2016 19.5.2.2.4		With the fusible link removed or activated, the damper shall close completely without assistance.	
NFPA 80 2016 19.5.2.2.5		Where the damper is designed with a latch to hold the damper in the fully closed position, the operation of the latch shall be confirmed.	
NFPA 80 2016 19.5.2.2.6		At the completion of the test, the damper shall be returned to the fully open position, and the fusible link shall be reinstalled or replaced.	
NFPA 80 2016 19.5.2.2.7		If the link appears damaged, it shall be replaced with a functionally equivalent link.	
NFPA 80 2016 19.5.2.2.8		At the completion of the test, it shall be verified that the damper is unobstructed and in a fully operational mode.	
NFPA 80 2016 19.5.2.3	**Periodic Testing for Dampers that Do Not Use a Fusible Link to Operate.**		
NFPA 80 2016 19.5.2.3.1*		General. Fans shall not be permitted to be shut down during the test.	
NFPA 80 2016 A.19.5.2.3.1		Where static dampers are used and the system is designed to shut down upon detection, the fans should be permitted to be shut down during testing.	
NFPA 80 2016 19.5.2.3.2		Dampers with Motorized Actuators. Testing of dampers with actuators shall comply with the following procedure: (1) Visually confirm that the damper is in the fully open position. (2) Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper. (3) Visually confirm that the damper closes completely. (4) Reapply electrical power or air pressure to reopen the damper. (5) Visually confirm that the damper is in the fully open position.	

NFPA 80 2016 19.5.3.1		All inspections and testing shall be documented, indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.	
NFPA 80 2016 19.5.3.2		All documentation shall be maintained for at least three test cycles and made available for review by the AHJ.	

C4. Opening Protectives - Fire Dampers, Radiation Dampers, and Combination — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 19.6.1		Reports of changes in airflow or noise from the duct system shall be investigated to verify that they are not related to damper operation.	
NFPA 80 2016 19.6.2*	Annually or As Needed	All exposed moving parts of the damper shall be dry lubricated as required by the manufacturer.	PA 4125
NFPA 80 2016 A.19.6.2		Each damper should be examined to ensure that it is not rusted or blocked, with attention given to hinges and other moving parts.	
NFPA 80 2016 19.6.3		If the damper is not operable, repairs shall begin without delay.	
NFPA 80 2016 19.6.4		Following any repairs, the damper shall be tested for operation in accordance with Section 19.5.	
NFPA 80 2016 19.6.5		All maintenance shall be documented in accordance with 19.5.3.1 and 19.5.3.2.	
NFPA 80 2016 19.6.6		Maintenance of a combination fire/smoke damper shall also meet the maintenance requirements contained in Chapter 6 of NFPA 105.	

C5. Smoke Dampers — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 7.6.1.1		Smoke dampers for dedicated and nondedicated smoke control systems shall be inspected and tested in accordance with NFPA 92.	
NFPA 105 2016 7.6.1.2		Combination fire/smoke dampers shall be inspected and tested in accordance with NFPA 80.	
NFPA 105 2016 7.6.2*		Testing Frequency.	
NFPA 105 2016 A.7.6.2		If the damper is arranged to be activated automatically, such as by a smoke detector or other device or system, the periodic test required by 7.6.2 need not involve initiation of the detector or other device or system. The damper can be actuated and cycled as part of the associated smoke detector testing in accordance with NFPA 72 . However, such testing does not meet all the testing and inspection requirements of NFPA 105. The NFPA 72 testing could be combined with the inspection and testing requirements of NFPA 105, provided that all testing requirements of NFPA 105 are met. If operational issues are discovered during NFPA 72 testing, they should be reported to the building owner for corrective measures as required by NFPA 105. For additional information, refer to NFPA 4.	
NFPA 105 2016 7.6.2.1	1 Year after Installation	Each damper shall be tested and inspected 1 year after installation.	PA 4128
NFPA 105 2016 7.6.2.2*	Every 4 Years therafter	The test and inspection frequency shall then be every 4 years, except in buildings containing a hospital, where the frequency shall be every 6 years.	PA 4128
NFPA 105 2016 A.7.6.2.2		See A.7.6.2.	
NFPA 105 2016 7.6.3.2		Fans shall not be permitted to be shut down during the test.	
NFPA 105 2019 7.6.3.2		Visual Inspection Method. Visual inspection shall include all of the following: (1) Visually confirm that the damper is in the full-open or full-closed position as required by the system design. (2) Command and visually confirm the damper to the fullclosed or full-open position. (3) Restore and visually confirm the damper to the original operating position as required by the system design.	

NFPA 105 2016 7.6.4.1		All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered.	
NFPA 105 2016 7.6.4.2		The documentation shall have space to indicate when and how the deficiencies were corrected.	
NFPA 105 2016 7.6.4.3		All documentation shall be maintained for at least three test cycles and made available for review by the AHJ.	

C6. Smoke Dampers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 7.7.1		Any reports of abrupt changes in airflow or noise from the duct system shall be investigated to verify that it is not related to damper operation.	
NFPA 105 2016 7.7.2*	As per Manufacturer Requirements	All exposed moving parts of the damper shall be dry lubricated as required by the manufacturer.	PA 4128
NFPA 105 2016 A.7.7.2		Each damper should be examined to ensure that it is not rusted or blocked, with particular attention given to hinges and other moving parts.	
NFPA 105 2016 7.7.3		If the damper is not operable, repairs shall begin as soon as possible.	
NFPA 105 2016 7.7.4		Following any repairs, the damper shall be tested for proper operation in accordance with Section 7.6.	
NFPA 105 2016 7.7.5	As per Manufacturer Requirements	Smoke damper actuation shall be initiated at a time interval recommended by the actuator manufacturer.	PA 4128
NFPA 105 2016 7.7.6		All maintenance shall be documented and records shall be retained in accordance with 7.6.4.	

D Fire Protective Curtain Assemblies

D1. Fire Protective Curtain Assemblies — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 21.1.1*		This chapter shall cover the installation, inspection, testing, and maintenance of fire protective curtain assemblies installed to protect vertical openings.	
NFPA 80 2016 A.21.1.1		Fire protective curtain assemblies are not to be confused with fabric fire safety curtain assemblies that are intended for use specifically on proscenium openings.	
NFPA 80 2016 21.9.1	Annually	Periodic inspections and testing of fire protective curtain assemblies shall be performed not less than annually.	PA 4129
NFPA 80 2016 21.9.2		As a minimum, the provisions of Section 21.7 shall be included in the periodic inspection and testing procedure.	
NFPA 80 2016 21.7.2		Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.	
NFPA 80 2016 21.7.4		A record of these inspections and testing shall be made in accordance with Section 21.6.	
NFPA 80 2016 21.7.5		The following items shall be verified: (1) Labels are clearly visible and legible. (2) No open holes or breaks exist in surfaces of the curtain or in the stitching of the curtain. (3) Curtain, guides, and coil are aligned, level, plumb, and true. (4) Mounting and assembly bolts are intact and secured. (5) Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing. (6) Smoke detectors, if equipped, are installed, operational, and in accordance with NFPA 72. (7) No parts are missing or broken. (8) Auxiliary hardware items that interfere or prohibit operation are not installed on the curtain or frame.	

		(9) No field modifications to the fire protective curtain assembly have been performed that void the label. (10) Fire protective curtain assemblies have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).	
NFPA 80 2016 21.7.6		Fire protective curtain assemblies shall be drop-tested twice.	
NFPA 80 2016 21.7.6.1		The first test shall be to check for proper operation and full closure.	
NFPA 80 2016 21.7.6.2		A second test shall be done to verify that the automatic-closing device has been reset correctly.	
NFPA 80 2016 21.7.7		Fusible links, release devices, and other moveable parts shall not be painted or coated with other materials that could interfere with the operation of the assembly.	

D2. Fire Protective Curtain Assemblies Closing Devices — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 21.8.1	Annually	Fire protective curtain assemblies shall be inspected and tested to check for proper operation and full closure.	PA 4129
NFPA 80 2016 21.8.2		Resetting of the automatic-closing device shall be performed in accordance with the manufacturer's instructions.	

D3. Fire Protective Curtain Assemblies — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 80 2016 21.10.1	As Required	Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.	PA 4129
NFPA 80 2016 21.10.2		Any breaks in the face covering of curtains shall be repaired in accordance with manufacturer's requirements without delay.	
NFPA 80 2016 21.10.3		Where a fire protective curtain assembly or any part of its appurtenances is damaged to the extent that it could impair the assembly's proper emergency function, the following actions shall be performed: (1) The fire protective curtain assembly or any part of its appurtenances shall be repaired with labeled parts or parts obtained from the original manufacturer. (2) The fire protective curtain assembly shall be tested to ensure emergency operation and closing upon completion of the repairs.	
NFPA 80 2016 21.10.4		If repairs cannot be made with labeled components or parts obtained from the original manufacturer, the fire protective curtain assembly or appurtenances shall be replaced.	

E Smoke Protective Curtain Assemblies

E1. Smoke Protective Curtain Assemblies — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 8.1.1*		This chapter shall cover the installation, inspection, testing, and maintenance of smoke protective curtain assemblies installed to protect vertical openings.	
NFPA 105 2016 A.8.1.1		Smoke protective curtain assemblies are not to be confused with fabric fire safety curtain assemblies, which are intended for use specifically on proscenium openings.	
NFPA 105 2016 8.9.1	Annually	Periodic inspections and testing of smoke protective curtain assemblies shall be performed not less than annually.	PA 4130
NFPA 105 2016 8.9.2		As a minimum, the provisions of Section 8.7 shall be included in the periodic inspection and testing procedure.	
NFPA 105 2016 8.7.2		Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.	

NFPA 105 2016 8.7.4		A record of these inspections and testing shall be made in accordance with Section 8.6.	
NFPA 105 2016 8.7.5		The following items shall be verified: (1) Labels are clearly visible and legible. (2) No open holes or breaks exist in surfaces of the curtain or in the stitching of the curtain. (3) Curtain, guides, and coil are aligned, level, plumb, and true. (4) Mounting and assembly bolts are intact and secured. (5) Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing. (6) Smoke detectors, if equipped, are installed, operational, and in accordance with NFPA 72 (7) No parts are missing or broken. (8) Auxiliary hardware items that interfere or prohibit operation are not installed on the curtain or frame. (9) No field modifications to the smoke protective curtain assembly have been performed that void the label. (10) Smoke protective curtain assemblies have an average closing speed of not less than 6 in./ sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).	
NFPA 105 2016 8.7.6		Smoke protective curtain assemblies shall be drop-tested twice.	
NFPA 105 2016 8.7.7		Fusible links, release devices, and other movable parts shall not be painted or coated with other materials that could interfere with the operation of the assembly.	

E2. Smoke Protective Curtain Assemblies Closing Devices — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 8.8.1	Annually	Smoke protective curtain assemblies shall be inspected and tested to check for proper operation and full closure.	PA 4130
NFPA 105 2016 8.8.2		Resetting of the automatic-closing device shall be performed in accordance with the manufacturer's instructions.	

E3. Smoke Protective Curtain Assemblies — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 105 2016 8.10.1	As Required	Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.	PA 4130
NFPA 105 2016 8.10.2		Any breaks in the face covering of curtains shall be repaired in accordance with manufacturer's requirements without delay.	
NFPA 105 2016 8.10.3		Where a smoke protective curtain assembly or any part of its appurtenances is damaged to the extent that it could impair the assembly's proper emergency function, the following actions shall be performed: (1) The smoke protective curtain assembly or any part of its appurtenances shall be repaired with labeled parts or parts obtained from the original manufacturer. (2) The smoke protective curtain assembly shall be tested to ensure emergency operation and closing upon completion of the repairs.	
NFPA 105 2016 8.10.4		If repairs cannot be made with labeled components or parts obtained from the original manufacturer, the smoke protective curtain assembly or appurtenances shall be replaced.	

FIRE DOORS AND OTHER OPENING PROTECTIVES

PA 4120 / 12-20

GENERAL INFORMATION – FIRE / SMOKE RATED DOORS

Building ID:

Total Number of Fire Rated Doors: **Total Number of Smoke Rated Doors:**

1. Door Identification - Provide unique identifier for each Fire Rated Door
2. Provide location of Fire Rated Door
3. Identify Type of Fire Door - Swinging, Rolling, Vertical Sliding, Horizontal Sliding, Fire Shutter, etc
4. Document Fire Rating of Door
5. Provide a list of Other Fire Door Components including Mullions or Astragals, Hold Open Devices, Special Locking arrangements, Glazing, etc.
6. Provide any other pertinent information in Notes.

Door ID	Location	Type of Door	Fire/Smoke Rating	Other Door Components	Notes

FIRE DOORS AND OTHER OPENING PROTECTIVES

PA 4121 / 12-20

GENERAL INFORMATION – FIRE / SMOKE RATED CURTAIN ASSEMBLIES

Building ID: **Total Number of Curtain Assemblies:**

1. Curtain Assembly Identification – Provide unique identifier for each curtain assembly.
2. Provide location of curtain assembly.
3. Identify type of curtain assembly
4. Identify fire/smoke rating of curtain assembly.
5. Provide a list of assembly components including Mullions or Astragals, Hold Open Devices, Special Locking arrangements, Glazing, etc.
6. Provide any other pertinent information in Notes.

Curtain ID	Location	Type of Curtain	Fire/Smoke Rating	Other Door Components	Notes

FIRE DOORS AND OTHER OPENING PROTECTIVES

PA 4122 / 12-20

GENERAL INFORMATION – OPENING PROTECTIVES
FIRE DAMPERS, FIRE/SMOKE DAMPERS, SMOKE DAMPERS

Building ID: **Total Number of Fire Dampers:**

Total Number of Fire/Smoke Dampers: **Total Number of Smoke Dampers:**

1. Damper Identification - Provide unique identifier for each Damper
2. Provide location of Damper
3. Identify Type of Damper - Fire Damper, Fire/Smoke Damper, Smoke Damper, Radiation Damper, etc.
4. Document Fire/Smoke Rating of Damper (if applicable)
5. Identify if Damper is a component of a Smoke Management System
6. Provide any other pertinent information in Notes.

Damper ID	Location	Type of Damper	Fire/Smoke Rating	Smoke Management System	Notes

THE PORT AUTHORITY OF NY & NJ

SWINGING FIRE DOORS ASSEMBLIES
INSPECTION / TESTING / MAINTENANCE

PA 4123 / 12-20

Building ID: **Total Number of Fire Rated Doors:**

- Use this form to document inspection, testing, and maintenance of swinging fire doors.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Swinging Fire Doors – Inspection/Testing/Maintenance – Annually – {Reference C14A3, C14A7} –** Perform periodic inspections and tests of all fire doors confirming they are operable, as designed, at all times. Fire door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly. As a minimum, the following items shall be verified:

Labels are clearly visible and legible.	The self-closing device is operational; that is, the active door completely closes when operated from the full open position.
No open holes or breaks exist in surfaces of either the door or frame.	Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped.
No parts are missing or broken.	Meeting edge protection, gasketing and edge seals, where required, are inspected to verify their presence and integrity.
Door clearances do not exceed clearances listed in 4.8.4 and 6.3.1.7.	No field modifications to the door assembly have been performed that void the label.
If a coordinator is installed, the inactive leaf closes before the active leaf.	Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame.
Signage affixed to a door meets the requirements listed in 4.1.4.	Latching hardware operates and secures the door when it is in the closed position.
The door, frame, hinges, hardware, and noncombustible threshold are secured, aligned, and in working order with no visible signs of damage.	

2. **Fire Doors – Closing Devices – Inspection/Testing – Annually –{Reference C14A4} -** All fire doors, fire shutters, and fire window assemblies shall be inspected and tested to check for proper operation and full closure.

3. **Fire Doors – Maintenance – Annually or As Required – Reference C14A5} –** Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.

S = Satisfactory **U = Unsatisfactory**

Fire Door ID	Date	Inspector	Task/Results	Notes
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HORIZONTALLY SLIDING, VERTICALLY SLIDING, ROLLING FIRE DOORS
INSPECTION / TESTING / MAINTENANCE

PA 4124 / 12-20

Building ID: **Total Number of Fire Rated Doors:**

- Use this form to document inspection, testing, and maintenance of horizontally sliding, vertically sliding, and rolling fire doors.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Horizontally Sliding, Vertically Sliding, and Rolling Fire Doors – Inspection/Testing/Maintenance – Annually – {Reference C14A8}** – Perform periodic inspections and tests of all fire doors confirming they are operable, as designed, at all times. Fire door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly. As a minimum, the following items shall be verified:

Labels are clearly visible and legible.	Doors have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).
No parts are missing or broken.	Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped.
Mounting and assembly bolts are intact and secured.	Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame.
No open holes or breaks exist in surfaces of either the door or the frame.	No field modifications to the door assembly have been performed that void the label.
Drop release arms and weights are not blocked or wedged.	Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing.
Smoke detectors, if equipped, are installed and operational.	Curtain, barrel, and guides are aligned, level, plumb, and true for rolling steel fire doors.
Expansion clearance is maintained in accordance with the manufacturer's listing.	Slats, endlocks, bottom bar, guide assembly, curtain entry, hood, and flame baffle are correctly installed and intact for rolling steel fire doors.
*Fusible links, if equipped, are in the location; chain/cable, s-hooks, eyes, and so forth, are in good condition; the cable or chain is not kinked, pinched, twisted, or inflexible; and links are not painted or coated with dust or grease.	

2. **Rolling Steel Fire Doors – Testing – Annually – {Reference C14A9}** – Rolling steel fire doors shall be drop-tested twice. The first test shall be to check for proper operation and full closure. A second test shall be done to verify that the automatic-closing device has been reset correctly.

3. **Rolling Steel Fire Doors – Retrofit Operators – Maintenance – As Required – {Reference C14A10} -** The operator, governor, and automatic-closing device on rolling steel fire doors shall be permitted to be retrofitted with a labeled retrofit operator. The retrofit operator shall be permitted to be provided by a manufacturer other than the original manufacturer of the rolling steel fire door on which it is retrofitted, provided its listing allows it to be retrofitted on that manufacturer's doors.

S = Satisfactory **U = Unsatisfactory**

Fire Door ID	Date	Inspector	Task/Results	Notes

FIRE DAMPERS, RADIATION DAMPERS, COMBINATION FIRE/SMOKE DAMPERS — PA 4125 / 12-20
INSPECTION / TESTING / MAINTENANCE

Building ID: **Total Number of Fire Dampers:**

Total Number of Fire/Smoke Dampers: **Total Number of Radiation Dampers:**

- Use this form to document inspection, testing, and maintenance of fire dampers, radiation dampers, and combination fire/smoke dampers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fusible Link Operated Dampers – Inspection/Testing – 1 Year/4 Years – {Reference C14C3} -** Each damper shall be tested and inspected 1 year after acceptance testing. The test and inspection frequency shall then be every 4 years.
   - The fan shall be permitted to be shut off during testing.
   - The fusible link shall be removed or activated with the damper in the fully open position.
   - With the fusible link removed or activated, the damper shall close completely without assistance.
   - Where the damper is designed with a latch to hold the damper in the fully closed position, the operation of the latch shall be confirmed.
   - At the completion of the test, the damper shall be returned to the fully open position, and the fusible link shall be reinstalled or replaced.
   - If the link appears damaged, it shall be replaced with a functionally equivalent link.
   - At the completion of the test, it shall be verified that the damper is unobstructed and in a fully operational mode.

2. **Dampers that Do Not Use a Fusible Link to Operate – Inspection/Testing – 1 Year/4 Years – {Reference C14C3} –** Each damper shall be tested and inspected 1 year after acceptance testing. The test and inspection frequency shall then be every 4 years. General – Fans shall not be permitted to be shut down during the test. Where static dampers are used and the system is designed to shut down upon detection, the fans should be permitted to be shut down during testing. Testing of dampers with actuators shall comply with the following procedure:
   (1) Visually confirm that the damper is in the fully open position.
   (2) Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.
   (3) Visually confirm that the damper closes completely.
   (4) Reapply electrical power or air pressure to reopen the damper.
   (5) Visually confirm that the damper is in the fully open position.

3. **Dampers – Maintenance – Annually – {Reference C14C4} –** All exposed moving parts of the damper shall be dry lubricated as required by the manufacturer. Each damper should be examined including but not limited to hinges and other moving parts for rust, angle iron is properly installed on all four sides and covers the wall opening, and the damper frame for penetrations by foreign objects.

S = Satisfactory **U = Unsatisfactory**

Damper ID	Date	Inspector	Task/Result	Notes

THE PORT AUTHORITY OF NY & NJ

SWINGING SMOKE DOOR ASSEMBLIES
INSPECTION / TESTING / MAINTENANCE

PA 4126 / 12-20

Building ID: **Total Number of Smoke Doors:**

- Use this form to document inspection, testing, and maintenance of swinging smoke door assemblies.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Swinging Smoke Doors – Inspection/Testing – Annually – {Reference C14B1, C14B5} –** Perform annual inspections and tests of all smoke door assemblies confirming they are operable, as designed, at all times. Smoke door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly. As a minimum, the following items shall be verified:

Labels on fire-rated smoke door assemblies are clearly visible and legible and bear the "S" label marking.	Door leaves without fire protection ratings comply with 6.3.1.
Door frames comply with 6.3.2.	Gasketing along the vertical edges of the door and across the top of the door and, where required, at meeting edges of pairs of doors forms a continuous seal that is not cut, notched, or otherwise modified to accommodate other hardware items.
Gasketing materials, where required, are intact and close the gaps between the door and frame to seal the door opening against the passage of smoke.	Doors installed in pressurized applications have a bottom seal, where required.
Doors equipped with bottom seals that automatically project to fully seal the gap under the door in the closed position do not interfere with the swinging of the door when retracted or the closing of the door when projected.	No open holes or breaks exist in the surfaces of either the door or the frame.
Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped.	Glazing materials and vision light kits comply with Sections 6.5 and 6.6.
Glazing materials, vision light kits, and glazing beads are continuously sealed.	The door, frame, hinges, and other hardware are secured, aligned, and in working order with no visible signs of damage.
No parts are missing or broken.	Door clearances do not exceed dimensions listed in 6.3.3 when measured on the pull side of the door(s).
The self-closing device is operational; that is, the active door completely closes when operated from the full open position.	If a coordinator is installed, the inactive leaf closes before the active leaf.
Where positive latching is required, latching hardware operates and secures the door when the door is in the closed position.	Where door leaves, other than doors arranged for automatic closing, are permitted to be held open with friction door holder devices, the door holder devices comply with 6.3.6.6.

2. **Smoke Doors – Maintenance – Annually or As Required – {Reference C14B3} –** Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.

3. **Smoke Doors – Closing Mechanisms – Maintenance – {Reference C14B2}** – Self-closing and automatic closing devices shall be kept in working condition at all times.

S = Satisfactory **U = Unsatisfactory**

Smoke Door ID	Date	Inspector	Task/Result	Notes

HORIZONTALLY SLIDING, VERTICALLY SLIDING, ROLLING SMOKE DOORS
INSPECTION / TESTING / MAINTENANCE

PA 4127 / 12-20

Building ID: **Total Number of Smoke Doors:**

- Use this form to document inspection, testing, and maintenance of horizontally sliding, vertically sliding, and rolling smoke doors.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Horizontally Sliding, Vertically Sliding, and Rolling Smoke Doors – Inspection/Testing – Annually – {Reference C14B1, C14B6} –** Perform annual inspections and tests of all smoke door assemblies confirming they are operable, as designed, at all times. Smoke door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly. As a minimum, the following items shall be verified:

Labels are clearly visible and legible.	No open holes or breaks exist in surfaces of either the door or the frame.
Slats, endlocks, bottom bar, guide assembly, curtain entry, hood, and flame baffle are correctly installed and intact for rolling steel fire doors.	Gasketing along the perimeter of the door forms a continuous seal that is not cut, notched, or otherwise modified.
Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped.	Curtain, barrel, and guides are aligned, level, plumb, and true for rolling steel fire doors.
Expansion clearance is maintained in accordance with manufacturer's listing.	Drop release arms and weights are not blocked or wedged.
Mounting and assembly bolts are intact and secured.	Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing.
Smoke detectors, if equipped, are installed and operational.	No parts are missing or broken.
*Fusible links, if so equipped, are in the location; chain/cable, s-hooks, eyes, and so forth, are in good condition; the cable or chain is not kinked, pinched, twisted, or inflexible; and links are not painted or coated with dust or grease.	Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame.
No field modifications to the door assembly that void the label have been performed.	Doors have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).

2. **Smoke Doors – Maintenance – Annually or As Required – {Reference C14B3} –** Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.

3. **Smoke Doors – Closing Mechanisms – Maintenance – {Reference C14B2} –** Self-closing and automatic closing devices shall be kept in working condition at all times.

S = Satisfactory **U = Unsatisfactory**

Smoke Door ID	Date	Inspector	Task/Result	Notes

SMOKE DAMPERS
INSPECTION / TESTING / MAINTENANCE

PA 4128 / 12-20

Building ID: **Total Number of Smoke Dampers:**

- Use this form to document inspection, testing, and maintenance of smoke dampers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

Combination fire/smoke dampers shall be inspected and tested in accordance with NFPA 80. Refer to PA Form 4125

1. **Smoke Dampers – Inspection/Testing – 1 Year/4 Years – {Reference C14C5} –** Each damper shall be tested and inspected 1 year after installation. The test and inspection frequency shall then be every 4 years. Fans shall not be permitted to be shut down during the test. Visual inspection shall include all of the following:
   (1) Visually confirm that the damper is in the full-open or full-closed position as required by the system design.
   (2) Command and visually confirm the damper to the full-closed or full-open position.
   (3) Restore and visually confirm the damper to the original operating position as required by the system design.

2. **Smoke Dampers – Maintenance – As per Manufacturer Requirements – {Reference C14C6} –** All exposed moving parts of the damper shall be dry lubricated as required by the manufacturer. Each damper should be examined including but not limited to hinges and other moving parts for rust, angle iron is properly installed on all four sides and covers the wall opening, and the damper frame for penetrations by foreign objects.

3. **Smoke Damper Actuator – Maintenance – As per Manufacturer Requirements – {Reference C14C6}** – Smoke damper actuation shall be initiated at a time interval recommended by the actuator manufacturer.

S = Satisfactory **U = Unsatisfactory**

Smoke Damper ID	Date	Inspector	Task/Result	Notes

FIRE PROTECTIVE CURTAIN ASSEMBLIES
INSPECTION / TESTING / MAINTENANCE

PA 4129 / 12-20

Building ID: **Total Number of Fire Protective Curtain Assemblies:**

- Use this form to document inspection, testing, and maintenance of fire protective curtain assemblies.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

- **Fire protective curtain assemblies are not to be confused with fabric fire safety curtain assemblies that are intended for use specifically on proscenium openings.**

- **Fire protective curtain assemblies shall be drop-tested twice.**
  - The first test shall be to check for proper operation and full closure.
  - A second test shall be done to verify that the automatic-closing device has been reset correctly.

1. **Fire Protective Curtain Assemblies – Inspection/Testing – Annually – {Reference C14D1}** – Periodic inspections and testing of fire protective curtain assemblies shall be performed not less than annually. Before testing, perform a visual inspection to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting. The following items shall be verified:
   (1) Labels are clearly visible and legible.
   (2) No open holes or breaks exist in surfaces of the curtain or in the stitching of the curtain.
   (3) Curtain, guides, and coil are aligned, level, plumb, and true.
   (4) Mounting and assembly bolts are intact and secured.
   (5) Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing.
   (6) Smoke detectors, if equipped, are installed, operational, and in accordance with NFPA 72.
   (7) No parts are missing or broken.
   (8) Auxiliary hardware items that interfere or prohibit operation are not installed on the curtain or frame.
   (9) No field modifications to the fire protective curtain assembly have been performed that void the label.
   (10) Fire protective curtain assemblies have an average closing speed of not less than 6 in./sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).

2. **Fire Protective Curtain Assemblies - Closing Devices – Inspection/Testing – Annually – {Reference C14D2}** – Fire protective curtain assemblies shall be inspected and tested to check for proper operation and full closure.

3. **Fire Protective Curtain Assemblies – Maintenance – As Required – {Reference C14D3} –** Repair any defects that could interfere with operation shall be corrected without delay. Where a fire protective curtain assembly or any part of its appurtenances is damaged to the extent that it could impair the assembly's proper emergency function, the following actions shall be performed:
   (1) The fire protective curtain assembly or any part of its appurtenances shall be repaired with labeled parts or parts obtained from the original manufacturer.
   (2) The fire protective curtain assembly shall be tested to ensure emergency operation and closing upon completion of the repairs.

S = Satisfactory **U = Unsatisfactory**

Curtain ID	Date	Inspector	Task/Result	Notes

SMOKE PROTECTIVE CURTAIN ASSEMBLIES
INSPECTION / TESTING / MAINTENANCE

PA 4130 / 12-20

Building ID: **Total Number of Smoke Protective Curtain Assemblies:**

- Use this form to document inspection, testing, and maintenance of smoke protective curtain assemblies.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

Smoke protective curtain assemblies are not to be confused with fabric fire safety curtain assemblies, which are intended for use specifically on proscenium openings.

Smoke protective curtain assemblies shall be drop-tested twice.

- The first test shall be to check for proper operation and full closure.
- A second test shall be done to verify that the automatic-closing device has been reset correctly.

1. **Smoke Protective Curtain Assemblies – Inspection/Testing – Annually – {Reference C14E1}** – Periodic inspections and testing of smoke protective curtain assemblies shall be performed not less than annually. Before testing, perform a visual inspection to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting. The following items shall be verified:
   (1) Labels are clearly visible and legible.
   (2) No open holes or breaks exist in surfaces of the curtain or in the stitching of the curtain.
   (3) Curtain, guides, and coil are aligned, level, plumb, and true.
   (4) Mounting and assembly bolts are intact and secured.
   (5) Attachments to jambs are with bolts, expansion anchors, or as otherwise required by the listing.
   (6) Smoke detectors, if equipped, are installed, operational, and in accordance with NFPA 72
   (7) No parts are missing or broken.
   (8) Auxiliary hardware items that interfere or prohibit operation are not installed on the curtain or frame.
   (9) No field modifications to the smoke protective curtain assembly have been performed that void the label.
   (10) Smoke protective curtain assemblies have an average closing speed of not less than 6 in./ sec (152 mm/sec) or more than 24 in./sec (610 mm/sec).

2. **Smoke Protective Curtain Assemblies – Closing Devices – Inspection/Testing – Annually – {Reference C14E2}** – Smoke protective curtain assemblies shall be inspected and tested to check for proper operation and full closure.

3. **Smoke Protective Curtain Assemblies – Maintenance – As Required – {Reference C14E3}** – Repair any defects that could interfere with operation shall be corrected without delay. Where a smoke protective curtain assembly or any part of its appurtenances is damaged to the extent that it could impair the assembly's proper emergency function, the following actions shall be performed:
   (1) The smoke protective curtain assembly or any part of its appurtenances shall be repaired with labeled parts or parts obtained from the original manufacturer.
   (2) The smoke protective curtain assembly shall be tested to ensure emergency operation and closing upon completion of the repairs.

S = Satisfactory **U = Unsatisfactory**

Curtain ID	Date	Inspector	Task/Result	Notes

CHAPTER 15 – SMOKE MANAGEMENT SYSTEMS

A. All Smoke Management Systems

FCNYS 2020 909.18.8	Testing for Smoke Control Smoke control systems shall be tested by a special inspector in accordance with Section 1705.18 of the Building Code of New York State.
NFPA 92 2015 8.6.5	The system shall be tested by persons who are thoroughly knowledgeable in the operation, testing, and maintenance of the systems.
NYCFC 2014 909.1.1	Smoke control system maintenance. Smoke control systems shall be maintained in good working order. Periodic testing, inspection and other maintenance shall be performed in accordance with the manufacturer's instructions and FC 909.1.1.1 through 909.1.1.3
IFCNJ 2015 909.20.1	Schedule A routine maintenance and operational testing program shall be initiated immediately after the smoke control system has passed the acceptance tests. A written schedule for routine maintenance and operational testing shall be established. Dedicated smoke control systems shall be inspected and operated at 6-month intervals.
FCNYS 2020 909.20.2	Records Records of smoke control system testing and maintenance shall be maintained. The record shall include the date of the maintenance, identification of the servicing personnel and notification of any unsatisfactory condition and the corrective action taken, including parts replaced.
NYCFC 2014 909.1.1.3	Testing. Operational testing of the smoke control system shall include all components of the system, including initiating devices, fans, dampers, controls, doors and windows. Dedicated smoke control systems shall be tested semiannually. Nondedicated smoke control systems shall be tested annually. All systems shall be tested under both normal power and emergency power.
NYCFC 2014 909.2.1	Post-fire smoke purge system maintenance. Post-fire smoke purge systems shall be maintained in good working order. A record of inspections and tests shall be maintained in accordance with FC107.7.
NFPA 92-2015 8.6.1*	Periodic testing of smoke control equipment shall be performed in accordance with this section.
NFPA 92 2015 A.8.6.1	During the life of the building, maintenance is essential to ensure that the smoke control system will perform its intended function under fire conditions. Proper maintenance of the system should, as a minimum, include periodic testing of all equipment such as initiating devices, fans, dampers, controls, doors, and windows. The equipment should be maintained in accordance with the manufacturer's recommendations. (See NFPA 90A.) Special arrangements might have to be made for the introduction of large quantities of outside air into occupied areas or computer centers when outside temperature and humidity conditions are extreme. Because smoke control systems override limit controls, such as freezestats, tests should be conducted when outside air conditions will not cause damage to equipment and systems.

A1. Existing Smoke Management Systems — Update — Form PA 4131

Frequency – Annually

Review General Information Form for all Smoke Management Systems, update as required.

A2. New or Altered Smoke Management Systems — Update — Form PA 4131

Frequency – As Required

Complete General Information Form for new Smoke Management Systems or update General Information Form for Smoke Management Systems that have been altered to include repairs and/or modifications to components.

Confirm that operating and maintenance instructions, maintenance manuals, and a full set of drawings are provided as required.

NFPA 92 2015 7.3.2 — Copies of the operations and maintenance manual shall be provided to the owner and the authorities having jurisdiction.

NFPA 92 2015 8.5.1* — Upon completion of acceptance testing, a copy of all operational testing documentation shall be provided to the owner and to the authority having jurisdiction.

NFPA 92 2015 A.8.5.1 — This documentation should include results from the preliminary building inspection, component testing, and acceptance testing

NFPA 92 2015 8.5.2 — Owner's manuals containing complete data on the smoke control system and instructions for operating and maintaining the system shall be provided to the owner.

A3. Dedicated Systems — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS-2020 909.20.4	SemiAnnually	Dedicated Smoke Control Systems – Dedicated smoke control systems shall be operated for each control sequence semiannually. The system shall be tested under standby power conditions.	PA 4132
NFPA 92 2015 8.6.1.1	SemiAnnually	Dedicated systems shall be tested at least semiannually.	PA 4132
NFPA 92 2015 8.6.2		The equipment shall be maintained in accordance with the manufacturer's recommendations.	
NFPA 92 2015 8.6.3		The periodic tests shall determine the airflow quantities and the pressure differences at the following locations: (1) Across smoke barrier openings (2) At the air makeup supplies (3) At smoke exhaust equipment	
NFPA 92 2015 8.6.4		All data points shall coincide with the acceptance test location to facilitate comparison measurements.	
NFPA 92 2015 8.6.5.1		The results of the tests shall be documented in the operations and maintenance log and made available for inspection.	
NFPA 92 2015 8.6.5.2		The smoke control system shall be operated for each sequence in the current design criteria.	
NFPA 92 2015 8.6.5.3		The operation of the correct outputs for each given input shall be observed.	
NFPA 92 2015 8.6.5.4		Tests shall also be conducted under standby power if applicable.	
NFPA 92 2015 8.6.6		Special arrangements shall be considered for the introduction of large quantities of outside air into occupied areas or sensitive equipment spaces when outside temperature and humidity conditions are extreme and when such unconditioned air could damage contents.	

A4. Non-Dedicated Systems Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS-2020 909.20.5	Annually	Nondedicated Smoke Control Systems – Nondedicated smoke control systems shall be operated for each control sequence annually. The system shall be tested under standby power conditions.	PA 4132
NFPA 92 2015 8.6.1.2	Annually	Non-dedicated systems shall be tested at least annually.	PA 4132
NFPA 92 2015 8.6.2		The equipment shall be maintained in accordance with the manufacturer's recommendations.	
NFPA 92 2015 8.6.3		The periodic tests shall determine the airflow quantities and the pressure differences at the following locations: (1) Across smoke barrier openings (2) At the air makeup supplies (3) At smoke exhaust equipment	
NFPA 92 2015 8.6.4		All data points shall coincide with the acceptance test location to facilitate comparison measurements.	
NFPA 92 2015 8.6.5.1		The results of the tests shall be documented in the operations and maintenance log and made available for inspection.	
NFPA 92 2015 8.6.5.2		The smoke control system shall be operated for each sequence in the current design criteria.	
NFPA 92 2015 8.6.5.3		The operation of the correct outputs for each given input shall be observed.	
NFPA 92 2015 8.6.5.4		Tests shall also be conducted under standby power if applicable.	
NFPA 92 2015 8.6.6		Special arrangements shall be considered for the introduction of large quantities of outside air into occupied areas or sensitive equipment spaces when outside temperature and humidity conditions are extreme and when such unconditioned air could damage contents.	

B. Recommended Practices for All Air Conditioning and Ventilating Systems

The following information is provided as guidelines to maintain proper operations of mechanical ventilation systems that are part of smoke management systems. The tasks below are highlighted by NFPA since the continued operation of all components of the ventilation systems are essential to the smoke management system.

NFPA 90A 2015 B.1.1

Owners should develop a greater awareness of the life and property protection abilities of air-conditioning systems and should establish a planned maintenance schedule. Failure to maintain proper conditions of cleanliness in air duct systems and carelessness in connection with repair operations have been important contributing causes of several fires that have involved air-conditioning systems. The recommendations in this annex apply, in general, to the period of operation of the system; systems operating only part of the year should be given a thorough general checkup before starting operation and again after a shutdown.

NFPA 90A 2015 B.1.2

The intervals of testing and maintenance vary widely, depending on the duration of system operation, condition of fresh air, amount of dust in return air, and other factors. The intervals specified in this standard are intended to be the maximum and should be shortened if system conditions warrant.

B1. Filters — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 90A 2015 B.3.1	As Per Manufacturer's Requirements	All air filters should be kept free of excess dust and combustible material. Unit filters should be renewed or cleaned when the resistance to airflow has increased to two times the original resistance or when the resistance has reached a value of recommended replacement by the manufacturer. A suitable draft gauge should be provided for the purpose. Where the filters are of the automatic liquid adhesive type, sludge should be removed from the liquid adhesive reservoir regularly.	PA 4133
NFPA 90A 2015 B.3.2		When filters are replaced, care should be taken to use the proper type and size and to avoid gaps between filter sections, mounting frames, or hardware. Damaged filter sections or media should not be used.	
NFPA 90A 2015 B.3.3		Filters designed and manufactured to be thrown away after use should never be cleaned and reused.	
NFPA 90A 2015 B.3.4		Care should be exercised in the use of liquid adhesives. Use of an adhesive with a low flash point creates a serious hazard.	

B2. Electrical Equipment of Automatic Filters — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 90A 2015 B.3.5	SemiAnnually	Electrical equipment of automatic filters should be inspected semiannually and the operation cycle observed to ensure that the motor, relays, and other controls function as intended. Drive motors and gear reductions also should be inspected at least semiannually and lubricated when necessary.	PA 4133

B3. Fans and Fan Motors — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 90A 2015 B.8.1	Quarterly	Fans and fan motors should be inspected at least quarterly and cleaned and lubricated when necessary. Care should be exercised in lubricating fans to prevent lubricant from running onto the fan blades. Fans also should be checked for alignment and checked to see that they are running freely.	PA 4133
NFPA 90A 2015 B.8.2		The alignment of fan belt drives should be checked, because improper alignment can cause motor overheating as well as premature belt failure.	

B4. Fan Controls — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 90A 2015 B.9	Annually	Fan controls should be examined and activated at least annually to ensure that they are in operable condition.	PA 4133

B5. Inspection and Cleaning of Ducts — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 90A 2015 B.4.1	Quarterly or As Required	Inspections to determine the amount of dust and waste material in the ducts (both discharge and return) should be made quarterly. If, after several inspections, such frequent inspection is determined to be unnecessary, the interval between inspections can be permitted to be adjusted to suit the conditions.	PA 4133
NFPA 90A 2015 B.4.2		Cleaning should be undertaken whenever an inspection indicates the need.	

NFPA 90A 2015 B.4.3		Cooling and heating coils should be cleaned, if necessary, at the time ducts are cleaned. Thorough cleaning of ducts can require scraping, brushing, or other positive means. Vacuum cleaning might not remove dust of an oily or sticky nature or heavy accumulations in the elbows or seams. The amount and kind of dust and dirt depend greatly on the occupancy and the arrangement of the duct system. Additional access doors or panels could be needed to allow complete cleaning of duct systems.	

B6. Inspection and Cleaning of Plenums — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 90A 2015 B.5.1	Monthly or As Required	Apparatus casing and air-handling unit plenums should be inspected monthly. If, after several inspections, such frequent inspection is determined to be unnecessary, the interval between inspections can be adjusted to suit the conditions.	PA 4133
NFPA 90A 2015 B.5.2	Quarterly or As Required	Ceiling cavity plenums, raised floor plenums, and duct distribution plenums should be inspected in a manner similar to that of ducts, beginning with quarterly inspections and adjusting the frequency to suit dirt buildup conditions.	PA 4133
NFPA 90A 2015 B.5.3		Cleaning should be undertaken whenever an inspection indicates the need, especially in common plenums serving more than one fan or system. Where plenum chambers could be used for storage, arrangements, such as keeping the doors locked, should be made to prevent such usage.	

B7. Outside Air Intakes — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 90A 2015 B.7.1	Quarterly or As Required	Conditions outside the outside air intake should be examined at the time ducts are inspected. Items to be noted include the following: (1) Accumulations of combustible material near the intake (2) The presence of buildings or structures that could present an exposure to the intake, allowing smoke and fire to be drawn in (3) The operating condition of any automatic damper designed to protect the opening against exposure fire.	PA 4133
NFPA 90A 2015 B.7.2		Where accumulations of combustible material are noted, they should be removed immediately and arrangements made to avoid such accumulations. Inspections thereafter should be made more frequently. If newly erected exposures are noticed, consideration should be given to the protection at the intake to ensure that it is adequate. (See 4.3.7.)	

SMOKE MANAGEMENT SYSTEMS
GENERAL INFORMATION

PA 4131 / 12-20

Building ID: **System ID:**

Date:

Original System Installation Date:

Dedicated or Non-Dedicated Smoke Management System:

General

Describe Smoke Management System including start of system, zones, pressurized stairs, etc.: _____

_____

_____

_____

_____

Location of Smoke Management System control panel(s)_____

Location of operating and maintenance instructions, maintenance manuals, and full set of drawings:_____

_____

Operating Instructions Posted Yes No

Mechanical Equipment

Number and Identification of Fans, HVAC equipment

Dampers

Number of Dampers in Smoke Management System

List all dampers in the smoke management system.

Operating Staff

Names of Staff Trained to Operate System	Dates of Training

Notes (attach additional paperwork as needed):

SMOKE MANAGEMENT SYSTEMS
INSPECTION / TESTING

PA 4132 / 12-20

Building ID: **Smoke Management System ID:**

- Use this form to document testing of smoke management systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Dedicated Smoke Control System – Testing – {Reference C15A3}** – Semiannually operate dedicated smoke control systems for each control sequence.

2. **Non-Dedicated Smoke Control System – Testing – {Reference C15A4} –** Annually operate dedicated smoke control systems for each control sequence.

- Periodic tests shall determine airflow quantities and the pressure differences at the following locations:
  (1) Across smoke barrier openings
  (2) At the air makeup supplies
  (3) At smoke exhaust equipment
- The smoke control system shall be operated for each sequence in the current design criteria.
- The operation of the correct outputs for each given input shall be observed.
- Tests shall also be conducted under emergency power if applicable.

Confirm that special considerations are made for the introduction of large quantities of outside air into occupied areas or sensitive equipment spaces when outside temperature and humidity conditions are extreme and when such unconditioned air could damage contents.

A test report shall be prepared and made available for inspection. The report must include but is not limited to the test plan, participants and attendees, details of devices activated, observations of proper sequence operations for each designed input, fire alarm printout, operation under emergency power, deficiencies identified, and corrective actions required.

S = Satisfactory **U = Unsatisfactory**

Smoke Control ID	Date	Inspector	Task/Result	Test Report / Notes

Additional Comments

SMOKE MANAGEMENT SYSTEMS
RECOMMENDED PRACTICES FOR VENTILATION SYSTEMS

PA 4133 / 12-20

Building ID: **System ID:**

- Use this form to document inspection/maintenance of AC and Ventilating systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Filters – Inspection/Maintenance – As Per Manufacturer's Requirements – {Reference C15B1} –** As per manufacturer's requirements, inspect and maintain all air filters so that they are kept free of excess dust and combustible material.

2. **Electrical Equipment of Automatic Filters – Inspection/Maintenance – SemiAnnually – {Reference C15B2} –** Semiannually inspect electrical equipment of automatic filters and observe the operation cycle to ensure that the motor, relays, and other controls function as intended. Drive motors and gear reductions also should be inspected at least semiannually and lubricated when necessary.

3. **Fans and Fan Motors – Inspection/Maintenance – Quarterly - {Reference C15B3} –** Fans and fan motors should be inspected at least quarterly and cleaned and lubricated when necessary.

4. **Fan Controls - Inspection/Maintenance – Annually – {Reference C15B4} –** Fan controls should be examined and activated at least annually to ensure that they are in operable condition.

5. **Inspection and Cleaning of Ducts – Inspection/Maintenance – Quarterly – {Reference C15B5} –** Inspections to determine the amount of dust and waste material in the ducts (both discharge and return) should be made quarterly.

6. **Inspection and Cleaning of Plenums – Inspection/Maintenance – Monthly/Quarterly – {Reference C15B6} –** Apparatus casing, air-handling unit plenums, ceiling cavity plenums, raised floor plenums, and duct distribution plenums should be inspected and cleaned whenever an inspection indicates the need, especially in common plenums serving more than one fan or system. Where plenum chambers could be used for storage, arrangements, such as keeping the doors locked, should be made to prevent such usage.

7. **Outside Air Intakes – Inspection/Maintenance – Quarterly – {Reference C15B7} –** Conditions outside the outside air intake should be examined at the time ducts are inspected. Items to be noted include the following:
   (1) Accumulations of combustible material near the intake
   (2) The presence of buildings or structures that could present an exposure to the intake, allowing smoke and fire to be drawn in
   (3) The operating condition of any automatic damper designed to protect the opening against exposure fire.

An inspection/maintenance report shall be prepared for each task and made available for inspection. The report should include all information pertinent to the work performed.

S = Satisfactory **U = Unsatisfactory**

Equipment ID	Date	Inspector	Task/Result	Report / Notes

CHAPTER 16 – PORTABLE FIRE EXTINGUISHERS

GENERAL INFORMATION

For the purposes of this Chapter, the requirements identified are for commercial grade portable fire extinguishers and not residential portable fire extinguishers. Additionally, the requirements for high pressure portable fire extinguishers are not included in this Manual.

Documentation for inspection, testing, and maintenance of portable fire extinguishers is identified by NFPA as:

> Records shall be kept on a tag or label attached to the fire extinguisher, on an inspection checklist maintained on file or by an electronic method that provides a permanent record.

Due to the potential for movement, documentation is normally kept with the extinguisher. For the purposes of this chapter, a choice is available to maintain documentation with tags and/or labels on the portable extinguisher or to use the forms included at the end of this chapter or an acceptable method of electronic documentation. The owner/tenant responsible for maintenance of fire protection systems and equipment must confirm that the method of documentation used is compliant with the information in this Chapter. Tags and/or labels, if used, must capture all required information. The PA Forms in this Chapter are the recommended option in lieu of tags or labels on the extinguishers. Lastly, electronic documentation will be reviewed and any deficiencies identified must be addressed immediately.

General Requirements for Portable Fire Extinguishers (applicable at all facilities)

NYCFC 2014 906.2.	General requirements. Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10. Exceptions: 1. The travel distance to reach a portable fire extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies. 2. In Group I-3, portable fire extinguishers may be provided at staff locations.
FCNYS 2020 906.2.1	Certification of Service Personnel for Portable Fire Extinguishers. Service personnel providing or conducting maintenance on portable fire extinguishers shall possess a valid certificate issued by an approved governmental agency, or other approved organization for the type of work performed.
FCNYS 2020 906.5	Conspicuous Location. Portable fire extinguishers shall be located in conspicuous locations where they will have ready access and be immediately available for use. These locations shall be along normal paths of travel, unless the fire code official determines that the hazard posed indicates the need for placement away from normal paths of travel.
NYCFC 2014 906.6	Unobstructed and unobscured. Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction cannot be completely avoided, signs or other markings shall be provided to indicate the locations of portable fire extinguishers.
FCNYS 2020 906.7.	Hangers and Brackets. Hand-held portable fire extinguishers, not housed in cabinets, shall be installed on the hangers or brackets supplied. Hangers or brackets shall be securely anchored to the mounting surface in accordance with the manufacturer's installation instructions.
NYCFC 2014 906.9.1	Extinguishers weighing 40 pounds or less. Portable fire extinguishers having a gross weight not exceeding 40 pounds (18 kg) shall be installed so that the top of the extinguisher is not more than 5 feet (1524 mm) above the floor.
NYCFC 2014 906.9.2	Extinguishers weighing more than 40 pounds. Hand-held portable fire extinguishers having a gross weight exceeding 40 pounds (18 kg) shall be installed so that the top of the extinguisher is not more than 3.5 feet (1067 mm) above the floor.

NYCFC 2014 906.9.3	Floor clearance. The clearance between the floor and the bottom of installed hand-held portable fire extinguishers shall not be less than 4 inches (102 mm).
FCNYS 2020 906.10	Wheeled Units. Wheeled fire extinguishers shall be conspicuously located in a designated location.
NFPA 10 2018 7.10.1	Fire extinguishers shall not be used for any purpose other than that of a fire extinguisher.
NFPA 10 2018 7.10.2	Fire extinguishers shall not be converted from one type to another, modified, or altered.
NFPA 10 2018 7.10.3	Fire extinguishers shall not be converted for the use of a different type of extinguishing agent.

Applicable in NYC Only (in addition to General Requirements above)

NYCFC 2014 901.6.3.1	Servicing of portable fire extinguishers. It shall be unlawful for any person engaged in the business of servicing portable fire extinguishers to service portable fire extinguishers without a portable fire extinguisher servicing company certificate. Any person that services portable fire extinguishers shall hold a certificate of fitness, except that a person training for such certificate of fitness may service portable fire extinguishers under the personal supervision of a certificate of fitness holder. Nothing in this section shall preclude portable fire extinguishers that are maintained on a premises for use at such premises from being serviced by the owner or occupant of the premises, or an employee of such owner or occupant, who possesses a certificate of fitness for portable fire extinguisher servicing and the tools, materials, equipment and facility necessary to perform such services.
NYCFC 2014 906.5	Conspicuous location. Portable fire extinguishers shall be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations shall be along normal paths of travel, unless the commissioner determines that the hazard posed indicates the need for placement away from normal paths of travel. Exceptions: 1. Portable fire extinguishers subject to theft, malicious use or damage may be located in locations approved by the commissioner. 2. In rooming houses and single room occupancies, as defined in the New York State Multiple Dwelling Law, with over 15 sleeping rooms, a 2-A rated portable fire extinguisher may be kept in the apartment of the manager or the building superintendent.

General Requirements for Portable Extinguishers for Commercial Kitchen Cooking Equipment (applicable at all facilities)

NYCFC 2014 609.6.1	Commercial cooking. Commercial cooking equipment areas shall be provided with a Class K rated portable fire extinguisher.
IFCNJ 2015 906.4	Cooking Grease Fires. Fire extinguishers provided for the protection of cooking grease fires shall be of an approved type compatible with the automatic fire-extinguishing system agent and in accordance with Section 904.12.5.
IFCNJ 2015 904.12.5	Portable Fire Extinguishers for Commercial Cooking Equipment. Portable fire extinguishers shall be provided within a 30-foot (9144 mm) distance of travel from commercial-type cooking equipment. Cooking equipment involving solid fuels or vegetable or animal oils and fats shall be protected by a Class K rated portable extinguisher in accordance with Section 904.12.5.1 or 904.12.5.2, as applicable.

IFCNJ 2015 904.12.5.1

Portable Fire Extinguishers for Solid Fuel Cooking Appliances. Solid fuel cooking appliances, whether or not under a hood, with fireboxes 5 cubic feet (0.14 m3) or less in volume shall have a minimum 2.5-gallon (9 L) or two 1.5-gallon (6 L) Class K wet-chemical portable fire extinguishers located in accordance with Section 904.12.5.

IFCNJ 2015 904.12.5.2

Class K Portable Fire Extinguishers for Deep Fat Fryers. Where hazard areas include deep fat fryers, listed Class K portable fire extinguishers shall be provided as follows:

1. For up to four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity.
2. For every additional group of four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one additional Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity shall be provided.
3. For individual fryers exceeding 6 square feet (0.55 m2) in surface area: Class K portable fire extinguishers shall be installed in accordance with the extinguisher manufacturer's recommendations.

A. All Portable Fire Extinguishers

A1. Existing Portable Fire Extinguishers General Information — Update — Form PA 4135

Frequency – Annually

Review General Information Form for all Portable Fire Extinguishers, update as required.

A2. New or Altered Portable Fire Extinguishers – General Information — Update — Form PA 4135

Frequency – As Required

Complete General Information Form for new Portable Fire Extinguishers or update existing General Information Form for Portable Fire Extinguishers that have been altered to include repairs and/or modifications to components.

B. Portable Fire Extinguisher Inspection

B1. Portable Fire Extinguishers — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NYCFC 2015 906.2.1.1	NYC Monthly	Monthly inspection. An inspection to verify that the portable fire extinguishers are readily available and in good working order shall be conducted at least once a month. The person conducting such inspections shall keep records of all portable fire extinguishers inspected, including the date the inspection was performed, the person performing the inspection, and those portable fire extinguishers found to require corrective action. Such recordkeeping shall be either kept on a tag or label securely attached to the portable fire extinguisher, on an inspection checklist maintained on file or by an approved electronic method that provides a permanent record. Exception: An inspection to verify that the portable fire extinguishers are readily available and in good working order shall be conducted at least once every 3 years for dry-chemical or halogenated agent portable fire extinguishers that are monitored by a listed and approved electronic monitoring device complying with all of the following requirements:	PA 4136

		1. The electronic monitoring device shall continuously confirm the proper location and charge of each portable fire extinguisher so monitored. 2. Loss of power to the electronic monitoring device or other interruption of the proper functioning of such device shall initiate a trouble signal at an approved location on the premises at which the portable fire extinguisher being monitored is installed. 3. The portable fire extinguisher being monitored shall be located indoors or in cabinets outdoors. The portable fire extinguisher being monitored shall not be in a corrosive environment. 4. The periodic inspection of the portable fire extinguisher shall include inspection and testing of the electronic monitoring device. 5. An electronic record that the electronic monitoring of the portable fire extinguisher is being maintained, and that the portable fire extinguisher is properly located and charged, shall be maintained in accordance with FC107.7.	
NFPA 10 2018 7.2.1.1*		Fire extinguishers shall be manually inspected when initially placed in service.	
NFPA 10 2018 A.7.2.1.1		Frequency of fire extinguisher inspections should be based on the need of the area in which fire extinguishers are located. The required monthly inspection is a minimum.	
NFPA 10 2018 7.2.1.2*	Monthly	Fire extinguishers and Class D extinguishing agents shall be inspected either manually or by means of an electronic monitoring device/system at intervals not exceeding 31 days.	PA 4136
NFPA 10 2018 A.7.2.1.2		Inspections should be performed on extinguishers 12 times per year, at regular intervals not exceeding 31 days.	
NFPA 10 2018 7.2.1.2.1	Monthly	Fire extinguishers and Class D extinguishing agents shall be inspected at least once per calendar month.	PA 4136
NFPA 10 2018 7.2.1.3*		Fire extinguishers and Class D extinguishing agents shall be manually inspected daily or weekly when conditions exist that indicate the need for more frequent inspections.	
NFPA 10 2018 A.7.2.1.3		Inspections should be more frequent if any of the following conditions exists: (1) High frequency of fires in the past (2) Severe hazards (3) Susceptibility to tampering, vandalism, or malicious mischief (4) Possibility of, or history of, theft of fire extinguishers (5) Locations that make fire extinguishers susceptible to mechanical injury (6) Possibility of visible or physical obstructions (7) Exposure to abnormal temperatures or corrosive atmospheres (8) Characteristics of fire extinguishers, such as susceptibility to leakage More frequent inspections could be enhanced through electronic monitoring of the fire extinguisher.	
NFPA 10 2018 7.2.1.4		Extinguishers that are electronically monitored for location only, such as those monitored by means of a switch to indicate when the extinguisher is removed from its bracket or cabinet, shall be manually inspected in accordance with 7.2.2.	
NFPA 10 2018 7.2.2		Periodic inspection or electronic monitoring of fire extinguishers shall include a check of at least the following items: (1) Location in designated place (2) Visibility of the extinguisher or means of indicating the extinguisher location. (3) Access to the extinguisher (4) Pressure gauge reading or indicator in the operable range or position (5) Fullness determined by weighing or hefting (6) Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers. (7) Indicator for nonrechargeable extinguishers using push-to-test pressure indicators	
NFPA 10 2018 7.2.2.1		The owner or the owner's agent shall determine the method of extinguisher inspection such as manual inspection, electronic monitoring, or any combination of the two.	
NFPA 10 2018 7.2.2.2		Any method(s) of inspection other than manual inspection shall require the approval of the authority having jurisdiction.	
NFPA 10 2018 7.2.2.3*		In addition to 7.2.2, fire extinguishers shall be visually inspected in accordance with 7.2.2.4 if they are located where any of the following conditions exists: (1) High frequency of fires in the past. (2) Severe hazards (3) Locations that make fire extinguishers susceptible to mechanical injury or physical damage (4) Exposure to abnormal temperatures or corrosive atmospheres.	
NFPA 10 2018 A.7.2.2.3		Fire extinguishers in vehicles should be inspected at the beginning of a shift or whenever the vehicle is used. The inspection should ensure that the extinguisher is charged and ready for use. Extinguishers in compartments or trunks can become damaged or otherwise compromised because of weather exposure, other items in the compartment that are not secured, or other factors.	

NFPA 10 2018 7.2.2.4		Where required by 7.2.2.3, the following inspection procedures shall be in addition to those addressed in 7.2.2: (1) Verify that operating instructions on nameplates are legible and face outward (2) Check for broken or missing safety seals and tamper indicators (3) Examine for obvious physical damage, corrosion, leakage, or clogged nozzle	
NFPA 10 2018 7.2.2.5		Inspection Procedure for Containers of Class D Extinguishing Agent. Periodic inspection of containers of Class D extinguishing agent used to protect Class D hazards shall include verification of at least the following: (1) Located in designated place (2) Visibility of the container or means of indicating the container location (3) Access to the container (4) Lid is sealed (5) Fullness by hefting or weighing (6) No obvious physical damage to container	
NFPA 10 2018 7.2.3		Corrective Action. When an inspection of any fire extinguisher reveals a deficiency in any of the conditions in 7.2.2 or 7.2.2.4, immediate corrective action shall be taken.	
NFPA 10 2018 7.2.3.1		Rechargeable Fire Extinguishers. When an inspection of any rechargeable fire extinguisher reveals a deficiency in any of the conditions in 7.2.2(4), 7.2.2(5), 7.2.2(7), or 7.2.2.4(1) through 7.2.2.4(3), the extinguisher shall be subjected to applicable maintenance procedures.	
NFPA 10 2018 7.2.3.2		Nonrechargeable Dry Chemical Fire Extinguisher. When an inspection of any nonrechargeable dry chemical fire extinguisher reveals a deficiency in any of the conditions listed in 7.2.2(4), 7.2.2(5), 7.2.2(7), or 7.2.2.4(1) through 7.2.2.4(3), the extinguisher shall be removed from further use, discharged, and destroyed at the direction of the owner or returned to the manufacturer.	
NFPA 10 2018 7.2.3.3		Nonrechargeable Halon Agent Fire Extinguisher. When an inspection of any nonrechargeable fire extinguisher containing a halon agent reveals a deficiency in any of the conditions listed in 7.2.2(4), 7.2.2(5), 7.2.2(7), or 7.2.2.4(1) through 7.2.2.4(3), the extinguisher shall be removed from service, shall not be discharged, and shall be returned to the manufacturer, a fire equipment dealer, or a distributor to permit recovery of the halon.	

B2. Electronic Monitoring — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.6.1		The components of the monitoring device/system shall be tested and maintained annually in accordance with the manufacturer's listed maintenance manual, with the following items included as a minimum: (1) Power supply inspection/battery change (2) Obstruction sensor inspection (3) Location sensor inspection (4) Pressure indication inspection (5) Connection continuity inspection (See 7.6.1.1 and 7.6.1.2.)	
NFPA 10 2018 7.6.1.1		One hundred percent of all units shall be tested upon initial installation or reacceptance with verification of receipt of signal at the control panel or a local alarm.	
NFPA 10 2018 7.6.1.2	Annually	Twenty percent of units shall be tested annually on a rotating basis so that all units are tested within a 5-year period.	PA 4142
NFPA 10 2018 7.6.2		When used in conjunction with fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected and maintained in accordance with NFPA 72 and 7.6.1.	
NFPA 10 2018 7.6.3		Corrective Action. When maintenance of any monitoring system reveals a deficiency, immediate corrective action shall be taken.	

B3. Inspection Report Keeping (Manual or Electronic) — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.2.4.1.1		Where manual inspections are conducted, records for manual inspections shall be kept on a tag or label attached to the fire extinguisher, on an inspection checklist maintained on file, or by an electronic method.	
NFPA 10 2018 7.2.4.1.2		Where manual inspections are conducted, the month and year the manual inspection was performed and the initials of the person performing the inspection shall be recorded.	
NFPA 10 2018 7.2.4.1.3		Personnel making manual inspections shall keep records of all fire extinguishers inspected, including those found to require corrective action.	
NFPA 10 2018 7.2.4.1.4		Records for manual inspection shall be kept to demonstrate that at least the last 12 monthly inspections have been performed.	
NFPA 10 2018 7.2.4.2.1		Where electronically monitored systems are employed for inspections, records shall be kept for fire extinguishers found to require corrective action.	
NFPA 10 2018 7.2.4.2.2		Records for electronic monitoring shall be kept to demonstrate that at least the last 12 monthly inspections have been performed.	
NFPA 10 2018 7.2.4.2.3		For electronically monitored fire extinguishers, where the extinguisher causes a signal at a control unit when a deficiency in any of the conditions listed in 7.2.2 occurs, record keeping shall be provided in the form of an electronic event log at the control panel.	

C. Portable Extinguisher Maintenance

C1. Extinguisher Maintenance General Information — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.3.1*		Maintenance Procedures. Where required by another section of this standard, maintenance procedures shall include the procedures detailed in the manufacturer's service manual and a thorough examination of the basic elements of the fire extinguisher, including the following: (1) Mechanical parts of all fire extinguishers (2) Extinguishing agent (3) Expelling means (4) Physical condition	
NFPA 10 2018 A.7.3.1	Annually	The annual maintenance of a fire extinguisher requires the services of a trained and certified technician who has the proper tools, listed parts, and appropriate manufacturer's service manual. Maintenance of fire extinguishers should not be confused with inspection, which is a quick check of the extinguishers that is performed at least every 30 days. Because the detailed maintenance procedures for various extinguisher types and models differ, the procedures specified within service manuals need to be followed.	PA 4137 PA 4138 PA 4139 PA 4140
NFPA 10 2018 7.3.1.1	Annually	Fire extinguishers shall be subjected to maintenance at intervals of not more than 1 year, at the time of hydrostatic test, or when specifically indicated by an inspection discrepancy or electronic notification.	PA 4137 PA 4138 PA 4139 PA 4140

C2. Extinguisher Maintenance — Rechargeable, Stored Pressure, Dry Chemical, Halogenated Portable Extinguishers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 A.7.3.1	Annually	The following list is a sample of maintenance procedures that should be followed to determine deficiencies that require additional attention to remediate the condition of the extinguisher as appropriate for rechargeable, stored-pressure, dry chemical, and halogenated agent hand portable fire extinguishers: (1) Visually examine the extinguisher for damage by removing the extinguisher from the hanger, bracket, or cabinet, and visually examine the extinguisher for damage, including pressure gauge, cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers. (2) Verify that the hanger, bracket, or cabinet is the proper one for the extinguisher. (3) Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted. (4) Verify that the nameplate operating instructions are legible and facing outward. (5) Confirm that the extinguisher model is not subject to recall and is not obsolete. (6) Verify the extinguisher records to determine internal examination and hydrostatic test intervals. Thoroughly examine the cylinder for dents, damage, repairs, or corrosion. (7) Verify the pull pin functions properly and examine for damage or corrosion by removing the pull pin. (8) Verify that the handle and levers are undamaged and operable. (9) Verify that the valve stem is correctly extended and not corroded or damaged. (10) Verify that the pressure gauge or indicator is in the operable range. (11) Verify that the gauge operating pressure corresponds with the nameplate instructions. (12) Verify that the gauge face corresponds with the proper agent type. (13) Verify that the gauge threads are compatible with the valve body material. (14) Verify that the nozzle or hose assembly, or both, is unobstructed, by removing and examining the nozzle. (15) Confirm that the nozzle and hose assembly are correct for the model of extinguisher. (16) Verify that the hose and couplings are not cut, cracked, damaged, or deformed. (17) Examine internal valve port surfaces and threads for signs of leakage or corrosion by removing the nozzle or hose assembly and reinstalling the nozzle and hose assembly securely after examination. (18) Verify that the hose retention band is secure and properly adjusted. (19) Weigh the extinguisher and verify that it corresponds to the weight listed on the nameplate. (20) Reinstall the ring pin and install a new tamper seal. (21) Clean exposed extinguisher surfaces to remove any foreign material. (22) Record the maintenance on the extinguisher tag or label. (23) Return the extinguisher to the hanger, bracket, or cabinet.	PA 4137

C3. Extinguisher Maintenance — Carbon Dioxide Portable Extinguishers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 A.7.3.1	Annually	The following list is a sample of maintenance procedures that should be followed to determine deficiencies that require additional attention to remediate the condition of the extinguisher as appropriate for carbon dioxide hand portable fire extinguishers: (1) Visually examine the extinguisher for damage by removing the extinguisher from the hanger or cabinet, and visually examine the extinguisher for damage, including cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers. (2) Verify that the bracket or cabinet is the proper one for the extinguisher. (3) Verify that the bracket or cabinet is secure, undamaged, and properly mounted. (4) Verify that the nameplate operating instructions are legible and facing outward. (5) Confirm that the extinguisher model is not subject to recall and is not obsolete. (6) Verify the extinguisher records to determine hydrostatic test intervals.	PA 4138

		(7) Verify the pull pin functions properly and examine for damage or corrosion by removing the pull pin. (8) Examine the handle and levers to ensure that they are undamaged and operable. (9) Verify that the valve stem is correctly extended and not corroded or damaged. (10) Verify that the nozzle or hose assembly, or both, is unobstructed, by removing and examining the nozzle. (11) Confirm that the nozzle and hose assembly are correct for the model of extinguisher. (12) Verify that the hose and couplings are not cut, cracked, damaged, or deformed. (13) Examine the discharge port for signs of leakage or corrosion by removing the nozzle or hose assembly and reinstalling the nozzle and hose assembly securely after examination. (14) Conduct a conductivity test on the hose assembly. (15) Affix the conductivity test label to hose assemblies that pass the conductivity test and replace hoses that fail the conductivity test. (16) Verify that the safety assembly is not damaged or blocked. (17) Verify that the hose retention band is secure and properly adjusted. (18) Weigh the extinguisher to verify that it corresponds to the weight listed on the nameplate. (19) Reinstall the ring pin and install a new tamper seal. (20) Clean exposed extinguisher surfaces to remove any foreign material. (21) Record the maintenance on the extinguisher tag or label. (22) Return the extinguisher to the hanger, bracket, or cabinet.	

C4. Extinguisher Maintenance — Maintenance
Pressurized Water Type Portable Extinguishers

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 A.7.3.1	Annually	The following list is a sample of maintenance procedures and checks that are commonly associated with pressurized water-type hand portable fire extinguishers: (1) Visually examine the extinguisher for damage by removing the extinguisher from the hanger, bracket, or cabinet, and visually examine the extinguisher for damage, including pressure gauge, cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers. (2) Verify that the hanger, bracket, or cabinet is the proper one for the extinguisher. (3) Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted. (4) Verify that the nameplate operating instructions are legible and facing outward. (5) Confirm that the extinguisher model is not subject to recall and is not obsolete. (6) Check the extinguisher records to determine hydrostatic test intervals. (7) Verify that the pull pin functions properly and examine for damage or corrosion by removing the pull pin. (8) Examine the handle and levers to ensure that they are undamaged and operable. (9) Verify that the valve stem is correctly extended and not corroded or damaged. (10) Verify that the pressure gauge is in the operable range. (11) Verify that the gauge operating pressure corresponds with the nameplate instructions. (12) Verify that the gauge face corresponds with the proper agent type. (13) Verify that the gauge threads are compatible with the valve body material. (14) Verify that the nozzle or hose assembly, or both, is unobstructed, by removing and examining the nozzle. (15) Confirm that the nozzle and hose assembly are correct for the model of extinguisher. (16) Verify that the hose and couplings are not cut, cracked, damaged, or deformed. (17) Examine the internal valve port surfaces and threads for signs of leakage or corrosion by removing the nozzle or hose assembly and reinstalling the nozzle and hose assembly securely after examination. (18) Verify that the hose retention band is secure and properly adjusted. (19) Weigh the extinguisher to verify that it corresponds to the weight listed on the nameplate. (20) Reinstall the ring pin and install a new tamper seal. (21) Clean exposed extinguisher surfaces to remove any foreign material. (22) Record the maintenance on the extinguisher tag or label. (23) Return the extinguisher to the hanger, bracket, or cabinet.	PA 4139

C5. Extinguisher Maintenance — Cartridge Operated Dry Chemical / Dry Powder Portable Extinguishers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 A.7.3.1	Annually	The following list is a sample of maintenance procedures and checks that are commonly associated with cartridge operated dry chemical and dry powder hand portable fire extinguishers: (1) Visually examine the extinguisher for damage by removing the extinguisher from the hanger, bracket, or cabinet, and visually examine the extinguisher for damage, including pressure gauge, cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers. (2) Verify that the hanger, bracket, or cabinet is the proper one for the extinguisher. (3) Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted. (4) Verify that the nameplate operating instructions are legible and facing outward. (5) Confirm that the extinguisher model is not subject to recall and is not obsolete. (6) Verify the extinguisher hydrostatic test records to determine the hydrostatic test interval. (7) Invert the extinguisher and open the nozzle to ensure any pressure is relieved from the shell. (8) Remove the cartridge guard and check the integral components for damage or corrosion. (9) Unscrew the cartridge to examine the seal. (Replace the cartridge if the seal is punctured, damaged, or corroded.) Verify that the seal is not punctured, that it is the proper cartridge for that extinguisher, and that it has the proper manufacturer's seal. (10) Install the shipping cap on the cartridge. (11) Weigh the cartridge on a scale and verify the weight is within the tolerance specified in the manufacturer's service manual. (12) Remove the discharge nozzle from its holder and lift the hose, breaking the tamper seal. (13) Operate the puncture lever to verify proper operation. (14) Check and clean the pressure relief vent in the cartridge receiver in accordance with manufacturer's service manual. (15) Remove and examine the cartridge receiver gasket. Replace the gasket if brittle, compression set, cracked, cut, or missing. (16) Lubricate the gasket in accordance with the manufacturer's manual and install. (17) Slowly loosen the fill cap to relieve any trapped pressure and reinstall hand-tight. (18) Examine the hose, nozzle, and couplings for any damage. (19) Operate the discharge nozzle to verify proper operation. (20) Remove the nozzle tip in accordance with the manufacturer's service manual and verify the proper tip is installed and that it is not damaged. Install the nozzle tip in accordance with manufacturer's manual. (21) Remove the discharge hose from the extinguisher and ensure that the hose is not obstructed. (22) Examine the hose o-ring and replace if necessary. (23) Verify that the hose connection is clean and not damaged. (24) Install the hose on the extinguisher. (25) Remove the fill cap and examine the threads and seating surfaces for any damage or corrosion. (26) Verify that the pressure relief vent is not obstructed. (27) Verify that the dry chemical agent is the correct type and that there are no foreign materials or caking. (28) Examine and clean the fill cap, gasket, and indicator in accordance with manufacturer's manual. (29) Lubricate and install the fill cap and gasket in accordance with manufacturer's manual. (30) Secure the discharge hose in place and install the proper cartridge. (31) Replace the cartridge guard and install new tamper seals. (32) Record the maintenance on the extinguisher tag or label. (33) Return the extinguisher to the hanger, bracket, or cabinet.	PA 4140

C6. Portable Fire Extinguishers External Examination — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.3.2.1	Annually	Physical Condition. An annual external visual examination of all fire extinguishers shall be made to detect obvious physical damage, corrosion, or nozzle blockage to verify that the operating instructions are present, legible, and facing forward, and that the HMIS information is present and legible, and to determine if a 6-year interval examination or hydrostatic test is due.	PA 4141
NFPA 10 2018 7.3.2.2*	Annually	Seals or Tamper Indicators. At the time of the maintenance, the tamper seal of a rechargeable fire extinguisher shall be removed by operating the pull pin or locking device.	PA 4141
NFPA 10 2018 A.7.3.2.2		Where a safety seal or tamper indicator is missing, it can be evidence that the fire extinguisher has been used. If a tamper seal is found to be missing from a nonrechargeable extinguisher, it should be removed from service.	
NFPA 10 2018 7.3.2.2.1		After the applicable maintenance procedures are completed, a new listed tamper seal shall be installed.	
NFPA 10 2018 7.3.2.2.2		Seals or tamper indicators on non-rechargeable-type extinguishers shall not be removed.	
NFPA 10 2018 7.3.2.3*	Annually	Boots, Foot Rings, and Attachments. All removable extinguisher boots, foot rings, and attachments shall be removed to accommodate thorough annual cylinder examinations.	PA 4141
NFPA 10 2018 A.7.3.2.3		Removable extinguisher boots and foot rings are those that are not put on by the extinguisher manufacturer with glue or welded.	
NFPA 10 2018 7.3.2.4		When subjected to temperatures at or above their listed rating, stored-pressure fire extinguishers that require a 12-year hydrostatic test shall be emptied and subjected to the applicable maintenance and recharge procedures on an annual basis.	
NFPA 10 2018 7.3.2.5		Corrective Action. When an external examination of any fire extinguisher reveals a deficiency, immediate corrective action shall be taken.	

C7. Portable Fire Extinguishers Internal Examination — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.3.3.1*	As per Table 7.3.3.1	Maintenance Intervals. Fire extinguishers shall be internally examined at intervals not exceeding those specified in Table 7.3.3.1.	PA 4141

NFPA 10 2018
Table 7.3.3.1

Table 7.3.3.1 Maintenance Involving Internal Examination

Extinguisher Type	Internal Examination Interval (years)
Stored-pressure loaded stream and antifreeze	1
Pump tank water and pump tank, calcium chloride based	1
Dry chemical, cartridge- and cylinder-operated, with mild steel shells	1*
Dry powder, cartridge- and cylinder-operated, with mild steel shells	1*
Wetting agent	1
Stored-pressure water	5
AFFF (aqueous film-forming foam)	3†
FFFP (film-forming fluoroprotein foam)	3†
Stored-pressure dry chemical, with stainless steel shells	5
Carbon dioxide	5
Wet chemical	5
Dry chemical stored-pressure, with mild steel shells, brazed brass shells, and aluminum shells	6
Halogenated agents	6
Dry powder, stored-pressure, with mild steel shells	6

*Dry chemical and dry powder in cartridge- or cylinder-operated extinguishers are examined annually.
†The extinguishing agent in liquid charge-type AFFF and FFFP extinguishers is replaced every 3 years, and an internal examination (teardown) is normally conducted at that time.

NFPA 10 2018
A.7.3.3.1

Persons performing maintenance operations usually come from two major groups:

(1) Fire extinguisher service agencies
(2) Trained industrial safety or maintenance personnel

Fire extinguishers owned by individuals are often neglected because a periodic follow-up program is not planned. It is recommended that such owners become familiar with their fire extinguishers so they can detect telltale warnings during inspection that suggest the need for maintenance. When maintenance is indicated, it should be performed by trained persons having proper equipment. (See 7.1.2.2.)

The purpose of a well-planned and well-executed maintenance program for a fire extinguisher is to maximize the following probabilities:

(1) That the extinguisher will operate properly between the time intervals established for maintenance examinations in the environment to which it is exposed.
(2) That the extinguisher will not constitute a potential hazard to persons in its vicinity or to operators or rechargers of fire extinguishers Any replacement parts needed should be obtained from the manufacturer or a representative.

NFPA 10 2018 7.3.3.2	Annually	Loaded Stream Charge. Stored-pressure types of fire extinguishers containing a loaded stream agent shall be disassembled on an annual basis and subjected to complete maintenance.	PA 4141
NFPA 10 2018 7.3.3.2.1		The loaded stream charge shall be permitted to be recovered and re-used, provided it is subjected to agent analysis in accordance with the extinguisher manufacturer's instructions.	
NFPA 10 2018 7.3.3.2.2		When the internal maintenance procedures are performed during periodic recharging or hydrostatic testing, the 1-year requirement shall begin from that date.	
NFPA 10 2018 7.3.3.3*	Annually	Cartridge- or Cylinder-Operated Extinguishers. The extinguishing agent of cartridge- or cylinder-operated extinguishers shall be internally examined annually.	PA 4141
NFPA 10 2018 A.7.3.3.3		It is not necessary to empty cartridge- or cylinderoperated dry chemical fire extinguishers to check the condition of the extinguishing agent.	
NFPA 10 2018 7.3.3.4	Annually	Wetting Agent Extinguishers. Wetting agent extinguishers shall be disassembled on an annual basis and subjected to complete maintenance.	PA 4141
NFPA 10 2018 7.3.3.5	Annually	Pump Tank Extinguishers. Pump tank extinguishers shall be internally examined annually.	PA 4141
NFPA 10 2018 7.3.3.6		Annual internal examination shall not be required for nonrechargeable fire extinguishers, carbon dioxide fire extinguishers, or stored-pressure fire extinguishers, except for those types specified in 7.3.3.2.	
NFPA 10 2018 7.3.5		Corrective Action. When maintenance of any fire extinguisher reveals a deficiency, immediate corrective action shall be taken.	

C8. Annual Maintenance Record Keeping — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 A.7.3.4		In addition to the required tag or label, a permanent file record should be kept for each fire extinguisher. This file record should include the following information, as applicable: (1) Maintenance date and the name of the person and the agency performing the maintenance (2) Date of the last recharge and the name of the person and the agency performing the recharge (3) Hydrostatic retest date and the name of the person and the agency performing the hydrostatic test (4) Description of dents remaining after passing of the hydrostatic test (5) Date of the 6-year maintenance for stored-pressure dry chemical and halogenated agent types (See 7.3.6.) It is recognized that an electronic bar coding system is often acceptable to the authority having jurisdiction in lieu of a tag or label for maintenance record keeping. Under special circumstances, or when local requirements are in effect, additional information can be desirable or required.	
NFPA 10 2018 7.3.4.1		Each fire extinguisher shall have a tag or label securely attached that indicates that maintenance was performed.	
NFPA 10 2018 7.3.4.1.1		The tag or label, as a minimum, shall identify the following: (1) Month and year maintenance was performed (2) Person performing the work (3) Name of the agency performing the work	
NFPA 10 2018 7.3.4.2		Each extinguisher that has undergone maintenance that includes internal examination, except extinguishers identified in 7.3.3.3 and 7.3.3.5 shall have a verification-of-service collar located around the neck of the container.	

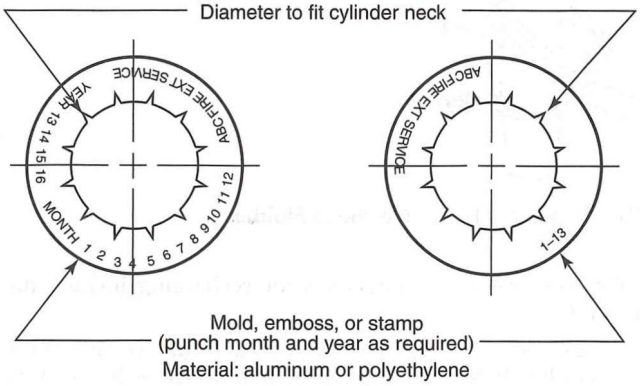
C9. Six-Year Internal Examination Stored-Pressure Fire Extinguishers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.3.6	6 Years	Every 6 years, stored-pressure fire extinguishers that require a 12-year hydrostatic test shall be emptied and subjected to the applicable internal and external examination procedures as detailed in the manufacturer's service manual and this standard.	PA 4141
NFPA 10 2018 7.3.6.1		When the applicable maintenance procedures are performed during periodic recharging or hydrostatic testing, the 6-year requirement shall begin from that date.	
NFPA 10 2018 7.3.6.2*		The removal of agent from halon agent fire extinguishers shall only be done using a listed halon closed recovery system.	
NFPA 10 2018 A.7.3.6.2		Halon removed from a fire extinguisher is kept in a closed recovery/recharge system until disposition can be made as to whether to recharge the halon back into a fire extinguisher or return unsatisfactory halon to a manufacturer for proper disposal. A listed Halon 1211 closed recovery/recharge system has the following: (1) Clear sight glass for monitoring the cleanliness of the Halon 1211 (2) A means of determining if the acceptable water content of the halon has been exceeded (3) A means of mechanically filtering the Halon 1211 and removing excess water. Such a recovery system also has a motor-driven pump system that permits the transfer of halon into a fire extinguisher or supply container without the need to vent the receiving container to reduce its pressure before halon transfer. Closed recovery/recharge systems also include the plumbing, valves, regulators, and safety relief devices to permit convenient, quick transfer of the Halon 1211.	
NFPA 10 2018 7.3.6.3		Nonrechargeable fire extinguishers shall not be required to have a 6-year internal examination and shall not be hydrostatically tested but shall be removed from service at a maximum interval of 12 years from the date of manufacture.	
NFPA 10 2018 7.3.6.3.1		Nonrechargeable halon agent fire extinguishers shall be disposed of in accordance with 7.2.3.3.	
NFPA 10 2018 7.3.6.4		Corrective Action. When an internal examination of any fire extinguisher reveals a deficiency, immediate corrective action shall be taken.	

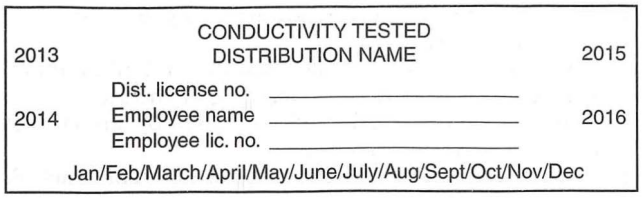
C10. Six-Year Internal Examination Label Stored-Pressure Fire Extinguishers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.3.6.5*		Fire extinguishers that pass the applicable 6-year requirement of 7.3.6 shall have the maintenance information recorded on a durable weatherproof label that is a minimum of 2 in. × 3 ½ in. (51 mm × 89 mm).	
NFPA 10 2018 A.7.3.6.5		Labels should be printed in black with a light blue background.	
NFPA 10 2018 7.3.6.5.1		The new label shall be affixed to the shell by a heatless process, and any previous 6-year internal examination labels shall be removed.	
NFPA 10 2018 7.3.6.5.2		These labels shall be of the self-destructive type when their removal from a fire extinguisher is attempted.	
NFPA 10 2018 7.3.6.5.3	6 years	The 6-year internal examination label shall, as a minimum, identify the following: (1) Month and year the 6-year internal examination was performed (2) Person performing the work (3) Name of the agency performing the work	PA 4141

C11. Verification-of-Service Collar — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.11*		Maintenance and Recharge Service Collar. Each extinguisher that has undergone maintenance that included internal examination or that has been recharged requiring the removal of the valve assembly shall have a verification-of-service collar located around the neck of the container.	
NFPA 10 2018 A.7.11		A verification-of-service collar is installed to show that an extinguisher has been depressurized, the valve has been removed, and a complete maintenance has been performed. The verification-of-service collar design also requires that the valve be removed before the collar can be attached to the extinguisher. The collar provides the authorities having jurisdiction with a convenient visual proof that the extinguisher has been disassembled and that maintenance most likely has been performed. All extinguishers are to have the valve removed for hydrostatic testing and are to be subsequently recharged before they are returned to service. To be valid, the date on the verification-of-service collar should always be the same as or more recent than the date on the hydrostatic test label. Figure A.7.11 provides a guide to the design of a verification-of-service collar.	
NFPA 10 2018 Figure A.7.11		 **FIGURE A.7.11 Design of a Verification-of-Service Collar.**	
NFPA 10 2018 7.11.1		The collar shall be a single circular piece of uninterrupted material forming a hole of a size that does not permit the collar assembly to move over the neck of the container unless the valve is completely removed.	
NFPA 10 2018 7.11.2		The collar shall not interfere with the operation of the fire extinguisher.	
NFPA 10 2018 7.11.3		The verification-of-service collar shall, as a minimum, identify the following: (1) Month and year the recharging or internal examination was performed (2) Name of the agency performing the work	
NFPA 10 2018 7.11.4.1		New extinguishers requiring an initial charge in the field (such as pressurized water, AFFF, FFFP, or wet chemical extinguishers) shall not be required to have a verification-of-service collar installed.	
NFPA 10 2018 7.11.4.2		Liquefied gas, halogenated agent, and carbon dioxide extinguishers that have been recharged without valve removal shall not be required to have a verification-of-service collar installed following recharge.	
NFPA 10 2018 7.11.4.3		Cartridge- and cylinder-operated extinguishers shall not be required to have a verification-of-service collar installed.	

C12. Carbon Dioxide Hose Assembly Conductivity Test — Testing / Maintenance

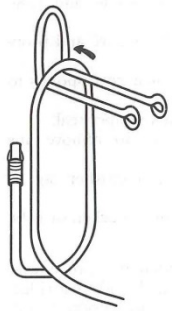
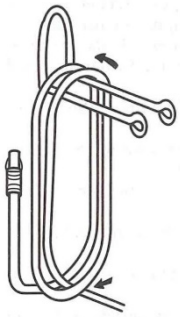
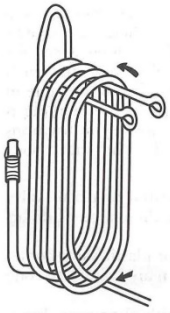
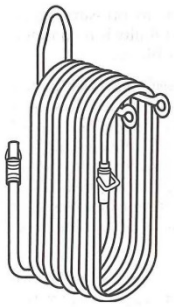
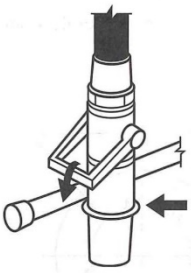
Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.4*	Annually	Carbon Dioxide Hose Assembly Conductivity Test. A conductivity test shall be conducted annually on all carbon dioxide hose assemblies.	PA 4142
NFPA 10 2018 A.7.4		Carbon dioxide hose assemblies have a continuous metal braid that connects to both couplings to minimize the static shock hazard. The reason for the conductivity test is to determine that the hose is conductive from the inlet coupling to the outlet orifice. A basic conductivity tester consists of a flashlight having an open circuit and a set of two wires with a conductor (clamps or probe) at each end. Figure A.7.4 provides a guide to the design of a conductivity test label.	
NFPA 10 2018 Figure A.7.4		 FIGURE A.7.4 Conductivity Test Label.	
NFPA 10 2018 7.4.1		Carbon dioxide hose assemblies that fail the conductivity test shall be replaced.	

C13. Record Keeping for Conductivity Testing of Carbon Dioxide Hose Assemblies — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.4.2.1		Carbon dioxide hose assemblies that pass a conductivity test shall have the test information recorded on a durable weatherproof label that is a minimum of 1⁄2 in. × 3 in. (13 mm × 76 mm).	
NFPA 10 2018 7.4.2.2		The label shall be affixed to the hose by means of a heatless process.	
NFPA 10 2018 7.4.2.3		The label shall include the following information: (1) Month and year the test was performed, indicated by perforation, such as is done by a hand punch (2) Name or initials of person performing the test and the name of the agency performing the test	

C14. Maintenance of Wheeled Extinguisher Hoses and Regulators — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.7.1	Annually	Wheeled Unit Hoses. Discharge hoses on wheeled-type fire extinguishers shall be completely uncoiled and examined for damage annually.	PA 4142
NFPA 10 2018 7.7.1.1*		Discharge hoses on wheeled extinguishers shall be coiled in a manner to prevent kinks and to allow rapid deployment in accordance with the manufacturer's instructions.	
NFPA 10 2018 A.7.7.1.1		The following procedure permits rapid removal of the hose by one person without kinking of the hose and without obstruction of flow of the extinguishing agent: (1) Form a standard loop over the hose supports [see Figure A.7.7.1.1(a)]. (2) Follow with a reverse loop over the hose supports so that the hose passes behind the loop [see Figure A.7.7.1.1(b)]. (3) Repeat steps (1) and (2), alternating standard loops and reverse loops, until all hose is	

		coiled on the support [see Figure A.7.7.1.1(c)]. (4) Adjust the coil so that the nozzle is in the downward position [see Figure A.7.7.1.1(d)]. Hose coiled in this manner pulls off free of twists. (5) Place the nozzle in the holder with the handle forward in the closed position [see Figure A.7.7.1.1(e)].	
NFPA 10 2018 Figures A.7.7.1.1 (a) & (b)		 FIGURE A.7.7.1.1(a) Counterclockwise Loop.  FIGURE A.7.7.1.1(b) Reverse Loop.	
NFPA 10 2018 Figure A.7.7.1.1 (c)		 FIGURE A.7.7.1.1(c) Procedures in Figure A.7.6.2(a) and Figure A.7.6.2(b) Continued.	
NFPA 10 2018 Figures A.7.7.1.1 (d) & (e)		 FIGURE A.7.7.1.1(d) Nozzle in Downward Position.  FIGURE A.7.7.1.1(e) Nozzle in Holder.	
NFPA 10 2018 7.7.2	Annually	Pressure Regulators. Pressure regulators provided with wheeled-type fire extinguishers shall be tested annually for outlet static pressure and flow rate in accordance with the manufacturer's instructions.	PA 4142
NFPA 10 2018 7.7.3		Corrective Action. When maintenance of any fire extinguisher hose or pressure regulator reveals a deficiency, immediate corrective action shall be taken.	

D. Extinguisher Recharging

D1. Extinguisher Recharging and Extinguishing Agents – General Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 A.7.8.1		General safety guidelines for recharging include the following: (1) Make sure all pressure is vented from the fire extinguisher before attempting to remove the valve body or to fill the closure. (Warning: Do not depend on pressure indicating devices to tell if the container is under pressure because the devices could malfunction.) (2) Use proper recharge materials when refilling a fire extinguisher. Mixing of some extinguishing agents can cause a chemical reaction, resulting in a dangerous pressure buildup in the container. (3) The weight of agent as specified on the nameplate is critical. Overfilling could render the fire extinguisher dangerous or ineffective. (4) Clean and properly lubricate all sealing components to prevent leakage after recharge. (5) Check the pressure-indicating device to ascertain that it is reading properly. (6) Most manufacturers recommend the use of dry nitrogen as an expellant gas for stored-pressure fire extinguishers. Limiting the charging pressure regulator setting to 25 psi (172 kPa) above service pressure, as specified in 7.8.4.5.2, prevents gauge damage and loss of calibration. (Warning: Never connect the fire extinguisher to be charged directly to the high-pressure source. Connecting directly to the high-pressure source could cause the container to rupture, resulting in injury. Never leave a fire extinguisher connected to the regulator of a high pressure source for an extended period of time. A defective regulator could cause the container to rupture due to excess pressure.) (7) Use the manufacturer's recommended charging adapter to prevent damage to a valve and its components. (8) When recharging separate expellant source fire extinguishers, make sure the filled enclosure is in place and tightened down. Replace all safety devices prior to installing replacement cartridges. (9) Use only gas cartridges recommended by the manufacturer. Cartridge features such as pressure relief, puncturing capabilities, fill density, and thread compatibility are designed and approved to specific functional requirements. (10) Use proper safety seals; other types, such as meter seals, could fail to break at the prescribed requirements. (11) Regulators utilized on wheeled fire extinguishers are factory pinned at the operating pressure and should not be field adjusted.	
NFPA 10 2018 7.8.1.1		All rechargeable-type fire extinguishers shall be recharged after any use or when the need is indicated by an inspection or servicing.	
NFPA 10 2018 7.8.1.2*		When recharging is performed, the manufacturer's service manual shall be followed. (For recharge agents, see 7.8.3.)	
NFPA 10 2018 A.7.8.1.2		Some manufacturers require that their fire extinguishers be returned to the factory for recharging.	
NFPA 10 2018 7.8.1.3*		The amount of recharge agent shall be verified by weighing.	
NFPA 10 2018 A.7.8.1.3		To determine the gross weight, the entire fire extinguisher should be weighed empty. The weight of the specified recharge agent should be added to that amount.	
NFPA 10 2018 7.8.1.3.1		For those fire extinguishers that do not have the gross weight marked on the nameplate or valve, a permanent label that indicates the gross weight shall be affixed to the cylinder.	
NFPA 10 2018 7.8.1.3.2		The added label containing the gross weight shall be a durable material of a pressure-sensitive, self-destruct type. (For stored-pressure water-type extinguishers, see 7.8.3.10.)	
NFPA 10 2018 7.8.1.3.3		Pump tank water and pump tank calcium chloride-based antifreeze types shall not be required to have weight marked.	
NFPA 10 2018 7.8.1.3.4*		After recharging, a leak test shall be performed on stored-pressure and self-expelling types of fire extinguishers.	
NFPA 10 2018 A.7.8.1.3.4		The leak test required for stored-pressure and self-expelling types should be sufficiently sensitive to ensure that the fire extinguisher remains operable for at least 1 year. Any tamper indicators or seals need to be replaced after recharging.	

NFPA 10 2018 7.8.1.3.5		In no case shall an extinguisher be recharged without hydrostatic testing if it is beyond its specified hydrostatic test date.	

D2. Extinguisher Recharging Frequency for Certain Types of Extinguishers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.8.2.1	Annually	Pump Tank. Every 12 months, pump tank water and pump tank calcium chloride–based antifreeze types of fire extinguishers shall be recharged with new chemicals or water as applicable.	PA 4143
NFPA 10 2018 7.8.2.2	Annually	Wetting Agent. The agent in stored-pressure wetting agent fire extinguishers shall be replaced annually.	PA 4143
NFPA 10 2018 7.8.2.2.1		Only the agent specified on the nameplate shall be used for recharging.	
NFPA 10 2018 7.8.2.2.2		The use of water or any other additives shall be prohibited.	
NFPA 10 2018 7.8.2.3.1	3 Years	AFFF and FFFP The premixed agent in liquid charge–type AFFF and FFFP fire extinguishers shall be replaced at least once every 3 years.	PA 4143
NFPA 10 2018 7.8.2.3.2		Only the foam agent specified on the extinguisher nameplate shall be used for recharge.	
NFPA 10 2018 7.8.2.3.3		The agent in nonpressurized AFFF and FFFP fire extinguishers that is subjected to agent analysis in accordance with manufacturer's instructions shall not be required to comply with 7.8.2.3.1.	
NFPA 10 2018 A.7.8.3		Recharge Agents. On properties where fire extinguishers are maintained by the occupant, a supply of recharging agents should be kept on hand. These agents should meet the requirements of 7.8.3. The intent of this provision is to maintain the efficiency of each fire extinguisher as produced by the manufacturer and as labeled by one or more of the fire testing laboratories. For example, the extinguishing agent and the additives used in the various types of dry chemical fire extinguishers vary in chemical composition and in particle size and, thus, in flow characteristics. Each fire extinguisher is designed to secure maximum efficiency with the particular formulation used. Changing the agent from that specified on the fire extinguisher nameplate could affect flow rates, nozzle discharge characteristics, and the quantity of available agent (as influenced by density) and would void the label of the testing laboratory. Certain recharging materials deteriorate with age, exposure to excessive temperature, and exposure to moisture. Storage of recharge agents for long periods of time should be avoided. Dry powder used for combustible metal fires (Class D) should not become damp, because the powder will not be free flowing. In addition, when dry powder contains sufficient moisture, a hazardous reaction could result when applied to a metal fire.	
NFPA 10 2018 7.8.3.1		Only those agents specified on the nameplate or agents proven to have equal chemical composition, physical characteristics, and fire-extinguishing capabilities shall be used.	
NFPA 10 2018 7.8.3.1.1		Agents listed specifically for use with that fire extinguisher shall be considered to meet these requirements.	
NFPA 10 2018 7.8.3.2*		Mixing of Dry Chemicals. Multipurpose dry chemicals shall not be mixed with alkaline-based dry chemicals.	
NFPA 10 2018 7.8.3.3.1		Topping Off. The remaining dry chemical in a discharged fire extinguisher shall be permitted to be re-used, provided that it is thoroughly checked for the proper type, contamination, and condition.	
NFPA 10 2018 7.8.3.3.2		Dry chemical found to be of the wrong type or contaminated shall not be re-used.	
NFPA 10 2018 7.8.3.4.1		Dry Chemical Agent Re-Use. The dry chemical agent shall be permitted to be reused, provided a closed recovery system is used and the agent is stored in a sealed container to prevent contamination.	
NFPA 10 2018 7.8.3.4.2		Prior to re-use, the dry chemical shall be thoroughly checked for the proper type, contamination, and condition.	

NFPA 10 2018 7.8.3.4.3		Where doubt exists with respect to the type, contamination, or condition of the dry chemical, the dry chemical shall be discarded.	
NFPA 10 2018 7.8.3.5.1		Dry Powder Pails or drums containing dry powder agents for scoop or shovel application for use on metal fires shall be kept full and sealed with the lid provided with the container.	
NFPA 10 2018 7.8.3.5.2		The dry powder shall be replaced if found damp. (See A.7.8.3.)	
NFPA 10 2018 7.8.3.6*		Removal of Moisture. For all non-water types of fire extinguishers, any moisture shall be removed before recharging.	
NFPA 10 2018 A.7.8.3.6		Moisture within a non-water-type fire extinguisher creates a serious corrosion hazard to the fire extinguisher shell and also indicates that the extinguisher is probably inoperative. Moisture could possibly enter at under the following conditions: (1) After a hydrostatic test (2) When recharging is being performed (3) When the valve has been removed from the cylinder (4) Where compressed air and a moisture trap are used for pressurizing non-water types It is extremely important to remove any water or moisture from any fire extinguisher before recharging. Excess moisture in a dry chemical fire extinguisher causes the agent to cake and lump and become unusable. It also causes corrosion to the fire extinguisher shell and valve. In carbon dioxide and halogenated fire extinguishers, excess moisture combined with the extinguishing agent causes extremely corrosive acids to form. These acids can corrode the fire extinguisher shell and valve.	
NFPA 10 2018 7.8.3.7*		Halogenated Agent. Halogenated agent fire extinguishers shall be charged with only the type and weight of agent specified on the nameplate.	
NFPA 10 2018 A.7.8.3.7		If the fire extinguisher valve is removed for servicing, it is recommended that the fire extinguisher be purged with nitrogen or argon (as appropriate) or that a vacuum be drawn on the fire extinguisher cylinder prior to recharging.	
NFPA 10 2018 7.8.3.8.1		Halogenated Agent Re-Use. The removal of Halon 1211 from fire extinguishers shall be done using only a listed halon closed recovery system.	
NFPA 10 2018 7.8.3.8.2		The removal of agent from other halogenated agent fire extinguishers shall be done using only a closed recovery system.	
NFPA 10 2018 7.8.3.8.3		The fire extinguisher shall be examined internally for contamination or corrosion or both.	
NFPA 10 2018 7.8.3.8.4		The halogenated agent retained in the system recovery cylinder shall be re-used only if no evidence of internal contamination is observed in the fire extinguisher cylinder.	
NFPA 10 2018 7.8.3.8.5		Halogenated agent removed from fire extinguishers that exhibits evidence of internal contamination or corrosion shall be processed in accordance with the fire extinguisher manufacturer's instructions.	
NFPA 10 2018 A.7.8.3.9		Carbon Dioxide. The preferred source of carbon dioxide for recharging fire extinguishers is from a low-pressure [300 psi at 0°F (2068 kPa at −17.8°C)] supply, supplied either directly or via dry cylinders used as an intermediary means. Dry ice converters should not be used to recharge carbon dioxide portable fire extinguishers.	
NFPA 10 2018 7.8.3.9.1		The vapor phase of carbon dioxide shall be not less than 99.5 percent carbon dioxide.	
NFPA 10 2018 7.8.3.9.2		The water content shall be not more than 60 parts per million (ppm) by weight at −52°F (−47°C) dew point.	
NFPA 10 2018 7.8.3.9.3		Oil content shall not exceed 10 ppm by weight.	
NFPA 10 2018 7.8.3.10*		Water Types. The amount of liquid agent shall be determined by using one of the following: (1) Exact measurement by weight (2) Exact measurement by volume (3) Anti-overfill tube, if provided (4) Fill mark on fire extinguisher shell, if provided	
NFPA 10 2018 7.8.3.10.1		Only the agent specified on the extinguisher nameplate shall be used for recharge.	

NFPA 10 2018 7.8.3.10.2		Only additives identified on the original nameplate shall be permitted to be added to water-type extinguishers.	
NFPA 10 2018 7.8.3.11		Wet Chemical and Water Mist Agent Re-Use.	
NFPA 10 2018 7.8.3.11.1		Wet chemical and water mist agents shall not be reused.	
NFPA 10 2018 7.8.3.11.2		If a wet chemical or water mist extinguisher is partially discharged, all remaining wet chemical or water mist shall be discarded.	
NFPA 10 2018 7.8.3.11.3		Wet chemical or water mist agent shall be discarded and replaced at the hydrostatic test interval.	
NFPA 10 2018 7.8.3.11.3.1		Only the agent specified on the extinguisher nameplate shall be used for recharge.	

D3. Recharging Expellant Gas for Stored-Pressure Fire Extinguishers — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.8.4.5		A rechargeable stored-pressure-type fire extinguisher shall be pressurized only to the charging pressure specified on the fire extinguisher nameplate.	
NFPA 10 2018 7.8.4.5.1		The manufacturer's pressurizing adapter shall be connected to the valve assembly before the fire extinguisher is pressurized.	
NFPA 10 2018 v7.8.4.5.2		A regulated source of pressure, set no higher than 25 psi (172 kPa) above the operating (service) pressure, shall be used to pressurize fire extinguishers.	
NFPA 10 2018 7.8.4.5.3	Annually	The gauge used to set the regulated source of pressure shall be calibrated at least annually.	PA 4137
NFPA 10 2018 7.8.4.6*		An unregulated source of pressure, such as a nitrogen cylinder without a pressure regulator, shall not be used.	
NFPA 10 2018 A.7.8.4.6		The reason an unregulated source of pressure is not to be used is because the fire extinguisher has the potential to be overpressurized and possibly rupture.	
NFPA 10 2018 7.8.4.7*		A fire extinguisher shall not be left connected to the regulator of a high-pressure source for an extended period of time.	
NFPA 10 2018 A.7.8.4.7		A defective regulator could cause the container to rupture due to excess pressure.	
NFPA 10 2018 7.8.4.3.3		Compressed air without moisture removal devices shall be permitted for pressurizing water extinguishers and foam hand extinguishers only.	
NFPA 10 2018 7.8.4.4*		Class D wet chemical, water mist, and halogenated agent fire extinguishers shall be repressurized only with the type of expellant gas referred to on the fire extinguisher label.	
NFPA 10 2018 A.7.8.4.4		Some Class D fire extinguishers are required to be pressurized with argon.	

D4. Recharge Record Keeping — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 7.8.4.8.1		Each fire extinguisher shall have a tag or label attached that indicates the month and year recharging was performed, identifies the person performing the service, and identifies the name of the agency performing the work.	
NFPA 10 2018 7.8.4.8.2		Each extinguisher that has been recharged shall have a verification-of-service collar located around the neck of the container, except as identified in 7.11.4.	

E. Hydrostatic Testing

E1. Hydrostatic Testing – General — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 8.1.2		Cylinders and cartridges bearing U.S. Department of Transportation (DOT) or Transport Canada (TC) markings shall be retested in accordance with the applicable DOT or TC regulations.	

NFPA 10 2018 8.1.2.1		Hydrostatic testing shall be performed by persons who are trained in pressure testing procedures and safeguards complying with 7.1.2 and who have testing equipment, facilities, and an appropriate manufacturer's service manual(s) available.	
NFPA 10 2018 8.1.2.1.1		Personnel performing hydrostatic testing shall be certified by an organization with a certification program acceptable to the authority having jurisdiction.	
NFPA 10 2018 8.1.2.1.2		Hydrostatic testing facilities with a DOT certification [requalification identification number (RIN)] or a TC certification shall be permitted to perform the task of hydrostatic testing without having additional certification as a fire extinguisher technician as outlined in 7.1.2.	
NFPA 10 2018 8.1.2.1.3*		Where hydrostatic testing is subcontracted to a facility described in 8.1.2.1.1, an extinguisher technician complying with 7.1.2 shall perform assembly and disassembly of valves and cylinders, replacement of any parts or components, and all other extinguisher service work.	
NFPA 10 2018 A.8.1.2.1.3		It is acceptable for hydrostatic testing to be subcontracted to persons or facilities that are qualified to perform such work and that have the required equipment and personnel trained in hydrostatic testing procedures and safeguards. The task of hydrostatic testing is only part of the work involved. The extinguisher must be depressurized, emptied, and disassembled and have the valve disassembled, cleaned, and refurbished as necessary. Materials such as extinguisher manufacturers' service manuals, service bulletins, parts, and lubricants should be available. After the hydrostatic testing, the extinguisher must be refilled, reassembled, pressurized, and leak tested. These are all tasks involved in "other" extinguisher servicing and must be accomplished by someone who is qualified as an extinguisher service technician.	
NFPA 10 2018 8.1.3		A hydrostatic test shall always include both an internal and an external visual examination of the cylinder.	
NFPA 10 2018 8.1.4		Hydrostatic testing shall be conducted using water or another compatible noncompressible fluid as the test medium.	
NFPA 10 2018 8.1.4.1		Air or other gases shall not be used as the sole medium for pressure testing.	
NFPA 10 2018 8.1.4.2		All air shall be vented prior to hydrostatic testing, to prevent violent and dangerous failure of the cylinder.	
NFPA 10 2018 8.1.5*		Fire extinguishers having aluminum cylinders or shells suspected of being exposed to temperatures in excess of 350°F (177°C) shall be removed from service and subjected to a hydrostatic test.	
NFPA 10 2018 A.8.1.5		The structural integrity of aluminum shells and cylinders is reduced when they are exposed to temperatures in excess of 350°F (177°C). These temperatures can occur under fire exposure without any visual evidence or during repainting operations in which oven drying is utilized.	

E2. Hydrostatic Testing – Frequency Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 8.3.1	As Required	General. At intervals not exceeding those specified in Table 8.3.1, fire extinguishers shall be hydrostatically retested.	PA 4143

NFPA 10 2018 Table 8.3.1		**Table 8.3.1 Hydrostatic Test Intervals for Extinguishers** Extinguisher Type — Test Interval (years) Stored-pressure water, water mist, loaded stream, and/or antifreeze — 5 Wetting agent — 5 AFFF (aqueous film-forming foam) — 5 FFFP (film-forming fluoroprotein foam) — 5 Dry chemical with stainless steel shells — 5 Carbon dioxide — 5 Wet chemical — 5 Dry chemical, stored-pressure, with mild steel shells, brazed brass shells, or aluminum shells — 12 Dry chemical, cartridge- or cylinder-operated, with mild steel shells — 12 Halogenated agents — 12 Dry powder, stored-pressure, cartridge- or cylinder-operated, with mild steel shells — 12	
NFPA 10 2018 8.3.1.1		The hydrostatic retest shall be conducted within the calendar year of the specified test interval.	

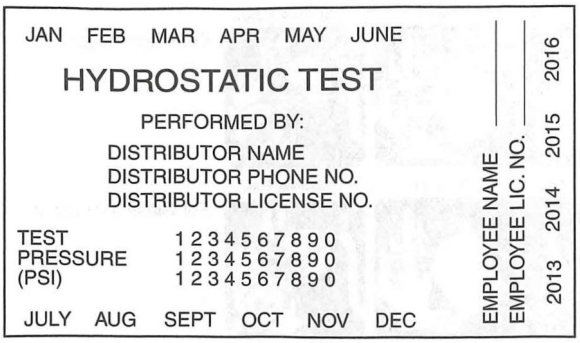
E3. Hydrostatic Testing Expellant Cylinders and Cartridges — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 8.3.2.1	5 Years	Nitrogen cylinders, argon cylinders, carbon dioxide cylinders, or cartridges used for inert gas storage that are used as expellants for wheeled fire extinguishers and carbon dioxide extinguishers shall be hydrostatically tested every 5 years.	PA 4143
NFPA 10 2018 8.3.2.1.1	10 Years	Cylinders (except those charged with carbon dioxide) complying with 49 CFR 180.209(b) shall be permitted to be hydrostatically 10 years in lieu of the requirement in 8.3.2.1.	PA 4143
NFPA 10 2018 8.3.2.2		Nitrogen cartridges, argon cartridges, and carbon dioxide cartridges used as an expellant for hand portable fire extinguishers that have DOT or TC markings shall be hydrostatically tested or replaced according to the requirements of DOT or TC.	
NFPA 10 2018 8.3.2.2.1		DOT 3E cartridges or TC 3EM cartridges shall be exempt from periodic hydrostatic retest.	

E4. Hydrostatic Testing – Hose Assemblies — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 8.3.3.1		A hydrostatic test shall be performed on fire extinguisher hose assemblies equipped with a shutoff nozzle at the end of the hose.	PA 4143
NFPA 10 2018 8.3.3.2		High-pressure and low-pressure accessory hose (other than agent discharge hose) used on wheeled extinguishers shall be hydrostatically tested.	PA 4143
NFPA 10 2018 8.3.3.3		The test interval for 8.3.3.1 and 8.3.3.2 shall be the same as that specified for the fire extinguisher or fire extinguisher agent cylinder on which the hose is installed.	
NFPA 10 2018 8.7.4		Hose assemblies that pass a hydrostatic test shall not require recording, labeling, or marking.	

E5. Recording of Hydrostatic Tests — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 10 2018 8.7.1*		Records. The record of a hydrostatic test shall be maintained by the organization that performed the test until either the expiration of the test period or until the cylinder is again tested, whichever occurs first.	
NFPA 10 2018 A.8.7.1		A record of testing should include, as a minimum, the date of the test, cylinder serial number or extinguisher serial number, model number, cylinder size, test pressure, visual inspection result, cylinder disposition, and initials of the person performing the test. Refer to CGA C-1, Methods for Pressure Testing Compressed Gas Cylinders, for a sample form for recording test results.	
NFPA 10 2018 8.7.2*		Low-Pressure Cylinders	
NFPA 10 2018 A.8.7.2		Figure A.8.7.2 provides a guide to the design of a hydrostatic test label. All print should be black on a silver background.	
NFPA 10 2018 Figure A.8.7.2		 **FIGURE A.8.7.2 Design of a Hydrostatic Test Label.**	
NFPA 10 2018 8.7.2.1		Fire extinguisher cylinders of the low-pressure non-DOT type that pass a hydrostatic test shall have the following information recorded on a label: (1) Month and year the test was performed, indicated by a perforation, such as is done by a hand punch (2) Test pressure used (3) Name or initials of the person performing the test and name of the agency performing the test.	
NFPA 10 2018 8.7.2.2		The label shall meet the following criteria: (1) Sized at a minimum of 2 in. × 3½ in. (51 mm × 89 mm) (2) Affixed by a heatless process (3) Self-destructs when removed from a fire extinguisher cylinder shell (4) Made of a durable, weatherproof material with a pressure-sensitive adhesive	
NFPA 10 2018 8.7.2.3		In addition to the information in 8.7.2.1, DOT specification cylinders shall be labeled in accordance with 49 CFR 180.213(c)(1).	
NFPA 10 2018 8.7.3.1		Cylinders or cartridges that pass the hydrostatic test shall be stamped with the retester's identification number and the month and year of the retest per DOT/TC requirements.	
NFPA 10 2018 8.7.3.2		Stamping shall be placed only on the shoulder, top, head, neck, or foot ring (where provided) of the cylinder or in accordance with 49 CFR 180.213(c)(1).	

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PORTABLE FIRE EXTINGUISHERS
GENERAL INFORMATION

PA 4135 / 12-20

Building ID: **Total Number of Portable Fire Extinguishers:**

1. Portable Extinguisher Identification - Provide unique identifier for each Portable Fire Extinguisher i.e., Serial Number, U.E.I., etc.
2. Provide location of Portable Fire Extinguisher
3. Identify Type of Portable Fire Extinguisher i.e., Purple K, Dry Chemical, Water, AFFF/FFFP, Halon, etc. and Rating i.e., 4-A:80-B:C, etc.
4. Date of the last Hydrostatic Test as identified on the Portable Fire Extinguisher
5. Provide any other information in Notes.

Extinguisher ID	Location	Type of Extinguisher	Hydrostatic Test Date	Notes

THE PORT AUTHORITY OF NY & NJ

PORTABLE FIRE EXTINGUISHERS
MONTHLY INSPECTION

PA 4136 / 12-20

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document monthly inspections of portable fire extinguishers.
- Record the date of the inspection. Record "S" to indicate a satisfactory or "U" if unsatisfactory.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Portable Fire Extinguishers – Inspection – Monthly – {Reference C16B1} –** Conduct a monthly inspection to verify that the portable fire extinguishers are readily available and in good working order. Periodic inspection or electronic monitoring of fire extinguishers shall include a check of at least the following items:

Location in designated place	Visibility of the extinguisher or means of indicating the extinguisher location.	Pressure gauge reading or indicator in the operable range or position
Access to the extinguisher	Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers.	Indicator for nonrechargeable extinguishers using push-to-test pressure indicators
Fullness determined by weighing or hefting		

Extinguisher ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes

PORTABLE EXTINGUISHERS – MAINTENANCE

PA 4137 / 12-20

RECHARGEABLE, STORED PRESSURE, DRY CHEMICAL, HALOGENATED

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document maintenance of portable fire extinguishers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Portable Extinguishers – Maintenance – Annually – {Reference C16C1, C16C2} – Fire extinguishers shall be subjected to maintenance at intervals of not more than 1 year, at the time of hydrostatic test, or when specifically indicated by an inspection discrepancy or electronic notification. Maintenance of fire extinguishers should not be confused with inspection, which is a quick check of the extinguishers that is performed at least every 30 days. The following list is a sample of maintenance procedures that should be followed to determine deficiencies appropriate for rechargeable, stored-pressure, dry chemical, and halogenated agent hand portable fire extinguishers:

1. Visually examine the extinguisher for damage by removing the extinguisher from the hanger, bracket, or cabinet, and visually examine the extinguisher for damage, including pressure gauge, cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers.	2. Verify that the hanger, bracket, or cabinet is the proper one for the extinguisher.	3. Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted.
4. Verify that the nameplate operating instructions are legible and facing outward.	5. Confirm that the extinguisher model is not subject to recall and is not obsolete.	6. Verify the extinguisher records to determine internal examination and hydrostatic test intervals. Thoroughly examine the cylinder for dents, damage, repairs, or corrosion.
7. Verify the pull pin functions properly and examine for damage or corrosion by removing the pull pin.	8. Verify that the handle and levers are undamaged and operable.	9. Verify that the valve stem is correctly extended and not corroded or damaged.
10. Verify that the pressure gauge or indicator is in the operable range.	11. Verify that the gauge operating pressure corresponds with the nameplate instructions.	12. Verify that the gauge face corresponds with the proper agent type.
13. Verify that the gauge threads are compatible with the valve body material.	14. Verify that the nozzle or hose assembly, or both, is unobstructed, by removing and examining the nozzle.	15. Confirm that the nozzle and hose assembly are correct for the model of extinguisher.
16. Verify that the hose and couplings are not cut, cracked, damaged, or deformed.	17. Examine internal valve port surfaces and threads for signs of leakage or corrosion by removing the nozzle or hose assembly and reinstalling the nozzle and hose assembly securely after examination.	18. Verify that the hose retention band is secure and properly adjusted.
19. Weigh the extinguisher and verify that it corresponds to the weight listed on the nameplate.	20. Reinstall the ring pin and install a new tamper seal.	21. Clean exposed extinguisher surfaces to remove any foreign material.
22. Record the maintenance on the extinguisher tag or label.	23. Return the extinguisher to the hanger, bracket, or cabinet.	

2. Stored-Pressure Fire Extinguishers – Recharging Source Gauge – Annually – {Reference C16D3} – The gauge used to set the regulated source of pressure shall be calibrated at least annually.

S = Satisfactory **U = Unsatisfactory**

Extinguisher ID	Date	Inspector	Task/Result	Notes

PORTABLE EXTINGUISHERS – MAINTENANCE
CARBON DIOXIDE EXTINGUISHERS

PA 4138 / 12-20

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document maintenance of portable fire extinguishers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the inspection including documentation of deficiencies identified, date corrected, and who performed the work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Portable Extinguishers – Maintenance – Annually – {Reference C16C1, C16C3} – Fire extinguishers shall be subjected to maintenance at intervals of not more than 1 year, at the time of hydrostatic test, or when specifically indicated by an inspection discrepancy or electronic notification. Maintenance of fire extinguishers should not be confused with inspection, which is a quick check of the extinguishers that is performed at least every 30 days. The following list is a sample of maintenance procedures that should be followed to determine deficiencies appropriate for carbon dioxide hand portable fire extinguishers:

1. Visually examine the extinguisher for damage by removing the extinguisher from the hanger or cabinet, and visually examine the extinguisher for damage, including cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers.	2. Verify that the bracket or cabinet is the proper one for the extinguisher.	3. Verify that the bracket or cabinet is secure, undamaged, and properly mounted.
4. Verify that the nameplate operating instructions are legible and facing outward.	5. Confirm that the extinguisher model is not subject to recall and is not obsolete.	6. Verify the extinguisher records to determine hydrostatic test intervals.
7. Verify the pull pin functions properly and examine for damage or corrosion by removing the pull pin.	8. Examine the handle and levers to ensure that they are undamaged and operable.	9. Verify that the valve stem is correctly extended and not corroded or damaged.
10. Verify that the nozzle or hose assembly, or both, is unobstructed, by removing and examining the nozzle.	11. Confirm that the nozzle and hose assembly are correct for the model of extinguisher.	12. Verify that the hose and couplings are not cut, cracked, damaged, or deformed.
13. Examine the discharge port for signs of leakage or corrosion by removing the nozzle or hose assembly and reinstalling the nozzle and hose assembly securely after examination.	14. Conduct a conductivity test on the hose assembly.	15. Affix the conductivity test label to hose assemblies that pass the conductivity test and replace hoses that fail the conductivity test.
16. Verify that the safety assembly is not damaged or blocked.	17. Verify that the hose retention band is secure and properly adjusted.	18. Weigh the extinguisher to verify that it corresponds to the weight listed on the nameplate.
19. Reinstall the ring pin and install a new tamper seal.	20. Clean exposed extinguisher surfaces to remove any foreign material.	21. Record the maintenance on the extinguisher tag or label.
22. Return the extinguisher to the hanger, bracket, or cabinet.		

S = Satisfactory **U = Unsatisfactory**

Extinguisher ID	Date	Inspector	Result	Notes

PORTABLE EXTINGUISHERS – MAINTENANCE
PRESSURIZED WATER TYPE EXTINGUISHERS

PA 4139 / 12-20

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document maintenance of portable fire extinguishers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the inspection including documentation of deficiencies identified, date corrected, and who performed the work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Portable Extinguishers – Maintenance – Annually – {Reference C16C1, C16C4} – Fire extinguishers shall be subjected to maintenance at intervals of not more than 1 year, at the time of hydrostatic test, or when specifically indicated by an inspection discrepancy or electronic notification. Maintenance of fire extinguishers should not be confused with inspection, which is a quick check of the extinguishers that is performed at least every 30 days. The following list is a sample of maintenance procedures that should be followed to determine deficiencies associated with pressurized water-type hand portable fire extinguishers:

1. Visually examine the extinguisher for damage by removing the extinguisher from the hanger, bracket, or cabinet, and visually examine the extinguisher for damage, including pressure gauge, cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers	2. Verify that the hanger, bracket, or cabinet is the proper one for the extinguisher.	3. Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted.
4. Verify that the nameplate operating instructions are legible and facing outward.	5. Confirm that the extinguisher model is not subject to recall and is not obsolete.	6. Check the extinguisher records to determine hydrostatic test intervals.
7. Verify that the pull pin functions properly and examine for damage or corrosion by removing the pull pin.	8. Examine the handle and levers to ensure that they are undamaged and operable.	9. Verify that the valve stem is correctly extended and not corroded or damaged.
10. Verify that the pressure gauge is in the operable range.	11. Verify that the gauge operating pressure corresponds with the nameplate instructions.	12. Verify that the gauge face corresponds with the proper agent type.
13. Verify that the gauge threads are compatible with the valve body material.	14. Verify that the nozzle or hose assembly, or both, is unobstructed, by removing and examining the nozzle.	15. Confirm that the nozzle and hose assembly are correct for the model of extinguisher.
16. Verify that the hose and couplings are not cut, cracked, damaged, or deformed.	17. Examine the internal valve port surfaces and threads for signs of leakage or corrosion by removing the nozzle or hose assembly and reinstalling the nozzle and hose assembly securely after examination.	18. Verify that the hose retention band is secure and properly adjusted.
19. Weigh the extinguisher to verify that it corresponds to the weight listed on the nameplate.	20. Reinstall the ring pin and install a new tamper seal.	21. Clean exposed extinguisher surfaces to remove any foreign material.
22. Record the maintenance on the extinguisher tag or label.	23. Return the extinguisher to the hanger, bracket, or cabinet.	

S = Satisfactory **U = Unsatisfactory**

Extinguisher ID	Date	Inspector	Result	Notes

PORTABLE EXTINGUISHERS – MAINTENANCE

PA 4140 / 12-20

CARTRIDGE OPERATED DRY CHEMICAL / DRY POWDER EXTINGUISHERS

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document maintenance of portable fire extinguishers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. Portable Extinguishers – Maintenance – Annually – {Reference C16C1, C16C5} – Fire extinguishers shall be subjected to maintenance at intervals of not more than 1 year, at the time of hydrostatic test, or when specifically indicated by an inspection discrepancy or electronic notification. Maintenance of fire extinguishers should not be confused with inspection, which is a quick check of the extinguishers that is performed at least every 30 days. The following list is a sample of maintenance procedures that should be followed to determine deficiencies associated with cartridge operated dry chemical and dry powder hand portable fire extinguishers:

1. Visually examine the extinguisher for damage by removing the extinguisher from the hanger, bracket, or cabinet, and visually examine the extinguisher for damage, including pressure gauge, cylinder dents, repairs, general corrosion, hose or nozzle threads, handles, and levers.	2. Verify that the hanger, bracket, or cabinet is the proper one for the extinguisher.	3. Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted.
4. Verify that the nameplate operating instructions are legible and facing outward.	5. Confirm that the extinguisher model is not subject to recall and is not obsolete.	6. Verify the extinguisher hydrostatic test records to determine the hydrostatic test interval.
7. Invert the extinguisher and open the nozzle to ensure any pressure is relieved from the shell.	8. Remove the cartridge guard and check the integral components for damage or corrosion.	9. Unscrew the cartridge to examine the seal. (Replace the cartridge if the seal is punctured, damaged, or corroded.) Verify that the seal is not punctured, that it is the proper cartridge for that extinguisher, and that it has the proper manufacturer's seal.
10. Install the shipping cap on the cartridge.	11. Weigh the cartridge on a scale and verify the weight is within the tolerance specified in the manufacturer's service manual.	12. Remove the discharge nozzle from its holder and lift the hose, breaking the tamper seal.
13. Operate the puncture lever to verify proper operation.	14. Check and clean the pressure relief vent in the cartridge receiver in accordance with manufacturer's service manual.	15. Remove and examine the cartridge receiver gasket. Replace the gasket if brittle, compression set, cracked, cut, or missing.
16. Lubricate the gasket in accordance with the manufacturer's manual and install.	17. Slowly loosen the fill cap to relieve any trapped pressure and reinstall hand-tight.	18. Examine the hose, nozzle, and couplings for any damage.
19. Operate the discharge nozzle to verify proper operation.	20. Remove the nozzle tip in accordance with the manufacturer's service manual and verify the proper tip is installed and that it is not damaged. Install the nozzle tip in accordance with manufacturer's manual.	21. Remove the discharge hose from the extinguisher and ensure that the hose is not obstructed.
22. Examine the hose o-ring and replace if necessary.	23. Verify that the hose connection is clean and not damaged.	24. Install the hose on the extinguisher.
25. Remove the fill cap and examine the threads and seating surfaces for any damage or corrosion.	26. Verify that the pressure relief vent is not obstructed.	27. Verify that the dry chemical agent is the correct type and that there are no foreign materials or caking.
28. Examine and clean the fill cap, gasket, and indicator in accordance with manufacturer's manual.	29. Lubricate and install the fill cap and gasket in accordance with manufacturer's manual.	30. Secure the discharge hose in place and install the proper cartridge.
31. Replace the cartridge guard and install new tamper seals.	32. Record the maintenance on the extinguisher tag or label.	33. Return the extinguisher to the hanger, bracket, or cabinet.

S = Satisfactory **U = Unsatisfactory**

Extinguisher ID	Date	Inspector	Result	Notes

PORTABLE EXTINGUISHERS
INTERNAL / EXTERNAL INSPECTIONS

PA 4141 / 12-20

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document maintenance of portable fire extinguishers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Portable extinguishers – External Examination – Annually – {Reference C16C6} –** Conduct an annual external visual examination of all fire extinguishers to detect:
   a. obvious physical damage,
   b. corrosion, or nozzle blockage
   c. verify that the operating instructions are present, legible, and facing forward, and
   d. that the HMIS information is present and legible, and
   e. to determine if a 6-year internal examination or hydrostatic test is due.

- At the time of the maintenance, the tamper seal of a rechargeable fire extinguisher shall be removed by operating the pull pin or locking device.
- All removable extinguisher boots, foot rings, and attachments shall be removed to accommodate thorough annual cylinder examinations.

2. **Portable Extinguishers – Internal Examination – {Reference C16C7, C16C9, C16C10}** – Fire extinguishers shall be internally examined at intervals not exceeding those specified in Table 7.3.3.1.

Stored pressure loaded stream and antifreeze	1 year	Pump tank water and pump tank, calcium chloride	1 year
Dry chemical, cartridge and cylinder operated, with mild steel shells	1 year	Dry powder, cartridge and cylinder operated, with mild steel shells	1 year
Wetting agent	1 year	Stored pressure water	5 years
AFFF and FFFP	3 years	Stored pressure dry chemical, with stainless steel shells	5 years
Carbon dioxide	5 years	Wet Chemical	5 years
Dry chemical stored pressure, with mild steel shells, brazed brass shells, and aluminum shells	6 years	Halogenated agents	6 years
Dry powder, stored pressure, with mild steel shells	6 years		

S = Satisfactory **U = Unsatisfactory**

Extinguisher ID	Date	Inspector	Task/Result	Notes

PORTABLE EXTINGUISHERS

PA 4142 / 12-20

CARBON DIOXIDE/WHEELED EXTINGUISHERS – HOSE ASSEMBLIES AND REGULATORS

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document testing and maintenance of portable fire extinguishers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Electronic Monitoring – Testing/Maintenance – Annually – {Reference C16B2} –** Twenty percent of units shall be tested annually on a rotating basis so that all units are tested within a 5-year period. The components of the monitoring device/system shall be tested and maintained annually in accordance with the manufacturer's listed maintenance manual, with the following items included as a minimum:

1. Power supply inspection/battery change	2. Obstruction sensor inspection	3. Location sensor inspection
4. Pressure indication inspection	5. Connection continuity inspection (See 7.6.1.1 and 7.6.1.2.)	

2. **Carbon Dioxide Hose Assembly – Testing – Annually – {Reference C16C12} -** Carbon Dioxide Hose Assembly Conductivity Test. A conductivity test shall be conducted annually on all carbon dioxide hose assemblies.

3. **Wheeled Extinguisher Hoses – Maintenance – Annually – {Reference C16C14} –** Wheeled Unit Hoses. Discharge hoses on wheeled-type fire extinguishers shall be completely uncoiled and examined for damage annually. Discharge hoses on wheeled extinguishers shall be coiled in a manner to prevent kinks and to allow rapid deployment in accordance with the manufacturer's instructions.

4. **Wheeled Extinguisher Regulators – Maintenance – Annually – {Reference C16C14} –** Pressure Regulators. Pressure regulators provided with wheeled-type fire extinguishers shall be tested annually for outlet static pressure and flow rate in accordance with the manufacturer's instructions.

S = Satisfactory **U = Unsatisfactory**

Extinguisher ID	Date	Inspector	Task/Result	Notes

PORTABLE EXTINGUISHERS
RECHARGING / HYDROSTATIC TESTING

PA 4143 / 12-20

Building ID: **Total Number of Portable Extinguishers:**

- Use this form to document testing and maintenance of portable fire extinguishers.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

- **All rechargeable-type fire extinguishers shall be recharged after any use or when the need is indicated by an inspection or servicing. After recharging, a leak test shall be performed on stored-pressure and self-expelling types of fire extinguishers.**

1. **Pump Tank – Maintenance – Annually – {Reference C16D1, C16D2}** – Annually recharge pump tank water and pump tank calcium chloride–based antifreeze types of fire extinguishers with new chemicals or water as applicable.

2. **Wetting Agent – Maintenance – Annually – {Reference C16D1, C16D2} –** Annually replace the agent in stored-pressure wetting agent fire extinguishers.

3. **AFFF and FFFP – Maintenance – 3 Years – {Reference C16D1, C16D2} –** Replace the premixed agent in liquid charge–type AFFF and FFFP fire extinguishers at least once every 3 years.

4. **Hydrostatic Testing – Testing – As Identified – {Reference C16E1, C16E2} –** At intervals not exceeding those specified in Table 8.3.1, fire extinguishers shall be hydrostatically retested.

Stored-pressure water, water mist, loaded stream, and/or antifreeze	5 years	Wetting agent	5 years
AFFF (aqueous film forming foam)	5 year	FFFP (film-forming fluoroprotein foam)	5 year
Dry chemical with stainless steel shells	5 year	Carbon dioxide	5 years
Wet chemical	5 years	Dry chemical, stored pressure, with mild steel shells, brazed brass shells, or aluminum shells	12 years
Dry chemical, cartridge or cylinder operated, with mild steel shells	12 years	Halogenated agents	12 years
Dry powder, stored pressure, cartridge or cylinder operated, with mild steel shells	12 years		

5. **Hydrostatic Testing - Expellant Cylinders and Cartridges – Testing – 5 Years/10 Years – {Reference C16E3} –** Nitrogen cylinders, argon cylinders, carbon dioxide cylinders, or cartridges used for inert gas storage that are used as expellants for wheeled fire extinguishers and carbon dioxide extinguishers shall be hydrostatically tested every 5 years.
   - Cylinders (except those charged with carbon dioxide) complying with 49 CFR 180.209(b) shall be permitted to be hydrostatically 10 years in lieu of the requirement in 8.3.2.1.

6. **Hydrostatic Testing – Hose Assemblies – Testing – As Identified – {Reference C16E4} –** A hydrostatic test shall be performed on fire extinguisher hose assemblies equipped with a shutoff nozzle at the end of the hose. High-pressure and low-pressure accessory hose (other than agent discharge hose) used on wheeled extinguishers shall be hydrostatically tested.

S = Satisfactory **U = Unsatisfactory**

Extinguisher ID	Date	Inspector	Task/Result	Notes

CHAPTER 17 – VALVES, FIRE DEPARTMENT CONNECTIONS, AND OTHER APPURTENANCES

General Information

This Chapter applies to all valves, fire department connections, or other appurtenances that may or may not be covered in other Chapters of this Manual. Examples include, but are not limited to, curb box valves on water mains, post indicator valves on lead-in connections, control valves for wall hydrants, control valves on water supplies for water storage tanks, and backflow-preventers on water supply piping.

Noting that alarm valves, dry pipe valves, pre-action / deluge valves are a principal component of automatic sprinkler and standpipe systems, requirements for these valves are covered in Chapters 1 and 2 respectively. That information is not duplicated in this chapter.

Requirements for valves, such as pressure reducing valves, may be listed in other chapters and may be duplicated in this chapter. The requirements in all chapters are the same and can be referenced or cross referenced as necessary.

A. All Valves and Fire Department Connections

A1. Existing Valves General Information — Update — Form PA 4144

Frequency – Annually

Review General Information Form for Valves, update as required.

A2. New or Altered Valves General Information — Update — Form PA 4144

Frequency – As Required

Update General Information Form to add new or altered valves to include repairs and/or modifications to components.

A3. Existing Fire Department Connections General Information — Update — Form PA 4145

Frequency – Annually

Review General Information Form for Fire Department Connections, update as required.

A4. New or Altered Fire Department Connections – General Information — Update — Form PA 4145

Frequency – As Required

Review General Information Form for Fire Department Connections or update General Information Form for Fire Department Connections that have been altered to include repairs and/or modifications to components.

A5. Existing Air Compressors General Information — Update — Form PA 4146

Frequency – Annually

Review General Information Form for Fire Department Connections, update as required.

A6. New or Altered Air Compressors General Information — Update — Form PA 4146

Frequency – As Required

Review General Information Form for Fire Department Connections or update General Information Form for Fire Department Connections that have been altered to include repairs and/or modifications to components.

A7. Existing Backflow Prevention Assemblies General Information — Update — Form PA 4144

Frequency – Annually

Review General Information Form for Fire Department Connections, update as required.

A8. New or Altered Backflow Prevention Assemblies – General Information — Update — Form PA 4144

Frequency – As Required

Review General Information Form for Fire Department Connections or update General Information Form for Fire Department Connections that have been altered to include repairs and/or modifications to components.

B. Control Valves

In addition to A above, the following is required for Control Valves

General Requirements for Control Valves

NFPA 25 2017 13.2.3*	All system valves shall be protected from physical damage and shall be accessible.
NFPA 25 2017 A.13.2.3	The valves are not required to be exposed. Doors, removable panels, or valve pits can be permitted to satisfy this requirement. Such equipment should not be obstructed by features such as walls, ducts, columns, direct burial, or stock storage.
NFPA 25 2017 13.3.1*	Each control valve shall be identified and have a sign indicating the system or portion of the system it controls.
NFPA 25 2017 A.13.3.1	Signs identifying underground fire service main control valves in roadway boxes should indicate the direction of valve opening, the distance and direction of the valve from the sign location (if the valve is subject to being covered by snow or ice), and the location of the wrench if not located with the sign.
NFPA 25 2017 13.3.1.1	Systems that have more than one control valve that must be closed to work on a system shall have a sign on each affected valve referring to the existence and location of other valves.
NFPA 25 2017 13.3.1.2*	When a normally open valve is closed, the procedures established in Chapter 15 shall be followed.

NFPA 25 2017 A.13.3.1.2 — Valves that normally are closed during cold weather should be removed and replaced with devices that provide continuous fire protection service.

NFPA 25 2017 13.3.1.3 — Each normally open valve shall be secured by means of a seal or a lock or shall be electrically supervised in accordance with the applicable NFPA standards.

NFPA 25 2017 13.3.1.4 — Normally closed valves shall be secured by means of a seal or shall be electrically supervised in accordance with the applicable NFPA standard.

NFPA 25 2017 13.3.1.5 — Sealing or electrical supervision shall not be required for hose valves.

B1. Control Valves in Water-Based Fire Protection Systems — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1	Weekly	All valves shall be inspected weekly.	PA 4148
NFPA 25 2017 13.3.2.1.1	Monthly	Valves secured with locks or supervised in accordance with applicable NFPA standards shall be permitted to be inspected monthly.	PA 4148
NFPA 25 2017 13.3.2.1.2	Quarterly NYS Only	Valves that are electrically supervised shall be permitted to be inspected quarterly.	PA 4148
NFPA 25 2017 13.3.2.2*		The valve inspection shall verify that the valves are in the following condition: (1) In the normal open or closed position (2) * Sealed, locked, or supervised (3) Accessible (4) Post indicator valves (PIVs) are provided with correct wrenches (5) Free from external leaks (6) Provided with applicable identification	
NFPA 25 2017 A.13.3.2.2		Valves should be kept free of snow, ice, storage, or other obstructions so that access is ensured.	
NFPA 25 2017 A.13.3.2.2(2)		The purpose of the valve sealing program is as follows: (1) The presence of a seal on a control valve is a deterrent to closing a valve indiscriminately without obtaining the proper authority. (2) A broken or missing seal on a valve is cause for the plant inspector to verify that protection is not impaired and to notify superiors of the fact that a valve could have been closed without following procedures.	

B2. Control Valves in Water-Based Fire Protection Systems — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.3.1	Annually	Each control valve shall be operated annually through its full range and returned to its normal position.	PA 4148
NFPA 25 2017 13.3.3.2*		Post indicator valves shall be opened until spring or torsion is felt in the rod, indicating that the rod has not become detached from the valve.	
NFPA 25 2017 A.13.3.3.2		A proper wrench needs to be used for this test. Using an improper wrench such as a pipe wrench has resulted in damage to the operating nut. The use of break over bars and extensions on the wrench can damage the valve and/or the post. If the valve cannot be closed and reopened using the proper wrench with reasonable force, then some maintenance and/or repairs are necessary so the valve can be operated when needed in a fire event. These “spring tests” are made to verify that a post indicator valve is fully open. If an operator feels the valve is fully open, he or she should push in the “open” direction. The handle usually moves a short distance (approximately a one-quarter turn) and “springs” back toward the operator in a subtle move when released. This spring occurs when the valve gate pulls up tight against the top of its casting and the valve shaft (being fairly long) twists slightly. The spring indicates that the valve is	

		fully opened and that the gate is attached to the handle. If the gate is jammed due to a foreign particle, the handle is not likely to spring back. If the gate is loose from the handle, the handle continues to turn in the "open" direction with little resistance.	
NFPA 25 2017 13.3.3.2.1		This test shall be conducted every time the valve is closed.	
NFPA 25 2017 13.3.3.3		Post indicator and outside screw and yoke valves shall be backed a one-quarter turn from the fully open position to prevent jamming.	
NFPA 25 2017 13.3.3.4*		A valve status test shall be conducted any time the control valve is closed and reopened at system riser.	
NFPA 25 2017 A.13.3.3.4		See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.3.4.1	Annually	The operating stems of outside screw and yoke valves shall be lubricated annually.	PA 4148
NFPA 25 2017 13.3.4.2		The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.	

B3. Control Valves – Supervisory Devices — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.3.2.1.3	Quarterly	Control valve supervisory alarm devices shall be inspected quarterly to verify that they are free of physical damage.	PA 4148
NFPA 25 2017 13.3.3.5.1	SemiAnnually	Valve supervisory switches shall be tested semiannually.	PA 4148
NFPA 25 2017 13.3.3.5.2		A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.	
NFPA 25 2017 13.3.3.5.3		The signal shall not be restored at any valve position except the normal position.	

C. Check Valves

In addition to A above, the following is required for Check Valves

C1. Check Valves — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.4.2.1	5 Years	Inspection. Valves shall be inspected internally every 5 years to verify that all of the valve's components operate correctly.	PA 4149
NFPA 25 2017 13.4.2.2	As Necessary	Maintenance. Internal components shall be cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.	PA 4149

D. Hose Valves

In addition to A above, the following is required for Hose Valves

D1. Hose Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.6.1.1	Quarterly	Hose valves shall be inspected quarterly to verify that the valves are in the following condition: (1) Hose caps are in place and not damaged. (2) Hose threads are not damaged. (3) Valve handles are present and not damaged. (4) Gaskets are not damaged or showing signs of deterioration. (5) No leaks are present. (6) Valves are not obstructed or otherwise not capable of normal operation.	PA 4149
NFPA 25 2017 13.6.1.2		Hose valves shall be inspected to ensure that hose caps are in place and not damaged.	
NFPA 25 2017 13.6.1.3		Hose threads shall be inspected for damage.	
NFPA 25 2017 13.6.1.4		Valve handles shall be present and not damaged.	
NFPA 25 2017 13.6.1.5		Gaskets shall be inspected for damage or deterioration.	
NFPA 25 2017 13.6.1.6		Hose valves shall be inspected for leaks.	
NFPA 25 2017 13.6.1.7		Hose valves shall be inspected to ensure no obstructions are present.	
NFPA 25 2017 13.6.1.8		Hose valves shall be inspected to ensure that restricting devices are present.	

D2. Hose Valves — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.6.2.1*	Annually	Class I and Class III standpipe system hose valves shall be tested annually by fully opening and closing the valves.	PA 4149
NFPA 25 2017 A.13.6.2.1		Hose valves can be tested without a full flow if the cap is left on the hose threads. The purpose of this requirement is to exercise the valve so it can be operated easily.	
NFPA 25 2017 13.6.2.1.1		Class I and Class III standpipe system hose valves that are difficult to operate or leak shall be repaired or replaced.	
NFPA 25 2017 13.6.2.2*	3 Years	Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems shall be tested every 3 years by opening and closing the valves.	PA 4149
NFPA 25 2017 A.13.6.2.2		See A.13.6.2.1.	
NFPA 25 2017 13.6.2.2.1		Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems that are difficult to operate or leak shall be repaired or replaced.	

D3. Hose Valves — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.6.3		Maintenance. Hose valves that do not operate smoothly or open fully shall be lubricated, repaired, or replaced.	PA 4149

E. Pressure Reducing & Relief Valves

In addition to A above, the following is required for Pressure Reducing & Relief Valves

General Requirement for Pressure Reducing or Pressure Regulating Valves

NFPA 25 2017 6.3.1.5 — Standpipes, sprinkler connections to standpipes, or hose stations equipped with pressure-reducing valves or pressure-regulating valves shall have these valves inspected, tested, and maintained in accordance with the requirements of Chapter 13.

E1. Pressure Reducing & Relief Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.1.1	Quarterly	All valves shall be inspected quarterly to verify that the valves are in the following condition: (1) In the open position (2) Not leaking (3) Maintaining downstream pressures in accordance with the design criteria (4) Handwheels installed and unbroken	PA 4147

E2. Pressure Reducing & Relief Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.1.3	Annually	A partial flow test adequate to move the valve from its seat shall be conducted annually.	PA 4147
NFPA 25 2017 13.5.1.2	5 Years	A full flow test shall be conducted on each valve at 5-year intervals and shall be compared to previous test results.	PA 4147
NFPA 25 2017 13.5.1.2.1		Adjustments shall be made in accordance with the manufacturer's instructions.	

E3. Pressure Reducing & Relief Valves — Inspection
Hose Connection/Hose Rack Assembly

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.2		Hose Connection Pressure-Regulating Devices	
NFPA 25 2017 13.5.2.1	Annually	All devices shall be inspected annually to verify the following: (1) The handwheel is not broken or missing. (2) The outlet hose threads are not damaged. (3) No leaks are present. (4) The hose adapter and the cap are not missing.	PA 4147
NFPA 25 2017 13.5.3		Hose Rack Assembly Pressure-Regulating Devices	
NFPA 25 2017 13.5.3.1	Annually	All devices shall be inspected annually to verify the following: (1) The handwheel is not missing or broken. (2) No leaks are present.	PA 4147

E4. Pressure Reducing & Relief Valves Hose Connection/Hose Rack Assembly — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.2		Hose Connection Pressure-Regulating Devices	
NFPA 25 2017 13.5.2.3	Annually	A partial flow test adequate to move the device from its seat shall be conducted annually.	PA 4147
NFPA 25 2017 13.5.2.2*	5 Years	A full flow test shall be conducted on each device at 5-year intervals and shall be compared to previous test results.	PA 4147
NFPA 25 2017 A.13.5.2.2		PRV devices can be bench tested in accordance with the manufacturer's instructions or tested in place. To test in place, a gauge is connected on both the inlet side and the outlet side of the device, and flow readings are taken using a Pitot tube or a flowmeter. Water is discharged through a roof manifold, if available, or through hose to the exterior of the building. Another acceptable method for systems having at least two risers is to take one standpipe out of service and use it as a drain by removing PRV devices and attaching hoses at the outlets near the ground floor level. When testing in this manner, a flowmeter should be used and a hose line utilized to connect the riser being tested and the drain riser. Readings are to be compared to the system's hydraulic demands at the test location. Field-adjustable valves are to be reset in accordance with manufacturer's instructions. Nonadjustable valves should be replaced. Extreme caution should be exercised because of the high pressure involved when testing. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.5.2.2.1		Adjustments shall be made in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.5.3		Hose Rack Assembly Pressure-Regulating Devices	
NFPA 25 2017 13.5.3.3	Annually	A partial flow test adequate to move the device from its seat shall be conducted annually.	PA 4147
NFPA 25 2017 13.5.3.2	5 Years	A full flow test shall be conducted on each device at 5-year intervals and compared to previous test results.	PA 4147
NFPA 25 2017 13.5.3.2.1		Adjustments shall be made in accordance with the manufacturer's instructions.	

E5. Master Pressure-Regulating Devices — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.4.1	Weekly	Devices shall be inspected weekly to verify that the devices are in the following condition: (1) *Normal downstream pressures are maintained. (2) Normal supply pressure is maintained. (3) Devices and associated trim components are free of physical damage and are not leaking.	PA 4147
NFPA 25 2017 A.13.5.4.1(1)		Pressures downstream of the master PRV should not exceed the maximum pressure rating of the system components.	
NFPA 25 2017 13.5.4.2*	Quarterly	A partial flow test adequate to move the valve from its seat shall be conducted quarterly.	PA 4147
NFPA 25 2017 A.13.5.4.2		The partial flow test of the master PRV can be performed during the quarterly main drain test. (See 13.2.5.2.)	
NFPA 25 2017 13.2.5.2		In systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves, the main drain test of at least one system downstream of the device shall be conducted on a quarterly basis.	
NFPA 25 2017 13.5.4.3	Annually	A full flow test shall be conducted on each valve annually and shall be compared to previous test results.	PA 4147
NFPA 25 2017 13.5.4.4		When valve adjustments are necessary, they shall be made in accordance with the manufacturer's instructions.	

E6. Pressure Reducing & Relief Valves — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.5.5.1		All pressure-reducing valves installed on fire protection systems not covered by 13.5.1, 13.5.2, 13.5.3, or 13.5.4 shall be inspected in accordance with 13.5.1.1.	
NFPA 25 2017 13.5.1.1	Quarterly	All valves shall be inspected quarterly to verify that the valves are in the following condition: (1) In the open position (2) Not leaking (3) Maintaining downstream pressures in accordance with the design criteria (4) Handwheels installed and unbroken	PA 4147
NFPA 25 2017 13.5.5.2		All pressure-reducing valves installed on fire protection systems not covered by 13.5.1, 13.5.2, 13.5.3, or 13.5.4 shall be tested in accordance with 13.5.1.2.	
NFPA 25 2017 13.5.1.2	5 Years	A full flow test shall be conducted on each valve at 5-year intervals and shall be compared to previous test results.	PA 4147
NFPA 25 2017 13.5.1.2.1		Adjustments shall be made in accordance with the manufacturer's instructions.	

F. Backflow Prevention Assemblies

In addition to A above, the following is required for Backflow Prevention Assemblies

General Requirement for Backflow Prevention Assemblies

NFPA 25 2017 13.7.1 — Inspection of backflow prevention assemblies shall be as described in 13.7.1.1 through 13.7.1.3.

F1. Backflow Prevention Assemblies — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.7.1.1	Weekly	Reduced-pressure assemblies and reduced-pressure detector assemblies shall be inspected weekly to ensure that the differential-sensing valve relief port is not continuously discharging.	PA 4150
NFPA 25 2017 13.7.1.2		After any testing or repair, an inspection by the property owner or designated representative shall be made to ensure that the system is in service and all isolation valves are in the normal open position and properly locked or electrically supervised.	
NFPA 25 2017 13.7.1.3*	5 Years	Backflow prevention assemblies shall be inspected internally every 5 years to verify that all components operate correctly, move freely, and are in good condition.	PA 4150
NFPA 25 2017 A.13.7.1.3		Where annual maintenance includes an internal inspection performed by a qualified person, this requirement is satisfied.	

F2. Backflow Prevention Assemblies — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.7.2.1*	Annually	All backflow preventers installed in fire protection system piping shall be exercised annually by conducting a forward flow test at a minimum flow rate of the system demand.	PA 4150
NFPA 25 2017 A.13.7.2.1		The full flow test of the backflow prevention valve can be performed with a test header or other connections downstream of the valve. A bypass around the check valve in the fire department connection line with a control valve in the normally closed position can be an acceptable arrangement. When flow to a visible drain cannot be accomplished, closed loop flow can be acceptable if a flowmeter or sight glass is incorporated into the system to ensure flow.	
NFPA 25 2017 13.7.2.1.1		Where water rationing is enforced during shortages lasting more than 1 year, an internal inspection of the backflow preventer to ensure the check valves will fully open shall be permitted in lieu of conducting the annual forward flow test.	
NFPA 25 2017 13.7.2.1.2		The forward flow test shall not be required where annual fire pump testing causes the system flow rate to flow through the backflow preventer device.	

NFPA 25 2017 13.7.2.2		Where hydrants or inside hose stations are located downstream of the backflow preventer, the forward flow test shall include hose stream demand.	
NFPA 25 2017 13.7.2.3		Where connections do not permit verification of the forward flow test at the minimum flow rate of system demand, tests shall be conducted at the maximum flow rate possible.	
NFPA 25 2017 13.7.3	As Required	Maintenance. Maintenance of all backflow prevention assemblies shall be conducted by a qualified individual following the manufacturer's instructions in accordance with the procedure and policies of the authority having jurisdiction.	PA 4150

G. Fire Department Connections

In addition to A above, the following is required for Fire Department Connections

G1. Fire Department Connections — Inspection / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.8.1	Quarterly	Fire department connections shall be inspected quarterly to verify the following: (1) Fire department connections are visible and accessible. (2) Couplings or swivels are not damaged and rotate smoothly. (3) Plugs or caps are in place and undamaged. (4) Gaskets are in place. (5) Identification signs are in place. (6) Check valve is not leaking. (7) Automatic drain valve is in place and operating properly. (8) Fire department connection clapper(s) is in place and operating properly. (9) * Interior of the connection is inspected for obstructions. (10) Visible piping supplying the fire department connection is undamaged.	PA 4151
NFPA 25 2017 A.13.8.1(9)		It is not the intent of this section for all fire department connection piping to be inspected for obstructions but only the interior of the connection itself.	
NFPA 25 2017 13.8.2	Annually	Interior inspections shall be conducted annually if approved locking caps or locking plugs are installed.	PA 4151
NFPA 25 2017 13.8.3		Components shall be repaired or replaced as necessary in accordance with the manufacturer's instructions.	
NFPA 25 2017 13.8.4		Any obstructions that are present shall be removed.	

G2. Fire Department Connections – Standpipe Systems — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.8.5	5 Years	The piping from the fire department connection to the fire department check valve shall be hydrostatically tested at 150 psi (10 bar) for 2 hours at least once every 5 years.	PA 4151
FCNYC 2014 912.6	5 Years	Sprinkler system and standpipe system fire department connections shall be periodically inspected, tested, serviced and otherwise maintained in accordance with FC901.6 and NFPA 25. Upon order of the commissioner, but at least once every 5 years, such fire department connections shall be subjected to a hydrostatic pressure test to demonstrate their suitability for department use. The test shall be conducted in accordance with the rules and at the owner's risk, by his or her representative before a representative of the department.	PA 4151
RCNY 2019 912-01		(c) Standpipe Pressure and Flow Tests. Standpipe systems shall be tested in accordance with the following procedures: (1) Hydrostatic test (A) A pressure of 50 psi in excess of static pressure shall be applied to the entire system before replacing clappers in fire department connection check valves. Where intermediate tanks are provided, static pressure must be calculated from the roof tank. (B) The test connection shall be made at the fire department connection. (C) Standpipe systems shall not be tested using air or other pneumatic methods. (2) Flow test	

		(A) No flow test shall be conducted when the outdoor ambient temperature is below 32°F. (B) Shut off supply to system (gravity tank or street supply). (C) Drain system at lowest outlet available. (D) Remove all lower check valve clappers and then replace the bonnet. (E) Connect a control valve to each fire department connection. The contractor shall provide a hose or make other provisions for draining of the water, so arranged as to hold the fire department connection clapper in an open position. (F) Open the tank control valve or the street control valve and fill the entire system. (G) Stretch the hose to curb or to a drain, and flush each fire department connection until water runs clear. Shut the water off as soon as it runs clear. (3) System restoration (A) Restore the system by replacing clappers in check valve, opening all control valves and filling the system. (B) Properly vent all dead ends. (C) Inspect drips after protection is restored, to check if the lower check valves are leaking. (D) The contractor shall endeavor to ensure that the standpipe system is not out of service overnight. If it is impracticable to restore the system for Fire Department use, the certificate of fitness holder shall notify the owner or building manager and the Department, by telephoning the Department communications office (dispatcher) for the borough in which the premises is located. If the certificate of fitness holder is not present, the contractor shall make such notifications.	

G3. Fire Department Connections – Sprinkler Systems Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.8.5	5 Years	The piping from the fire department connection to the fire department check valve shall be hydrostatically tested at 150 psi (10 bar) for 2 hours at least once every 5 years.	PA 4151
NYCFC 2014 912.6	5 Years	Sprinkler system and standpipe system fire department connections shall be periodically inspected, tested, serviced and otherwise maintained in accordance with FC901.6 and NFPA 25. Upon order of the commissioner, but at least once every 5 years, such fire department connections shall be subjected to a hydrostatic pressure test to demonstrate their suitability for department use. The test shall be conducted in accordance with the rules and at the owner's risk, by his or her representative before a representative of the department.	PA 4151
RCNY-2019 912-01		(d) Sprinkler System Pressure Test (1) The fire department connections for a sprinkler system shall be hydrostatically pressure tested by applying a hydrostatic pressure of 100 psig directly to each fire department connection and satisfactorily maintaining such pressure for not less than 20 minutes. Fire department connections may be isolated from the sprinkler system in accordance with the following procedures: (A) If the fire department connection check valve is of the flange type, a blind gasket or blank disc shall be installed between the flanges at the inlet (dry side) of check valve. (B) If the fire department connection check valve is the screw type valve without flanges, the line at the dry side of check valve shall be cut and the end capped. (C) When the test is completed, the blind gasket or blank disc shall be removed and flange gasket replaced. If the pipe was cut to conduct the test, it shall be provided with flanges after the test so that it can be used when future tests are conducted. (D) After blind gaskets or blank disc are removed and piping is properly reconnected, a final test equal to city main pressure shall be applied to the fire department connection header to check that the flange connection is water tight. (E) When the test is completed, the fire department connection header shall be drained and the drip valve left in good working order. (F) When the fire department connections for perforated pipe systems are tested, the perforated branch lines shall be backed out and openings plugged. (2) Pneumatic testing. Sprinkler system fire department connections shall not be tested using air or other pneumatic methods. (3) System restoration (A) If the fire department connection is isolated during the hydrostatic testing, the system shall be restored by removing plugs and reconnecting branch lines. (B) The contractor shall endeavor to ensure that the sprinkler system is not out of service overnight. If it is impracticable to restore the system for Fire Department use, the certificate of fitness holder and/or impairment coordinator supervising	

			such testing shall comply with the out-of-service fire protection system requirements of FC901.7, including notification to the Department by telephoning the Department communications office (dispatcher) for the borough in which the premises is located. If the certificate of fitness holder or impairment coordinator is not present, the contractor shall notify the owner or building manager and the Department.	

H. Air Compressors

In addition to A above, the following is required for Air Compressors.

General Requirements for Air Compressors

NFPA 25 2017 13.10.1 — Air compressors dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with 13.10.2, 13.10.3, and 13.10.4.

NFPA 25 2017 13.10.1.1 — Air compressors not dedicated to water-based fire protection systems shall be inspected, tested, and maintained in accordance with the manufacturer's instructions.

H1. Air Compressors — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.10.2.1	Monthly	Air compressors dedicated to water-based fire protection systems shall be inspected monthly to verify the following: (1) Air compressor is free of physical damage. (2) Power wiring to the air compressor is intact and free of physical damage. (3) Piping from the air compressor to the fire protection system is intact and free of physical damage. (4) The means of anchoring the air compressor to the structure or to the system piping is secure, tight, and free of physical damage. (5) Air compressors requiring oil have the required amount of oil in the oil reservoir.	PA 4150

H2. Air Compressors — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.10.3.1	Annually	Air compressors dedicated to water-based fire protection systems shall be tested annually to verify the following: (1) Air compressor operates as intended on the proper drop of air pressure in the fire protection system. (2) Air compressor restores normal air pressure in the fire protection system in the required time frame. (3) Air compressor does not overheat while running.	PA 4150

H3. Air Compressors — Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.10.4.1	As per Manufacturers Instructions	Air compressors dedicated to water-based fire protection systems shall be maintained in accordance with the manufacturer's instructions.	PA 4150
NFPA 25 2017 13.10.4.2	Annually	Compressors requiring oil shall have the oil replaced on an annual basis unless the manufacturer's instructions require more frequent replacement.	

I. Component Testing Requirements

I1. Component Testing Requirements — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 25 2017 13.11.1	As per Table 13.11.1	Whenever a valve, valve component, and/or valve trim is adjusted, repaired, reconditioned, or replaced, the action required in Table 13.11.1 shall be performed.	
NFPA 25 2017 13.11.2		Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.	
NFPA 25 2017 13.11.3*		These actions shall not require a design review.	
NFPA 25 2017 A.13.11.3		Design review is outside the scope of this standard.	

Table 13.11.1 Summary of Component Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Inspection, Test, and Maintenance Procedures
Water delivery components				
Post indicator and wall indicator valves	X	X	X	(1) Inspect for leaks at system pressure (2) Perform full operational test conforming to 13.3.3.1 (3) Perform spring torsion inspection conforming to 13.3.3.1 and 13.3.3.2 (4) Verify target visibility at shut and full open position (5) Test supervisory device (6) Main drain test
Control valves other than post indicator and wall indicator valves	X	X	X	(1) Inspect for leaks at system pressure (2) Perform full operational test conforming to 13.3.3.1 (3) Perform spring torsion inspection for OS&Y valves conforming to 13.3.3.2 (4) Verify supervisory device (5) Main drain test
Alarm check valve	X	X	X	(1) Inspect for leaks at system pressure per 13.4.1 (2) Test all alarms and supervisory signals affected by the alarm valve (3) Main drain test
Dry pipe valve	X	X	X	(1) Inspect for leaks at system pressure (2) Trip test per 13.4.5.2 (3) Inspect condition of valve seat (4) Test all dry pipe system alarms and supervisory signals (5) Main drain test
Deluge/preaction valve	X	X	X	(1) Inspect for leaks at system pressure per 13.4.4/13.4.3 (2) Trip test (3) Inspect condition of valve seat (4) Test all deluge/preaction system alarms and supervisory signals (5) Main drain test
Quick-opening device	X	X	X	(1) Inspect for leaks at system pressure per 13.4.5.2.9 (2) Trip test (3) Main drain test
Pressure-regulating device — hose valves	X	X	X	(1) Inspect for leaks at system pressure per 13.5.2 (2) Full flow test (3) Main drain test (Only when a control valve has been closed)
Pressure-regulating devices — other than hose valves	X	X	X	(1) Inspect for leaks at system pressure per Section 13.5 (2) Test pressure setting with full flow and without flow (3) Test supervisory device and alarm (4) Main drain test

(continues)

Table 13.11.1 *Continued*

Component	Adjust	Repair/ Recondition	Replace	Inspection, Test, and Maintenance Procedures
Hose valve	X	X	X	(1) Inspect for leaks at system pressure per Section 13.6 (2) Main drain test
Backflow prevention device	X	X	X	(1) Inspect for leaks at system pressure per Section 13.7 (2) Forward flow test per 13.7.2.1 (3) Test supervisory device and alarm (4) Main drain test
Check valves	X	X	X	(1) Inspect for leaks at system pressure per 13.4.2 (2) Inspect for leaking through check valve (3) Main drain test
Fire department connection	X	X		(1) Inspect for leaks at system pressure per Section 13.8 (2) Main drain test (Only when a control valve has been closed)
Fire department connection — sprinkler system(s)			X	(1) Isolate and hydrostatic test for 2 hours at 150 psi (10 bar) (2) Main drain test (Only when a control valve has been closed)
Fire department connection — other than sprinkler system(s)			X	(1) Isolate and hydrostatic test for 2 hours at 50 psi (3.5 bar) above the normal working pressure [200 psi (14 bar) minimum] (2) Main drain test (Only when a control valve has been closed)
Strainers	X	X	X	Inspect and clean in accordance with manufacturer's instructions
Main drain valves	X	X	X	Main drain test per 13.2.5
Gauges			X	Calibrate per 13.2.7
Alarm and supervisory components				
Alarm device	X	X	X	Test for conformance with NFPA 13 and/or *NFPA 72*
Supervisory device	X	X	X	Test for conformance with NFPA 13 and/or *NFPA 72*
System protection components				
Pressure relief valve — fire pump installation	X	X	X	See 8.3.3.8 and 13.5.6
Pressure relief valve — other than fire pump installation			X	Verify relief valve is listed or approved for the application and set to the correct pressure
Informational components				
Identification signs	X	X	X	Inspect for compliance with NFPA 13 and 13.3.1

VALVES AND FIRE DEPARTMENT CONNECTIONS

PA 4144 / 12-20

GENERAL INFORMATION - VALVES

Building ID: **Total Number of Valves:**

1. Valve identification – Provide a unique identifier for each valve.
2. Provide the location of valve.
3. Identify the type of valve - Check, Backflow Prevention Assembly, OS&Y, Butterfly, Pressure Reducing, etc.
4. Identify if control valve is sealed (S), locked (L), or electronically supervised with a tamper switch (T).
5. Provide any other pertinent information in Notes.

Valves to be included are those not accounted for in other system information including check valves, backflow prevention assemblies, pressure reducing & relief valves, etc.

Valve ID	Location	Type of Valve	(S)ealed, (L)ocked (T)amper	Notes

VALVES AND FIRE DEPARTMENT CONNECTIONS

PA 4145 / 12-20

GENERAL INFORMATION – FIRE DEPARTMENT CONNECTIONS

Building ID: **Total Number of Fire Dept. Connections:**

1. Fire Department Connection (FDC) Identification - Provide a unique identifier for each FDC.
2. Provide the location of Fire Department Connection.
3. Identify the number of hose connections and diameter. Example - 2, 2-1/2 inches.
4. Identify the hose connection thread type: NST = National Standard Thread; NYC = New York Corporation thread.
5. Provide any other pertinent information in Notes.

FDC ID	Location	Hose Connection(s) Size(s)	Hose Thread Type	Notes

VALVES AND FIRE DEPARTMENT CONNECTIONS
GENERAL INFORMATION – AIR COMPRESSORS

PA 4146 / 12-20

Building ID: **Total Number of Air Compressors:**

1. Air Compressor Identification - Provide a unique identifier for each air compressor.
2. Provide the location of air compressor.
3. Identify the fire protection system that the compressor serves.
4. Provide any other pertinent information in Notes.

Air Compressor ID	Location	System Served	Notes

WATER BASED FIRE PROTECTION SYSTEMS
PRESSURE REDUCING VALVES – INSPECTIONS/TESTING/MAINTENANCE

PA 4147 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of pressure reducing valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Pressure Reducing & Relief Valves – Inspection – Quarterly – {Reference C17E1, C17E6}** – All valves shall be inspected quarterly to verify that the valves are in the following condition:
   (1) In the open position
   (2) Not leaking
   (3) Maintaining downstream pressures in accordance with the design criteria
   (4) Handwheels installed and unbroken

2. **Pressure Reducing & Relief Valves – Testing/Maintenance – Annually – {Reference C17E2} –** A partial flow test adequate to move the valve from its seat shall be conducted annually. Adjustments shall be made in accordance with the manufacturer's instructions.

3. **Pressure Reducing & Relief Valves – Testing/Maintenance – 5 Years – {Reference C17E2, C17E6} –** A full flow test shall be conducted on each valve at 5-year intervals and shall be compared to previous test results. Adjustments shall be made in accordance with the manufacturer's instructions.

4. **Pressure Regulating Valves – Hose Connection/Hose Rack Assembly – Inspection – Annually – {Reference C17E3} –** Identify and conduct annual inspections of all valves to verify they are in the following condition:

Hose Connection Pressure-Regulating Devices.	**Hose Rack Assembly Pressure-Regulating Devices.**
(1) The handwheel is not broken or missing. (2) The outlet hose threads are not damaged. (3) No leaks are present. (4) The hose adapter and the cap are not missing.	(1) The handwheel is not missing or broken. (2) No leaks are present.

5. **Pressure Regulating Valves – Hose Connection/Hose Rack Assembly – Testing / Maintenance – Annually – {Reference C17E4}** – A partial flow test adequate to move the device from its seat shall be conducted annually. Adjustments shall be made in accordance with the manufacturer's instructions.

6. **Pressure Regulating Valves – Hose Connection/Hose Rack Assembly – Testing/Maintenance – 5 Years – {Reference C17E4}** – A full flow test shall be conducted on each device at 5-year intervals and shall be compared to previous test results. Adjustments shall be made in accordance with the manufacturer's instructions.

7. **Master Pressure-Regulating Devices – Inspection – Weekly – {Reference C17E5} –** Devices shall be inspected weekly to verify that the devices are in the following condition:
   (1) *Normal downstream pressures are maintained.
   (2) Normal supply pressure is maintained.
   (3) Devices and associated trim components are free of physical damage and are not leaking.

8. **Master Pressure-Regulating Devices – Testing/Maintenance – Quarterly – {Reference C17E5} –** A partial flow test adequate to move the valve from its seat shall be conducted quarterly.

9. **Master Pressure-Regulating Devices – Testing/Maintenance – Annually – {Reference C17E5} –** A full flow test shall be conducted on each valve annually and shall be compared to previous test results.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

WATER BASED FIRE PROTECTION SYSTEMS
CONTROL VALVES – INSPECTION / TESTING / MAINTENANCE

PA 4148 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of control valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Control Valves – Inspection – Weekly/Monthly/Quarterly – {Reference C17B1} –** Identify and inspect control valves. The valve inspection shall verify that the valves are in the following condition:
   (1) In the normal open or closed position
   (2) Sealed, locked, or supervised
   (3) Accessible
   (4) Post indicator valves (PIVs) are provided with correct wrenches
   (5) Free from external leaks
   (6) Provided with applicable identification

2. **Control Valves – Testing and Maintenance – Annually – {Reference C17B2} –** Identify and perform routine testing and maintenance of each control valve by operating through its full range and returning to its normal position. Lubricate operating stems of outside screw and yoke valves.

3. **Control Valve – Supervisory Devices – Inspection – Quarterly – {Reference C17B3} –** Identify and inspect control valve supervisory alarm devices to verify that they are free of physical damage.

4. **Control Valve – Supervisory Devices – Testing – SemiAnnually – {Reference C17B3} –** Identify and test valve supervisory switches demonstrating a distinctive signal when the valve is moved from its normal position.

S = Satisfactory **U = Unsatisfactory**

Control Valve ID / System ID	Date	Inspector	Task/Result	Notes

WATER BASED FIRE PROTECTION SYSTEMS
CHECK VALVES/HOSE VALVES – INSPECTION/TESTING/MAINTENANCE

PA 4149 / 12-20

Building ID: **System ID:**

- Use this form to document inspection, testing, maintenance of check valves and hose valves.
- Record "S" to indicate a satisfactory result or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Check Valves – Inspection/Maintenance – 5 Years – {Reference C17C1}** – Valves shall be inspected internally every 5 years to verify that all of the valve's components operate correctly. Internal components shall be cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.

2. **Hose Valves – Inspection – Quarterly – {Reference C17D1} –** Hose valves shall be inspected quarterly to verify that the valves are in the following condition:

1. Hose caps are in place and not damaged.	2. Hose threads are not damaged.	3. Valve handles are present and not damaged.
4. Gaskets are not damaged or showing signs of deterioration.	5. No leaks are present.	6. Valves are not obstructed or otherwise not capable of normal operation.

3. **Hose Valves – Testing/Maintenance – Annually/3 Years – {Reference C17D2, C17D3}**
   - Class I and Class III standpipe system hose valves shall be tested annually by fully opening and closing the valves.
   - Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems shall be tested every 3 years by opening and closing the valves.
   - Hose valves that do not operate smoothly or open fully shall be lubricated, repaired, or replaced.

S = Satisfactory **U = Unsatisfactory**

Check Valve ID / Hose Valve ID	Date	Inspector	Task/Result	Notes

WATER BASED FIRE PROTECTION SYSTEMS
BACKFLOW PREVENTION ASSEMBLIES/AIR COMPRESSORS INSPECTIONS/TESTING/MAINTENANCE

PA 4150 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of backflow prevention assemblies and air compressors.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Backflow Prevention Assemblies – Inspection – Weekly – {Reference C17F1} –** Reduced-pressure assemblies and reduced-pressure detector assemblies shall be inspected weekly to ensure that the differential-sensing valve relief port is not continuously discharging.

2. **Backflow Prevention Assemblies – Inspection – 5 Years – {Reference C17F1} –** Backflow prevention assemblies shall be inspected internally every 5 years to verify that all components operate correctly, move freely, and are in good condition.

3. **Backflow Prevention Assemblies – Testing/Maintenance – Annually – {Reference C17F1} –** All backflow preventers installed in fire protection system piping shall be exercised annually by conducting a forward flow test at a minimum flow rate of the system demand. Maintenance of all backflow prevention assemblies shall be conducted by a qualified individual following the manufacturer's instructions.

4. **Air Compressors – Inspection – Monthly – {Reference C17H1} –** Air compressors dedicated to water-based fire protection systems shall be inspected monthly to verify the following:
   (1) Air compressor is free of physical damage.
   (2) Power wiring to the air compressor is intact and free of physical damage.
   (3) Piping from the air compressor to the fire protection system is intact and free of physical damage.
   (4) The means of anchoring the air compressor to the structure or to the system piping is secure, tight, and free of physical damage.
   (5) Air compressors requiring oil have the required amount of oil in the oil reservoir.

5. **Air Compressors – Testing – Annually – {Reference C17H2} –** Air compressors dedicated to water-based fire protection systems shall be tested annually to verify the following:
   (1) Air compressor operates as intended on the proper drop of air pressure in the fire protection system.
   (2) Air compressor restores normal air pressure in the fire protection system in the required time frame.
   (3) Air compressor does not overheat while running.

6. **Air Compressors – Maintenance – As Per Manufacturer's Instructions/Annually – {Reference C17H3} –** Air compressors dedicated to water-based fire protection systems shall be maintained in accordance with the manufacturer's instructions. Compressors requiring oil shall have the oil replaced on an annual basis unless the manufacturer's instructions require more frequent replacement.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

WATER BASED FIRE PROTECTION SYSTEMS
FIRE DEPARTMENT CONNECTIONS – INSPECTIONS / TESTING / MAINTENANCE

PA 4151 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of fire department connections.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fire Department Connections – Inspection – Quarterly/Annually – {Reference C17G1} –** Fire department connections shall be inspected quarterly to verify the following:
   (1) Fire department connections are visible and accessible.
   (2) Couplings or swivels are not damaged and rotate smoothly.
   (3) Plugs or caps are in place and undamaged.
   (4) Gaskets are in place.
   (5) Identification signs are in place.
   (6) Check valve is not leaking.
   (7) Automatic drain valve is in place and operating properly.
   (8) Fire department connection clapper(s) is in place and operating properly.
   (9) *Interior of the connection is inspected for obstructions.
   (10) Visible piping supplying the fire department connection is undamaged.

   - Interior inspections shall be conducted annually if approved locking caps or locking plugs are installed.

2. **Fire Department Connections – Standpipe Systems – Testing – 5 Years – {Reference C17G2} –** The piping from the fire department connection to the fire department check valve shall be hydrostatically tested at 150 psi (10 bar) for 2 hours at least once every 5 years.

3. **Fire Department Connections – Sprinkler Systems – Testing – 5 Years – {Reference C17G3} –** The piping from the fire department connection to the fire department check valve shall be hydrostatically tested at 150 psi (10 bar) for 2 hours at least once every 5 years.

S = Satisfactory **U = Unsatisfactory**

FDC ID	Date	Inspector	Task/Result	Notes

CHAPTER 18 – AVIATION FACILITIES

A. Aircraft Hangar Fire Protection Systems

This section provides the requirements for inspection, testing, and maintenance for Fire Protection and Life Safety Systems in Aircraft Hangars only. The frequencies in this section may be different from other Chapters in this Manual and should be not be confused with the requirements for similar fire protection systems and equipment for other applications. Table 11.1.1 from NFPA 409, Standard on Aircraft Hangars, defines the frequencies in this section.

The information provided in this section should not be misconstrued as the only requirements to inspect, test, and maintain fire protection systems in aircraft hangars. Requirements identified throughout this Manual are applicable unless clearly delineated in this section. Specific attention should be paid to Chapters 1 and 6 for sprinkler systems and foam-water sprinkler/foam water spray systems.

The summary of systems, devices, and equipment in aircraft hangars should be captured in the General Information forms included throughout the other chapters in this Manual.

A1. Sprinkler Heads — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1		Visual inspection	
NFPA 25 2017 A.5.2		The provisions of the standard are intended to apply to routine inspections. In the event of a fire, a post-fire inspection should be made of all sprinklers within the fire area. In situations where the fire was quickly controlled or extinguished by one or two sprinklers, it might be necessary only to replace the activated sprinklers. Care should be taken that the replacement sprinklers are of the same make and model or that they have compatible performance characteristics (see 5.4.1.2). Soot covered sprinklers should be replaced because deposits can result in corrosion of operating parts. In the event of a substantial fire, special consideration should be given to replacing the first ring of sprinklers surrounding the operated sprinklers because of the potential for excessive thermal exposure, which could weaken the response mechanisms.	
NFPA 25 2017 5.2.1.1	Annually	Sprinklers shall be inspected from the floor level annually.	PA 4153
NFPA 25 2017 5.2.1.1.1*		Any sprinkler that shows signs of any of the following shall be replaced: (1) Leakage (2) Corrosion detrimental to sprinkler performance (3) Physical damage (4) Loss of fluid in the glass bulb heat-responsive element (5) Loading detrimental to sprinkler performance (6) Paint other than that applied by the sprinkler manufacturer	
NFPA 25 2017 A.5.2.1.1.1		The conditions described in this section can have a detrimental effect on the performance of sprinklers by adversely impacting water distribution patterns, insulating thermal elements delaying operation, or otherwise rendering the sprinkler inoperable or ineffectual. Severely corroded or loaded sprinklers should be reported as a deficiency or impairment as part of the visual inspection and designated to be replaced. Such sprinklers could be affected in their distribution or other performance characteristics not addressed by routine sample testing. Corrosion found on the seat, or built up on the deflector that could affect the spray pattern, or a buildup on the operating elements that could affect the operation can have a detrimental effect on the performance of the sprinkler. Lightly loaded sprinklers or sprinklers having limited corrosion that does not impact the water distribution characteristics can continue to be used if the samples are selected for testing in accordance with 5.3.1 based on worst-case conditions and if the samples successfully pass the tests. Surface discoloration that does not impact the performance of the sprinkler should not warrant replacement or testing. Multiple sprinkler operations within a facility without a fire might be a sign of exposure to excessive temperatures, sprinkler damage, or excessive corrosion of similar sprinklers installed in that facility. Consideration should be given to replacing sprinklers that are considered representative of the operated sprinklers.	

		Glass bulbs in sprinklers exposed to sunlight or installed in cold environments such as walk-in coolers and freezers might lose or change their temperature classification color due to the environment. This loss of color should not be confused with loss of fluid in the glass bulb. Tests have shown that this loss or change of color in the bulb does not affect the operation or any other performance characteristics of the sprinkler, and these sprinklers can be allowed to remain in service. The tests also showed that when sprinklers installed in cold environments were subjected to temperatures above 60°F (15.5°C), the fluid color returned. In lieu of replacing sprinklers that are loaded with a coating of dust, it is permitted to clean sprinklers with compressed air or a vacuum, provided that the equipment does not touch the sprinkler.	
NFPA 25 2017 5.2.1.1.2		Any sprinkler that has been installed in the incorrect orientation shall be corrected by repositioning the branchline, drop, or sprig, or shall be replaced.	
NFPA 25 2017 5.2.1.1.3*		Sprinklers installed in concealed spaces such as above suspended ceilings shall not require inspection.	
NFPA 25 2017 A.5.2.1.1.3		Examples include spaces above ceilings, whether the ceilings are lay-in tile or gypsum board, areas under theater stages, pipe chases, and other inaccessible areas, even if access panels or hatches are provided into the areas. Where temporary listed membrane ceilings are installed, NFPA 13 allows sprinkler protection to be omitted below the “drop out” membrane ceiling. These areas should be inspected during periods when the membrane ceiling is not present.	
NFPA 25 2017 5.2.1.1.4		Sprinklers installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.	
NFPA 25 2017 5.2.1.1.5		Escutcheons and coverplates for recessed, flush, and concealed sprinklers shall be replaced with their listed escutcheon or coverplate if found missing during the inspection.	
NFPA 25 2017 5.2.1.1.5.1		Where the listed escutcheon or coverplate from a listed assembly is missing and is no longer commercially available, the sprinkler shall be replaced.	
NFPA 25 2017 5.2.1.1.6		Escutcheons for pendent sprinklers that are not recessed, flush, or concealed shall not be required to be replaced if found missing during the inspection.	
NFPA 25 2017 5.2.1.2*		The minimum clearance to storage as described in 5.2.1.2.1 through 5.2.1.2.6 shall be maintained below all sprinkler deflectors.	
NFPA 25 2017 A.5.2.1.2		NFPA 13 in the storage definitions defines clearance as the distance from the top of storage to the ceiling sprinkler deflectors. Other obstruction rules are impractical to enforce under this standard. However, if obstructions that might cause a concern are present, the owner is advised to have an engineering evaluation performed.	
NFPA 25 2017 5.2.1.2.1*		Unless greater distances are required by 5.2.1.2.2, 5.2.1.2.3, or 5.2.1.2.4, or lesser distances are permitted by 5.2.1.2.6, learance between the deflector and the top of storage shall be 18 in. (457 mm) or greater.	
NFPA 25 2017 A.5.2.1.2.1		The 18 in. (457 mm) clearance rule generally applies to standard pendent, upright and sidewall spray sprinklers, extended coverage upright and pendent sprinklers, and residential sprinklers.	
NFPA 25 2017 5.2.1.2.2		Where standards other than NFPA 13 specify greater clearance to storage minimums, they shall be followed.	
NFPA 25 2017 5.2.1.2.3*		Clearance between the deflector and the top of storage shall be 36 in. (914 mm) or greater for special sprinklers.	
NFPA 25 2017 A.5.2.1.2.3		The special sprinklers that the minimum 36 in. (915 mm) clearance rule generally applies to includes large drop sprinklers, CMSA sprinklers, and early suppression fast-response (ESFR) sprinklers.	
NFPA 25 2017 5.2.1.2.4		Clearance from the top of storage to sprinkler deflectors shall be 36 in. (914 mm) or greater where rubber tires are stored.	
NFPA 25 2017 5.2.1.2.5		In-rack sprinklers shall not be required to meet the obstruction criteria and clearance from storage requirements.	
NFPA 25 2017 5.2.1.2.6*		Clearance between the deflector and the top of storage shall be permitted to be less than 18 in. (457 mm) where shown to be permitted by the installation standard.	
NFPA 25 2017 A.5.2.1.2.6		The purpose of maintaining a minimum clearance is to ensure water discharge is not obstructed. There are certain installations where this can be achieved by other means. Examples include library stacks, record storage, and where sprinklers are installed in aisles in between storage shelving. Clearance is also not needed for shelving along perimeter walls since this does not cause an obstruction. NFPA 13 allows a clearance less than 18 in. (457 mm) where full-scale fire tests demonstrate an acceptable sprinkler discharge pattern. Also, where sufficient shielding of the sprinkler spray pattern has resulted in an increase in the hazard classification to Extra Hazard Group 2, a clearance less than 18 in. (457 mm) might be acceptable.	
NFPA 25 2017 5.2.1.3*		Storage closer to the sprinkler deflector than permitted by the clearance rules of the installation standard described in 5.2.1.2.1 through 5.2.1.2.4 shall be corrected.	

NFPA 25 2017 A.5.2.1.3		Sprinkler spray patterns should not be obstructed by temporary or nonpermanent obstructions such as signs, banners, or decorations. While it is impractical for an inspector to know all of the various obstruction rules for all the different types of sprinklers, the inspector can observe when temporary or nonpermanent obstructions have been installed that could block or obstruct a sprinkler's spray pattern. Temporary or non-permanent obstructions that appear to be obstructions to sprinkler spray patterns should be removed or repositioned so they are not an obstruction.	
NFPA 25 2017 5.2.1.4	Annually	The supply of spare sprinklers shall be inspected annually for the following: (1) The correct number and type of sprinklers as required by 5.4.1.5 (2) A sprinkler wrench for each type of sprinkler as required by 5.4.1.5.5 (3) The list of spare sprinklers as required by 5.4.1.5.6	PA 4153
NFPA 25 2017 5.4.1.5*		A supply of at least six spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or been damaged in any way can be promptly replaced.	
NFPA 25 2017 A.5.4.1.5		A minimum of two sprinklers of each type and temperature rating installed should be provided.	
NFPA 25 2017 5.4.1.5.3		Where dry sprinklers of different lengths are installed, spare dry sprinklers shall not be required, provided that a means of returning the system to service is furnished.	
NFPA 25 2017 5.4.1.5.4		The stock of spare sprinklers shall include all types and ratings installed and shall be as follows: (1) For protected facilities having under 300 sprinklers — no fewer than 6 sprinklers (2) For protected facilities having 300 to 1000 sprinklers — no fewer than 12 sprinklers (3) For protected facilities having over 1000 sprinklers — no fewer than 24 sprinklers	
NFPA 25 2017 5.4.1.5.5*		One sprinkler wrench as specified by the sprinkler manufacturer shall be provided in the cabinet for each type of sprinkler installed to be used for the removal and installation of sprinklers in the system.	
NFPA 25 2017 A.5.4.1.5.5		One sprinkler wrench design can be appropriate for many types of sprinklers, and multiple wrenches of the same design should not be required.	
NFPA 25 2017 5.4.1.5.6		A list of the sprinklers installed in the property shall be posted in the sprinkler cabinet.	
NFPA 25 2017 5.4.1.5.6.1*		The list shall include the following: (1) Sprinkler identification number (SIN) if equipped; or the manufacturer, model, orifice, deflector type, thermal sensitivity, and pressure rating (2) General description (3) Quantity of each type to be contained in the cabinet (4) Issue or revision date of the list	
NFPA 25 2017 A.5.4.1.5.6.1		The minimum information in the list contained in the spare sprinkler cabinet should be marked with the following: (1) General description of the sprinkler, including upright, pendent, residential, ESFR, and so forth (2) Quantity of sprinklers to be maintained in the spare sprinkler cabinet An example of the list is shown in Figure A.5.4.1.5.6.1.	
NFPA 25 2017 Figure A.5.4.1.5.6.1		**Sprinklers Contained in this Cabinet** Sprinkler Identification, SIN | General Description | Temperature Rating, °F | Sprinkler Quantity Maintained TY9128 | Extended Coverage, K-25, upright | 155 | 6 VK425 | Concealed pendent residential | 145 | 6 Issued: 10/3/05 Revised: **FIGURE A.5.4.1.5.6.1 Sample List. [13:Figure A.6.2.9.7.1]**	
NFPA 25 2017 5.4.1.6*		Sprinklers shall not be altered in any respect or have any type of ornamentation, paint, or coatings applied after shipment from the place of manufacture.	
NFPA 25 2017 A.5.4.1.6		Corrosion-resistant or specially coated sprinklers should be installed in locations where chemicals, moisture, or other corrosive vapors exist.	

A2. Piping / Piping Hangers — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1		Visual inspection	
NFPA 25 2017 5.2.2*	Annually	Sprinkler pipe and fittings shall be inspected annually from the floor level.	PA 4153
NFPA 25 2017 A.5.2.2		The conditions described in 5.2.2 can have a detrimental effect on the performance and life of pipe by affecting corrosion rates or pipe integrity or otherwise rendering the pipe ineffectual.	
NFPA 25 2017 5.2.2.1*		Pipe and fittings shall be free of mechanical damage, leakage, and corrosion.	
NFPA 25 2017 A.5.2.2.1		Surface corrosion not impacting the integrity of the piping strength or raising concern of potential leakage should not warrant the replacement of piping. A degree of judgment should be exercised in the determination of the extent of corrosion that would necessitate replacement.	
NFPA 25 2017 5.2.2.2		Sprinkler piping shall not be subjected to external loads by materials either resting on the pipe or hung from the pipe.	
NFPA 25 2017 5.2.2.3*		Pipe and fittings installed in concealed spaces such as above suspended ceilings shall not require inspection.	
NFPA 25 2017 A.5.2.2.3		Examples include some floor/ceiling or roof/ceiling assemblies, areas under theater stages, pipe chases, and other inaccessible areas.	
NFPA 25 2017 5.2.2.4		Pipe and fittings installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4153
NFPA 25 2017 11.1.2		The 5-year discharge test for piping required in Table 11.1.1 shall not be required if an internal inspection in accordance with NFPA 25 indicates that the pipe is in good condition and free of obstructions, mechanical damage, leakage, and corrosion.	

A3. Sprinkler Valve (Wet Pipe Systems) — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1		Visual inspection.	
NFPA 25 2017 13.4.1.1*	Monthly	Alarm valves and system riser check valves shall be externally inspected quarterly and shall verify the following: (1) The gauges indicate normal supply water pressure is being maintained. (2) The valves and trim are free of physical damage. (3) All valves are in the appropriate open or closed position. (4) The retarding chamber or alarm drains are not leaking.	PA 4154
NFPA 25 2017 A.13.4.1.1		A higher pressure reading on the system gauge is normal in variable pressure water supplies. Pressure over 175 psi (12.1 bar) can be caused by fire pump tests or thermal expansion and should be investigated and corrected.	
NFPA 25 2017 13.4.1.2*	5 Years	Alarm valves and their associated strainers, filters, and restriction orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.	PA 4154
NFPA 25 2017 A.13.4.1.2		The system should be drained for internal inspection of valve components as follows: (1) Close the control valve (2) Open the main drain valve (3) Open the inspector's test valve (4) Wait for the sound of draining water to cease and for all gauges to indicate 0 psi (0 bar) before removing the handhole cover or dismantling any component	
NFPA 409 2016 Table 11.1.1	Quarterly	Operational test with flow, no discharge. [1] Note [1] For the purposes of this test, the inspector's flow valve is acceptable.	PA 4154
NFPA 25 2017 5.3.2.1	Quarterly	Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly.	PA 4154
NFPA 25 2017 5.3.2.2*	Quarterly	Vane-type and pressure switch–type waterflow alarm devices shall be tested semiannually.	PA 4154
NFPA 25 2017 5.3.2.3.1		Where freezing weather conditions or other circumstances prohibit use of the inspector's test connection, the bypass connection shall be permitted to be used.	
NFPA 25 2017 5.3.2.5		Fire pumps shall not be taken out of service during testing unless constantly attended by qualified personnel or all impairment procedures contained in Chapter 15 are followed.	

A4. Sprinkler Valve (Deluge Systems) Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1		Visual inspection.	
NFPA 25 2017 13.4.4.1.3	Monthly	The deluge valve shall be externally inspected monthly to verify the following: (1) The valve is free from physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The valve seat is not leaking. (4) Electrical components are in service.	PA 4155
NFPA 409 2016 Table 11.1.1	Annually	O: Operational test with flow, no discharge.	PA 4155
		Editor's Note: The operational test conducted is a partial trip test with the control valve partially open to initiate flow but not discharge water into the system.	
NFPA 25 2017 A.13.4.5.2.2.3		A partial flow trip test is conducted in the following manner: (1) Fully open the main drain valve to clean any accumulated scale or foreign material from the supply water piping. (2) Close the control valve to the point where additional closure cannot provide flow through the entire area of the drain outlet. (3) Close the valve controlling flow to the device if a quick-opening device is installed. (4) Record the system air or nitrogen pressure and the supply water pressure. (5) Relieve system air or nitrogen pressure by opening the priming level test valve or the inspector's test valve. (6) Note and record the air or nitrogen pressure, and supply water pressure when the dry pipe valve trips. (7) Immediately close the system control valve, and open the main drain valve to minimize the amount of water entering the system piping. (8) Trip test the quick-opening device, if installed, in accordance with the manufacturer's instructions. (9) Open all low point drains, and close them when water ceases to flow. (10) Reset the dry pipe valve and quick-opening device, if installed, in accordance with the manufacturer's instructions, and return the system to service. CAUTION: A partial flow trip test does not provide a high enough rate of flow to latch the clappers of some dry pipe valve models in the open position. When resetting such valves, check that the latching equipment is operative.	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4155
		Editor's Note: The full flow operational test is required at least every 5 years. The operational test with actual discharge follows the same requirements for the deluge valve annual full flow test identified below.	
NFPA 25 2017 A.11.3		Operational tests generally should be comprised of the following: (1) A detection/actuation test with no flow to verify that all components such as automated valves, foam and water pumps, and alarms operate properly (2) A water-only flow test to inspect piping continuity, discharge patterns, pressures, and line flushing (3) A foam flow test to verify solution concentration (4) Resetting of system to its normal standby condition, including draining of lines and filling of foam liquid tank See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 A.13.4.4.2.3		Deluge valves in areas subject to freezing should be trip tested in the spring to allow time before the onset of cold weather for all water that has entered the system or condensation to drain to low points or back to the valve.	
NFPA 25 2017 A.13.4.4.2.3.1		It is necessary that the full flow test incorporate the full functionality of the system, which would include any solenoid valves or other actuation devices. It was a common practice in the past to test the detection system or manual pull station up to the solenoid valve or actuator and to separately test the deluge valve and system after the solenoid valve or actuator. The detectors on the system can be tested separately as long as the functional test includes activation of the actuator or solenoid when it receives an actual or simulated signal.	

NFPA 25 2017 13.4.4.2.4		During the annual full flow test, the water discharge patterns from all of the open spray nozzles or sprinklers shall be observed to ensure that patterns are not impeded by plugged nozzles, that nozzles are correctly positioned, and that obstructions do not prevent discharge patterns from wetting surfaces to be protected.	
NFPA 25 2017 13.4.4.2.4.3		Where misalignment or obstructions occur, the piping and sprinklers or nozzles shall be adjusted and/or cleaned to correct the condition, and the system shall be retested.	
NFPA 25 2017 13.4.4.2.8		Multiple Systems. The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply.	
NFPA 25 2017 13.4.4.2.9	Annually	Manual Operation. Manual actuation devices shall be operated annually.	PA 4155
NFPA 25 2017 13.4.4.2.12*		Records indicating the date the deluge valve was last tripped and the tripping time, as well as the individual and organization conducting the test, shall be maintained at a location or in a manner readily available for review by the authority having jurisdiction.	
NFPA 25 2017 A.13.4.4.2.12		Methods of recording maintenance include tags attached at each riser, records retained at each building, and records retained at one building in a complex.	
NFPA 25 2017 13.4.4.3.3*	Annually and As Needed	Auxiliary drains in deluge systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).	PA 4153
NFPA 25 2017 A.13.4.4.3.3		Suitable facilities should be provided to dispose of drained water. Low points equipped with a single valve should be drained as follows: (1) Open the low-point drain valve slowly. (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve. (3) Repeat this procedure until water ceases to discharge. (4) Replace plug or nipple and cap as necessary. Low points equipped with dual valves should be drained as follows: (1) Close the upper valve. (2) Open the lower valve, and drain the accumulated water. (3) Close the lower valve, open the upper valve, and allow time for additional water accumulation. (4) Repeat this procedure until water ceases to discharge. (5) Replace plug or nipple and cap in lower valve. Removing water from a preaction system is an essential part of a good maintenance program. Failure to keep these systems free of water can result in damage and expensive repairs to both the system and the building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after a system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily, with the frequency of operation decreasing depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry.	

A5. Sprinkler Valve (Preaction Systems) Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1		Visual inspection.	
NFPA 25 2017 13.4.3.1.3	Monthly	The preaction valve shall be externally inspected monthly to verify the following: (1) The valve is free from physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The valve seat is not leaking. (4) Electrical components are in service.	PA 4156
NFPA 409 2016 Table 11.1.1	Annually	Operational test with actual discharge	PA 4156
		Editor's Note: The full flow operational test is required annually. The operational test with actual discharge follows the same requirements for the preaction valve full flow test identified below.	
NFPA 25 2017 13.4.3.2.2		Except for preaction systems covered by 13.4.3.2.4, every 3 years the preaction valve shall be trip tested with the control valve fully open.	
NFPA 25 2017 13.4.3.1.4	Annually	The interior of the preaction valve and the condition of detection devices shall be inspected annually when the trip test is conducted.	PA 4156
NFPA 25 2017 13.4.3.1.4.1	5 Years	Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.	PA 4156

NFPA 25 2017 13.4.3.2.6*	Annually	Manual Operation. Manual actuation devices shall be operated annually.	PA 4156
NFPA 25 2017 13.4.3.2.12	Annually	Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction valve trip test, in accordance with the manufacturer's instructions.	PA 4156
NFPA 25 2017 13.4.3.2.1*	Quarterly	The priming water level in supervised preaction systems shall be tested quarterly for compliance with the manufacturer's instructions.	PA 4156
NFPA 25 2017 A.13.4.3.2.1		High priming water levels can adversely affect the operation of supervisory air. Test the water level as follows: (1) Open the priming level test valve. (2) If water flows, drain it. (3) Close the valve when water stops flowing and air discharges. (4) If air discharges when the valve is opened, the priming water level could be too low. To add priming water, refer to the manufacturer's instructions.	
NFPA 25 2017 13.4.3.2.5	3 Years	Preaction systems shall be tested once every 3 years for air leakage, using one of the following test methods: (1) Perform a pressure test at 40 psi (3.2 bar) for 2 hours. The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test. (2) With the system at normal system pressure, shut off the air source (compressor or shop air) for 4 hours. If the low air pressure alarm goes off within this period, the air leaks shall be addressed.	PA 4156
NFPA 25 2017 13.4.3.3.3*	Annually and As Needed	Auxiliary drains in preaction systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).	PA 4153
NFPA 25 2017 A.13.4.3.3.3		Suitable facilities should be provided to dispose of drained water. Low points equipped with a single valve should be drained as follows: (1) Open the low-point drain valve slowly. (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve. (3) Repeat this procedure until water ceases to discharge. (4) Replace plug or nipple and cap as necessary. Low points equipped with dual valves should be drained as follows: (1) Close the upper valve. (2) Open the lower valve, and drain the accumulated water. (3) Close the lower valve, open the upper valve, and allow time for additional water accumulation. (4) Repeat this procedure until water ceases to discharge. (5) Replace plug or nipple and cap in lower valve. Removing water from a deluge system is an essential part of a good maintenance program. Failure to keep these systems free of water can result in damage and expensive repairs to both the system and the building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after a system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals, depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily, with the frequency of operation decreasing depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry.	

A6. Sprinkler Valve (Dry Pipe Systems) Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1		Visual inspection	
NFPA 25 2017 13.4.5.1.3	Monthly	The dry pipe valve shall be externally inspected monthly to verify the following: (1) The valve is free of physical damage. (2) All trim valves are in the appropriate open or closed position. (3) The intermediate chamber is not leaking.	PA 4157

NFPA 25 2017 13.4.5.1.4	Annually	The interior of the dry pipe valve shall be inspected annually when the trip test is conducted.	PA 4157
NFPA 409 2016 Table 11.1.1	Annually	Operational test with actual discharge	PA 4157
		The full flow operational test is required annually. The operational test with actual discharge follows the same requirements for the dry pipe valve full flow test identified below.	
NFPA 25 2017 13.4.5.2.2*		Each dry pipe valve shall be trip tested annually during warm weather.	
NFPA 25 2017 A.13.4.5.2.2		Dry pipe valves should be trip tested in the spring to allow time before the onset of cold weather for all water that has entered the system or condensation to drain to low points or back to the valve. See the NFPA 25 handbook, Water-Based Fire Protection Systems Handbook, for additional guidance relative to potential procedures for the conduct of such testing.	
NFPA 25 2017 13.4.5.2.2.4		When refilling a dry system, the air supply shall be capable of restoring normal air pressure in the system within 30 minutes.	
NFPA 25 2017 13.4.5.2.5		A tag or card that shows the date on which the dry pipe valve was last tripped, and the name of the person and organization conducting the test, shall be attached to the valve.	
NFPA 25 2017 13.4.5.2.5.1		Separate records of initial air and water pressure, tripping air pressure, and dry pipe valve operating conditions shall be maintained on the premises for comparison with previous test results.	
NFPA 25 2017 13.4.5.2.5.2		Records of dry pipe valve tripping time and water transit delivery time to the inspector's test connection shall be maintained for full flow trip tests.	
NFPA 25 2017 13.4.5.2.6*	Annually	Low air pressure alarms, if provided, shall be tested annually in accordance with the manufacturer's instructions.	PA 4157
NFPA 25 2017 13.4.5.2.8	Annually	Automatic air pressure maintenance devices, if provided, shall be tested annually during the dry pipe valve trip test in accordance with the manufacturer's instructions.	PA 4157
NFPA 25 2017 13.4.5.3.2*	Annually and After Each Operation	Auxiliary drains in dry pipe sprinkler systems shall be drained after each operation of the system, before the onset of freezing weather conditions, and thereafter as needed.	PA 4157
NFPA 25 2017 A.13.4.5.3.2		Removing water from a dry system is an essential part of a good maintenance program. Failure to keep the dry system free of water can result in damage and expensive repairs to both the system and building. A program for monitoring the condition of the system and the operation of the auxiliary drains should be instituted. Auxiliary drains should be operated on a daily basis after a dry sprinkler system operation until several days pass with no discharge of water from the drain valve. Thereafter, it might be possible to decrease the frequency to weekly or longer intervals depending on the volume of water discharged. Likewise, when preparing for cold weather, the auxiliary drains should be operated daily with the frequency of operation decreasing depending on the discharge of accumulated water. In many cases, the frequency of the operation can decrease significantly if a system is shown to be dry. A quick-opening device, if installed, should be removed temporarily from service prior to draining low points.	
NFPA 25 2017 13.4.5.2.1*	Quarterly	The priming water level shall be tested quarterly.	PA 4157
NFPA 25 2017 A.13.4.5.2.1		High priming water levels can affect the operation of supervisory air or nitrogen pressure maintenance devices. Test the water level as follows: (1) Open the priming level test valve. (2) If water flows, drain it. (3) Close the valve when water stops flowing and air discharges. (4) If air discharges when the valve is opened, the priming water level could be too low. To add priming water, refer to the manufacturer's instructions.	
NFPA 25 2017 13.4.5.2.4*	Quarterly	Quick-opening devices, if provided, shall be tested quarterly.	PA 4157
NFPA 25 2017 A.13.4.5.2.4		Except when a full flow trip test is conducted in accordance with A.13.4.5.2.2.2, a quick-opening device should be tested in the following manner: (1) Close the system control valve (2) Open the main drain valve, and keep it in the open position (3) Verify that the quick-opening device control valve is open (4) Open the inspector's test valve. (Note that a burst of air from the device indicates that it has tripped) (5) Close the device's control valve (6) Return the device to service in accordance with the manufacturer's instructions and return the system to service	
NFPA 25 2017 13.4.5.2.9*	3 Years	Dry pipe systems shall be tested once every 3 years for gas leakage, using one of the following test methods: (1) A gas (air or nitrogen) pressure test at 40 psi (3.2 bar) shall be performed for 2 hours. (a) The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the	PA 4157

		test. (b) Gas leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test. (2) With the system at normal system pressure, the gas source (nitrogen supply, compressor, or shop air) shall be shut off for 4 hours. If the low pressure alarm goes off within this period, the leaks shall be addressed.	

A7. Shutoff Valves — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
		Editor's Note: Reference to shutoff valves refers to individual manual shutoff valves such as for monitor nozzles or double check valve assemblies. Shutoff valves shall not be confused with control valves for sprinkler/standpipe systems. Conditions identified below are requirements for control valves and not specifically applicable for shutoff valves. Information is provided as a general guide for valve inspection.	
NFPA 25 2017 13.3.2.2*	Monthly	The valve inspection shall verify that the valves are in the following condition: (1) In the normal open or closed position (2) * Sealed, locked, or supervised (3) Accessible (4) Post indicator valves (PIVs) are provided with correct wrenches (5) Free from external leaks (6) Provided with applicable identification	PA 4164

A8. Shutoff Valves — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Annually	Functional test, no flow.	PA 4164
		Information provided below are requirements for control valves and not specifically applicable for shutoff valves. Information is provided as a general guide for testing and maintenance of valves in fire protection systems.	
NFPA 25 2017 13.3.3.1	Annually	Each control valve shall be operated annually through its full range and returned to its normal position.	PA 4164
NFPA 25 2017 13.3.4.1	Annually	The operating stems of outside screw and yoke valves shall be lubricated annually.	PA 4164
NFPA 25 2017 13.3.4.2		The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.	

A9. Fire Pumps — No Flow Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Weekly	Functional test, no flow. [2] Note [2] Churn test.	PA 4162 PA 4163
NFPA 25 2017 A.8.3		The purpose of testing the pump assembly is to ensure automatic or manual operation upon demand and continuous delivery of the required system output. An additional purpose is to detect deficiencies of the pump assembly not evident by inspection.	
NFPA 25 2017 8.3.1.1*	Weekly	A no-flow test shall be conducted for diesel engine–driven fire pumps on a test frequency in accordance with 8.3.1.1.1 or 8.3.1.1.2.	PA 4163
NFPA 25 2017 A.8.3.1.1		Fire pump systems conforming to the 1999 and more recent editions of NFPA 20 should be designed so that the pressure relief valve has a minimum flow (to verify pressure relief valve is properly set and operating) at churn and only allows a larger flow under abnormal conditions (i.e., engine overspeed or failure of a variable speed pressure limiting control). In situations where the discharge from the relief valve is piped back to the pump suction, the fire pump imparts more energy into the water when recirculating the water through the pump than when the pump is operating at churn (no flow). Since the 1999 edition of NFPA 20 a circulation relief valve has been required downstream of the pressure relief valve whenever the pressure relief valve is piped back to the pump suction. Improperly installed and/or operating circulation relief valves can result in unacceptably high water temperature, especially when recirculating the water to the pump	

		suction. High water temperatures can affect the operation of a diesel engine drive. Modern engines, due to EPA requirements, are more sensitive to cooling water temperatures. For fire pump systems conforming to editions of NFPA 20 prior to 1999 that were installed with a pressure relief valve piped back to suction without a circulation relief valve installed downstream of the pressure relief valve, installation of a circulation relief valve is needed. The test can be conducted without a circulation relief valve by taking suction and discharge pressure gauge readings quickly while there is no flow into the fire protection system, then creating a small flow by opening an inspector's test connection, alarm bypass or main drain downstream of the pump to prevent the pump from overheating during the rest of the test. However, if the first pump starts while it is unattended without water flowing into the fire protection system, it is likely to be damaged.	
NFPA 25 2017 8.3.1.2*	Weekly	A no-flow test shall be conducted for electric motor–driven fire pumps on a test frequency in accordance with 8.3.1.2.1, 8.3.1.2.2, 8.3.1.2.3, or 8.3.1.2.4.	PA 4162
NFPA 25 2017 A.8.3.1.2		For pressure relief valve operation, see 8.3.1.1.	
NFPA 25 2017 8.3.2.1.1		Except as permitted in 8.3.2.1.2 and 8.3.2.1.3, a main pressure relief valve (where installed) shall be permitted to weep but not discharge a significant quantity of water.	
NFPA 25 2017 8.3.2.1.1.1		Except as required in 8.3.2.1.1.2, the circulation relief valve shall discharge a small flow of water.	
NFPA 25 2017 8.3.2.1.1.2		The circulation relief valve shall not operate when the flow through the main pressure relief valve is greater than weeping.	
NFPA 25 2017 8.3.2.1.2		For fire pump installations that were installed under a standard (1993 and earlier editions of NFPA 20) that did not prohibit a design that required operation of a pressure relief valve to keep the discharge pressure below the rating of the system components, the pressure relief valve shall be permitted to operate as designed during a no-flow test.	
NFPA 25 2017 8.3.2.1.2.1*		The pressure readings on the discharge and suction gauges shall be recorded, and a pressure difference that is greater than 95 percent of the rated pump pressure shall be investigated and corrected.	
NFPA 25 2017 A.8.3.2.1.2.1		An excessive pressure differential might indicate that the pressure relief valve is wide open and not properly regulating the pressure. Excessively high flow rates through the pressure relief valve can cause failure of the fire protection system and can overload a diesel engine drive and result in destruction of the engine.	
NFPA 25 2017 8.3.2.1.2.2*		The discharge temperature of the water shall be monitored and the pump shut down if necessary to prevent exposing the pump and/or driver to excessive temperatures.	
NFPA 25 2017 A.8.3.2.1.2.2		High water temperatures can cause diesel engines to overheat and fail.	
NFPA 25 2017 8.3.2.1.3		For positive displacement pumps, the pressure relief valve shall operate during a no-flow test.	
NFPA 25 2017 8.3.2.1.3.1		Where the pressure relief valve is piped back to suction, the pump circulation relief valve shall not operate.	
NFPA 25 2017 8.3.2.1.3.2		On electric motor and radiator cooled engine drives, a circulation pressure relief valve located downstream of the main pressure relief valve shall discharge sufficient water to prevent overheating of the pump.	
NFPA 25 2017 8.3.2.2		The test shall be conducted by starting the pump automatically.	
NFPA 25 2017 8.3.2.3		The electric pump shall run a minimum of 10 minutes.	
NFPA 25 2017 8.3.2.4		The diesel pump shall run a minimum of 30 minutes.	
NFPA 25 2017 8.3.2.5		A valve installed to open as a safety feature shall be permitted to discharge water.	
NFPA 25 2017 8.3.2.6		An automatic timer that meets 8.3.2.6.1 through 8.3.2.6.3 shall be permitted to be substituted for the starting procedure.	
NFPA 25 2017 8.3.2.6.1		A solenoid valve drain on the pressure control line shall be the initiating means for a pressure-actuated controller.	
NFPA 25 2017 8.3.2.6.2		In a pressure-actuated controller, performance of this program timer shall be recorded as a pressure drop indication on the pressure recorder.	
NFPA 25 2017 8.3.2.6.3		In a non-pressure-actuated controller, the test shall be permitted to be initiated by means other than a solenoid valve.	
NFPA 25 2017 8.3.2.7		Qualified personnel shall be in attendance whenever the pump is in operation.	
NFPA 25 2017 8.3.2.7.1*		The use of the automatic timer allowed in 8.3.2.6 shall not eliminate the requirement of 8.3.2.7 to have qualified personnel present during the test.	
NFPA 25 2017 A.8.3.2.7.1		An automatic timer allows a person who has been instructed on what to watch for and record during this test to monitor the test and request assistance should any issues arise.	

NFPA 25 2017 8.3.2.8		The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is idle: (1) Record the system suction and discharge pressure gauge readings. (2) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log where such information is available without having to open an energized electric motor–driven fire pump controller. (3) If the highest or lowest pressure is outside of the expected range, record all information from the event log that helps identify the abnormality.	
NFPA 25 2017 8.3.2.9*		The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running: (1) Pump system procedure is as follows: (a) Record the pump starting pressure from the pressure switch or pressure transducer. (b) Record the system suction and discharge pressure gauge readings. (c) Inspect the pump packing glands for slight discharge. (d) Adjust gland nuts if necessary. (e) Inspect for unusual noise or vibration. (f) Inspect packing boxes, bearings, or pump casing for overheating. (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge. (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log. (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water. (2) Electrical system procedure is as follows: (a) Observe the time for motor to accelerate to full speed. (b) Record the time controller is on first step (for reduced voltage or reduced current starting). (c) Record the time pump runs after starting (for automatic stop controllers). (3) Diesel engine system procedure is as follows: (a) Observe the time for engine to crank. (b) Observe the time for engine to reach running speed. (c) Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running. (d) Record any abnormalities. (e) Inspect the heat exchanger for cooling waterflow.	
NFPA 25 2017 A.8.3.2.9		See Table A.8.3.2.9.	
NFPA 25 2017 Table A.8.3.2.9		**Δ Table A.8.3.2.9 Observations — While Pumping** **Item** / **While Pump Is Operating** Horizontal pumps: 1. Read suction and discharge gauges — difference between these readings indicates churn pressure, which should match churn pressure as shown on fire pump nameplate. 2. Observe packing glands for proper leakage for cooling of packing. 3. Observe discharge from casing relief valve — adequate flow keeps pump case from overheating. Vertical pumps: 1. Read discharge gauge — add distance to water level in feet (or meters) and divide by 2.31 to compute psi (30.47 to compute bar). This total must match churn pressure as shown on fire pump nameplate. 2. Observe packing glands for proper leakage for cooling of packing. 3. Observe discharge from casing relief valve — adequate flow keeps pump case from overheating. Diesel engines: 1. Observe discharge of cooling water from heat exchanger — if not adequate, inspect strainer in cooling system for obstructions. If still not adequate, adjust pressure-reducing valve for correct flow. 2. Inspect engine instrument panel for correct speed, oil pressure, water temperature, and ammeter charging rate. 3. Inspect battery terminal connections for corrosion and clean if necessary. 4. After pump has stopped running, inspect intake screens, if provided; replace diesel system pressure recorder chart; and rewind if necessary.	

A10. Fire Pumps — Flow Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Annually	Operational test with actual discharge.	PA 4169 PA 4170
NFPA 25 2017 8.3.3.1*	Annually	An annual test of each pump assembly shall be conducted by qualified personnel under no-flow (churn), rated flow, and 150 percent of the pump rated capacity flow of the fire pump by controlling the quantity of water discharged through approved test devices.	PA 4169 PA 4170
NFPA 25 2017 A.8.3.3.1		Minimum flow for a pump is the churn pressure.	
NFPA 25 2017 8.3.3.1.1		If available suction supplies do not allow flowing of 150 percent of the rated pump capacity, the fire pump shall be tested to the maximum allowable discharge.	
NFPA 25 2017 8.3.3.6.1		Use of Pump Discharge via Hose Streams.	
NFPA 25 2017 8.3.3.6.1.1		Pump suction and discharge pressures and the flow measurements of each hose stream shall determine the total pump output.	
NFPA 25 2017 8.3.3.6.1.2*		Care shall be taken to minimize any water damage caused by the high volume of water discharging during the test.	
NFPA 25 2017 A.8.3.3.6.1.2		Whether using a play pipe, water diffuser, or other discharge device, damage can be caused by the water stream, or can be caused by inadequate drainage in the area of the discharge.	
NFPA 25 2017 8.3.3.6.2		Use of Pump Discharge via Bypass Flowmeter to Drain or Suction Reservoir. Pump suction and discharge pressures and the flowmeter measurements shall determine the total pump output.	
NFPA 25 2017 8.3.3.6.3		Use of Pump Discharge via Bypass Flowmeter to Pump Suction (Closed-Loop Metering).	
NFPA 25 2017 8.3.3.6.3.1		Pump suction and discharge pressures and the flowmeter measurements shall determine the total pump output.	
NFPA 25 2017 8.3.3.6.3.2		When testing includes recirculating water back to the fire pump suction, the temperature of the recirculating water shall be monitored to verify that it remains below temperatures that could result in equipment damage as defined by the pump and engine manufacturers.	
NFPA 25 2017 8.3.3.6.3.3		If the test results are not consistent with the previous annual test, the test shall be repeated using the test arrangement described in 8.3.3.6.1.	
NFPA 25 2017 8.3.3.6.3.4		If testing in accordance with 8.3.3.6.1 is not possible, a flowmeter calibration shall be performed and the test shall be repeated.	
NFPA 25 2017 8.3.3.7		The pertinent visual observations, measurements, and adjustments specified in the following checklists shall be conducted annually while the pump is running and flowing water under the specified output condition: (1) At no-flow condition (churn), the procedure is as follows: (a) Inspect the circulation relief valve for operation to discharge water. (b) Inspect the pressure relief valve (if installed) for proper operation. (2) At each flow condition, the procedure is as follows: (a) Where an external means is provided on the controller, record the electric motor voltage and current (all lines). (b) Record the pump speed in rpm. (c) Record the simultaneous (approximately) readings of pump suction and discharge pressures and pump discharge flow. (3) * For electric motor–driven pumps, do not shut down the pump until it has run for 10 minutes. (4) For diesel motor–driven pumps, do not shut down the pump until it has run for 30 minutes.	
NFPA 25 2017 A.8.3.3.7(3)		It is not the intent to discharge water for the full 1-hour test duration, provided all flow tests can be conducted in less time and efforts are taken to prevent the pump from overheating.	
NFPA 25 2017 8.3.3.8*		For installations having a pressure relief valve, the operation of the relief valve shall be closely observed during each flow condition to determine whether the pump discharge pressure exceeds the normal operating pressure of the system components.	

NFPA 25 2017 A.8.3.3.8		A pressure relief valve that opens during a flow condition is discharging water that is not measured by the recording device(s). It can be necessary to temporarily close the pressure relief valve to achieve favorable pump test results. At the conclusion of the pump test, the pressure relief valve must be readjusted to relieve pressures in excess of the normal operating pressure of the system components. If the pressure relief valve is open during the flowing conditions due to the fact that the pressure is too high for the components in the fire protection system, the discharge control valve should be closed prior to closing the pressure relief valve to make sure that the fire protection system is not overpressurized. After the test, the valve must be opened again.	
NFPA 25 2017 8.3.3.8.1*		The pressure relief valve shall also be observed during each flow condition to determine whether the pressure relief valve closes at the proper pressure.	
NFPA 25 2017 A.8.3.3.8.1		A pressure relief valve that is open during a flow condition will affect test results.	
NFPA 25 2017 8.3.3.8.2		The pressure relief valve shall be closed during flow conditions if necessary to achieve minimum rated characteristics for the pump and reset to normal position at the conclusion of the pump test.	
NFPA 25 2017 8.3.3.8.2.1		When it is necessary to close the relief valve to achieve minimum rated characteristics for the pump, the pump discharge control valve shall be closed if the pump churn pressure exceeds the system rated pressure.	
NFPA 25 2017 8.3.3.8.3		When pressure relief valves are piped back to the fire pump suction, the temperature of the recirculating water shall be monitored to verify that it remains below temperatures that could result in equipment damage as defined by the pump and engine manufacturers.	
NFPA 25 2017 8.3.3.9		For installations having an automatic transfer switch, the following test shall be performed to ensure that the overcurrent protective devices (i.e., fuses or circuit breakers) do not open: (1) Simulate a power failure condition while the pump is operating at peak load. (2) Verify that the transfer switch transfers power to the alternate power source. (3) While the pump is operating at peak load and alternate power, record the following to include in the pump test results: (a) The voltage where an external means is provided on the controller (a) The amperage where an external means is provided on the controller (b) The rpm (c) Suction pressure (d) Discharge pressure (5) Verify that the pump continues to perform at peak horsepower load on the alternate power source for a minimum of 2 minutes. (6) Remove the power failure condition and verify that, after a time delay, the pump is reconnected to the normal power source.	
NFPA 25 2017 8.3.3.10*		Alarm conditions shall be simulated by activating alarm circuits at alarm sensor locations, and all such local or remote alarm indicating devices (visual and audible) shall be observed for operation.	
NFPA 25 2017 A.8.3.3.10		It is not the intent to verify that all the alarm conditions required by NFPA 20 (e.g., low oil pressure, high coolant temperature, failure of engine to start, engine overspeed) transmit individually to a remote location, as long as these alarms, where provided, can be individually verified at the fire pump controller.	
NFPA 25 2017 8.3.3.10.1*		Alarm sensors located within electric motor–driven fire pump controllers that cannot be accessed without opening an energized electric motor–driven fire pump controller shall be tested at an alternative location outside of the controller.	
NFPA 25 2017 A.8.3.3.10.1		Testing at an alternative location can include completion of a test at an external fire alarm monitor module used to monitor the sensors within the fire pump controller.	

A11. Water Reservoirs — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4165
NFPA 25 2017 9.2.1		Water Level.	
NFPA 25 2017 9.2.1.1*	Monthly	The water level in tanks equipped with supervised water level alarms that are supervised in accordance with NFPA 72 shall be inspected quarterly.	PA 4165

NFPA 25 2017 A.9.2.1.1		More frequent inspections should be made where extreme conditions, such as freezing temperatures or arid climate, can increase the probability of adversely affecting the stored water. Supervisory water level alarms installed on tanks provide notification that the tank water level is above or below an acceptable level. The water level of the tank is the main concern as opposed to the condition of the water. For convenience, inspection of the condition of the water can take place concurrently with the water level inspection.	
NFPA 25 2017 9.4.2		The tank shall be maintained full or at the designed water level.	
NFPA 25 2017 9.2.2		Heating System.	
NFPA 25 2017 9.2.2.1	Monthly	Tank heating systems installed on tanks equipped with low water temperature alarms supervised in accordance with NFPA 72 , connected to a constantly attended location shall be inspected quarterly during the heating season.	PA 4165
NFPA 25 2017 9.2.2.2	Daily	Tank heating systems without a supervised low temperature alarm connected to a constantly attended location shall be inspected daily during the heating season.	PA 4165
NFPA 25 2017 9.2.3		Water Temperature.	
NFPA 25 2017 9.2.3.1		The temperature of water in tanks shall not be less than 40°F (4.0°C).	
NFPA 25 2017 9.2.3.2	Monthly	The temperature of water in tanks with low temperature alarms supervised in accordance with NFPA 72, connected to a constantly attended location shall be inspected and recorded quarterly during the heating season when the mean temperature is less than 40°F (4.0°C).	PA 4165
NFPA 25 2017 9.2.3.3	Weekly	The temperature of water in tanks without low temperature alarms connected to a constantly attended location shall be inspected and recorded weekly during the heating season when the mean temperature is less than 40°F (4.0°C).	PA 4165
NFPA 25 2017 9.2.4		Exterior Inspection.	
NFPA 25 2017 9.2.4.1*	Monthly	The exterior of the tank, supporting structure, vents, foundation, and catwalks or ladders, where provided, shall be inspected quarterly for signs of obvious damage or weakening.	PA 4165
NFPA 25 2017 A.9.2.4.1		Lightning protection systems, where provided, should be inspected, tested, and maintained in accordance with NFPA 780.	
NFPA 25 2017 9.2.4.2	Monthly	The area surrounding the tank and supporting structure, where provided, shall be inspected quarterly to ensure that the following conditions are met: (1) The area is free of combustible storage, trash, debris, brush, or material that could present a fire exposure hazard. (2) The area is free of the accumulation of material on or near parts that could result in accelerated corrosion or rot. (3) The tank and support are free of ice buildup. (4) The exterior sides and top of embankments supporting coated fabric tanks are free of erosion.	PA 4165
NFPA 25 2017 9.2.4.3	Monthly	Expansion joints, where provided, shall be inspected annually for leaks and cracks.	PA 4165
NFPA 25 2017 9.2.4.4	Monthly	The hoops and grillage of wooden tanks shall be inspected annually.	PA 4165
NFPA 25 2017 9.2.4.5	Monthly	Exterior painted, coated, or insulated surfaces of the tank and supporting structure, where provided, shall be inspected annually for signs of degradation.	PA 4165

A12. Hose Stations — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4160
		Editor's Note — Table 11.1.1 in NFPA 409 identifies requirements for hose stations focusing on the foam system hand hose stations required by this standard. The inspection details identified below are a combination of standpipe system requirements.	

NFPA 25 2017 6.2.3.1	Monthly	Hose connections shall be inspected annually for the following conditions: (1) Valve cap(s) missing or damaged (2) Fire hose connection damaged (3) Valve handles missing or damaged (4) Cap gaskets missing or deteriorated (5) Valve leaking (6) Visible and physical obstructions to hose connections (7) Pressure restricting device missing (8) Manual, semiautomatic, or dry standpipe valve does not operate smoothly (9) Valve threads damaged	PA 4160
NFPA 25 2017 6.2.3.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	
NFPA 25 2017 6.2.7.1	Monthly	Hose storage devices shall be inspected annually for the following conditions: (1) Difficult to operate (2) Damaged (3) Visible or physical obstruction (4) Hose improperly racked or rolled (5) Nozzle clip not in place and nozzle not correctly contained (6) Hose rack enclosed in cabinet not swinging out at least 90 degrees	PA 4160
NFPA 25 2017 6.2.7.2		Where any deficiency is noted, the appropriate corrective action shall be taken.	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4160
		Editor's Note: An operational test with actual discharge is required for all hose stations and may be conducted in conjunction with full discharge test of the system.	

A13. Strainer Filter Baskets — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Annually	Visual inspection.	PA 4167
NFPA 25 2017 11.2.6.1	Annually	Mainline and individual discharge device strainers (basket or screen) shall be inspected every 5 years for damaged and corroded parts.	PA 4167
NFPA 25 2017 11.2.6.3		Discharge device strainers shall be removed, inspected, and cleaned during the flushing procedure for the mainline strainer.	
NFPA 25 2017 11.2.6.4		Foam concentrate strainers shall be inspected visually to ensure the blowdown valve is closed and plugged.	
NFPA 25 2017 11.2.6.5	After Each Operation or Flow Test	Baskets or screens shall be removed and inspected after each operation or flow test.	PA 4167

A14. Foam Concentrate — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Annually	Functional test, no flow.	PA 4167
NFPA 25 2017 11.2.9		Foam Concentrate Samples. Samples shall be submitted in accordance with the manufacturer's recommended sampling procedures.	

A15. Concentrate Storage Tanks — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4167
NFPA 25 2017 11.2.8.4*		Inspection of the concentrate tank shall include verification that the quantity of foam concentrate satisfies the requirements of the original design.	

NFPA 25 2017 A.11.2.8.4		In some cases, an adequate supply of foam liquid is available without a full tank. This is particularly true of foam liquid stored in nonmetallic tanks. If liquid is stored in metallic tanks, the proper liquid level should be one-half the distance into the expansion dome.	

A16. Concentrate Pump — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Weekly	Functional test, no flow. [2] Note [2] Churn test.	PA 4167
NFPA 409 2016 Table 11.1.1	Annually	Operational test with flow, no discharge.	PA 4167
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4167

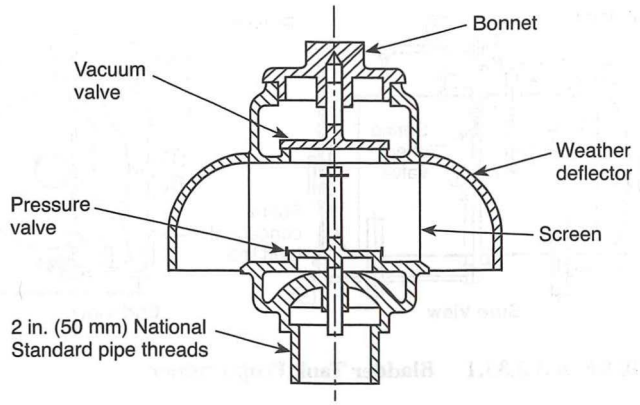
A17. Concentrate Control Valve (Automatic) — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4164
NFPA 25 2017 11.2.8.2		Valves specified to be inspected shall be permitted to be open or closed, depending on specific functions within each foam-water sprinkler system.	
NFPA 25 2017 11.2.8.3		The position (open or closed) of valves shall be verified in accordance with specified operating conditions.	
NFPA 409 2016 Table 11.1.1	Annually	Operational test with flow, no discharge.	PA 4164
		Editor's Note: An operational test with flow but not discharging into the system is conducted where the automatic concentrate control valve is operated through its full range and returned to its normal position.	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge	PA 4164
		Editor's Note The operational test with actual discharge conducted is in conjunction with full discharge test of the system.	

A18. Concentrate Control Valve — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4164
NFPA 25 2017 11.2.8.2		Valves specified to be inspected shall be permitted to be open or closed, depending on specific functions within each foam-water sprinkler system.	
NFPA 25 2017 11.2.8.3		The position (open or closed) of valves shall be verified in accordance with specified operating conditions.	
NFPA 409 2016 Table 11.1.1	Annually	Functional test, no flow.	PA 4164
		Editor's Note: A functional test without discharge into the system is conducted where the concentrate shutoff valve is operated through its full range and returned to its normal position.	

A19. Foam Proportioning Device — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4168
NFPA 25 2017 11.2.8.5.1		Standard Pressure Proportioner.	
NFPA 25 2017 11.2.8.5.1.1*		The pressure shall be removed before the inspection to prevent injury.	
NFPA 25 2017 A.11.2.8.5.1.1		The standard pressure proportioner is a pressure vessel. Although under normal standby conditions this type of proportioning system should not be pressurized, some installations allow for inadvertent pressurization. Pressure should be removed before inspection.	
NFPA 25 2017 11.2.8.5.1.2		The inspection shall verify the following: (1) Ball drip valves (automatic drains) are free and opened. (2) External corrosion on foam concentrate storage tanks is not present.	
NFPA 25 2017 11.2.8.5.2		Bladder Tank Proportioner.	
NFPA 25 2017 11.2.8.5.2.1*		The pressure shall be removed before the inspection to prevent injury.	
NFPA 25 2017 A.11.2.8.5.2.1		The bladder tank proportioner is a pressure vessel. Where inspecting for a full liquid tank, the manufacturer's instructions should be followed. If inspected incorrectly, the tank sight gauges could indicate a full tank when the tank actually is empty of foam liquid. Some foam liquids, due to their viscosity, might not indicate true levels of foam liquid in the tank where inspected via the sight glass. CAUTION: Depending on system configuration, this type of proportioner system might be pressurized or nonpressurized under normal conditions. Pressure should be removed before inspection.	
NFPA 25 2017 11.2.8.5.2.2		The inspection shall include the following: (1) Water control valves to foam concentrate tank (2) An inspection for external corrosion on foam concentrate storage tanks (3) An inspection for the presence of foam in the water surrounding the bladder (annual)	
NFPA 25 2017 11.2.8.5.3		Line Proportioner. The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) An inspection for external corrosion on foam concentrate storage tanks	
NFPA 25 2017 A.11.2.8.5.3(1)		See 11.2.6.1.	
NFPA 25 2017 11.2.6.1		Mainline and individual discharge device strainers (basket or screen) shall be inspected every 5 years for damaged and corroded parts.	
NFPA 25 2017 A.11.2.8.5.3(2)		See Figure A.3.3.32	
NFPA 25 2017 Figure A.3.3.32		 FIGURE A.3.3.32 Pressure Vacuum Vent.	

NFPA 25 2017 11.2.8.5.4		Standard Balanced Pressure Proportioner. The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) Verification that gauges are in good operating condition (4) Verification that sensing line valves are open (5) Verification that power is available to foam liquid pump	
NFPA 25 2017 A.11.2.8.5.4(1)		See 11.2.6.1.	
NFPA 25 2017 A.11.2.8.5.4(2)		See Figure A.3.3.32	
NFPA 25 2017 11.2.8.5.5		In-Line Balanced Pressure Proportioner. The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) Verification that gauges are in good working condition (4) Verification that sensing line valves at pump unit and individual proportioner stations are open (5) Verification that power is available to foam liquid pump	
NFPA 25 2017 A.11.2.8.5.5(1)		See 11.2.6.1.	
NFPA 25 2017 A.11.2.8.5.5(2)		See Figure A.3.3.32	
NFPA 25 2017 11.2.8.5.6		Orifice Plate Proportioner. The inspection shall include the following: (1) * Strainers (2) * Verification that pressure vacuum vent is operating freely (3) Verification that gauges are in good working condition (4) Verification that power is available to foam liquid pump	
NFPA 25 2017 A.11.2.8.5.6(1)		See 11.2.6.1.	
NFPA 25 2017 A.11.2.8.5.6(2)		See Figure A.3.3.32	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge	PA 4168
		Editor's Note: The operational test with actual discharge conducted is in conjunction with full discharge test of the system.	

A20. Water Powered Monitor Nozzle — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4166
		Editor's Note: Visual inspection is a physical survey of the space or device and surroundings in order to identify any impairment that may have a detrimental effect on performance.	
NFPA 409 2016 Table 11.1.1	Annually	Operational test with actual discharge.	PA 4166
		Editor's Note: The operational test with actual discharge demonstrates the full motion of the nozzle. Discharge of foam solution is not required.	

A21. Electric Powered Monitor Nozzle — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4166
		Editor's Note: Visual inspection is a physical survey of the space or device and surroundings in order to identify any impairment that may have a detrimental effect on performance.	
NFPA 409 2016 Table 11.1.1	Annually	Functional test, no flow.	PA 4166
		Editor's Note: The functional test without discharge conducted demonstrates the full motion of the nozzle. Discharge of foam solution is not required.	

NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4166
		Editor's Note: The operational test with actual discharge required can be done in conjunction with full discharge test of the system.	

A22. Water Powered High Expansion Foam Generator — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4160
NFPA 409 2016 Table 11.1.1	Annually	D: Operational test with actual discharge.	PA 4160
		Editor's Note: This test is intended to be an operational test with water only. This test is to be conducted from each foam generator.	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4160
		Editor's Note: This test is intended to be an operational test with foam from each foam generator.	

A23. Electric Powered High Expansion Foam Generator — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4160
NFPA 409 2016 Table 11.1.1	Annually	Functional test, no flow.	PA 4160
		Editor's Note: This test is intended to be an operational test with water only. This test is to be conducted from each foam generator.	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4160
		Editor's Note: This test is intended to be an operational test with foam from each foam generator.	

A24. Pneumatic Detector — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4159
		Editor's Note: A test demonstrating satisfactory pneumatic detector system operation is required.	
NFPA 409 2016 Table 11.1.1	Annually	Operational test with flow, no discharge. [3] Note [3]: At this time it is necessary to check that the set points are the same as the original.	PA 4159
		Editor's Note: A satisfactory test of the pneumatic detector system is required demonstrating operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system. This test can be conducted in conjunction with the annual test required in B.9 above.	

A25. Electric Detector — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4159
		Editor's Note A test demonstrating satisfactory electric detector system operation is required.	
NFPA 409 2016 Table 11.1.1	Annually	Operational test with flow, no discharge. [3] Note [3]: At this time it is necessary to check that the set points are the same as the original.	PA 4159
		Editor's Note: A satisfactory test of the electric detector system is required demonstrating operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system. This test can be conducted in conjunction with the annual test required in B.9 above.	

A26. Optical Detector — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Weekly	Visual inspection.	PA 4159
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4159
		Editor's Note A test demonstrating satisfactory optical detector system operation is required.	
NFPA 409 2016 Table 11.1.1	Annually	Operational test with flow, no discharge. [3] Note [3]: At this time it is necessary to check that the set points are the same as the original.	PA 4159
		Editor's Note: A satisfactory test of the optical detector system is required demonstrating operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system. This test can be conducted in conjunction with the annual test required in B.9 above.	

A27. Control Panels — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	V: Visual inspection.	PA 4158
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4158
		Editor's Note: The functional test without flow or discharge is intended to show operation of all fire protection system functions.	
NFPA 409 2016 Table 11.1.1	Annually	Operational test with flow, no discharge.	PA 4158
		Editor's Note: A satisfactory test demonstrates operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system. This test can be conducted in conjunction with the annual test required in #9 above.	

A28. Alarm Transmission (Local and Remote) Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Functional test, no flow.	PA 4158
		Editors's Note: The functional test without discharge conducted is intended to show transmission of selected circuits demonstrating continued operation of the system. Testing should be planned to include all circuits on an annual basis. At a minimum, control equipment shall be tested 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.	

A29. Tamper Switch Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Quarterly	Functional test, no flow.	PA 4158
NFPA 25 2017 13.3.3.5.1	Quarterly	Valve supervisory switches shall be tested semiannually.	PA 4158
NFPA 25 2017 13.3.3.5.2		A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.	
NFPA 25 2017 13.3.3.5.3		The signal shall not be restored at any valve position except the normal position.	

A30. Flow Indication Switch Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Annually	Operational test with flow, no discharge.	PA 4158
		Editor's Note: Aside from routine inspection, testing, and maintenance of waterflow alarm devices as identified in other chapters of this Manual, this operational test is intended to demonstrate the satisfactory performance of all designed functions.	
NFPA 25 2017 5.3.2.1	Quarterly	Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly.	PA 4158
NFPA 25 2017 5.3.2.2*	SemiAnnually	Vane-type and pressure switch–type waterflow alarm devices shall be tested semiannually.	PA 4158
NFPA 25 2017 5.3.2.3		Testing of pressure switch–type waterflow alarm devices on wet pipe systems shall be accomplished by opening the inspector's test connection.	
NFPA 25 2017 5.3.2.3.1		Where freezing weather conditions or other circumstances prohibit use of the inspector's test connection, the bypass connection shall be permitted to be used.	
NFPA 25 2017 5.3.2.4		Testing of vane-type waterflow alarm devices on wet pipe systems shall be accomplished by a flow of water equivalent to the flow out of the smallest single k-factor sprinkler (or smaller) past the flow switch.	
NFPA 25 2017 5.3.2.5		Fire pumps shall not be taken out of service during testing unless constantly attended by qualified personnel or all impairment procedures contained in Chapter 15 are followed.	

A31. Supervisory Alarms — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4158
		Editor's Note: With the exception of the valve tamper switch requirement identified above, all other supervisory alarms shall be functionally tested without discharging the system including but not limited to high and low air pressure switches, room temperature switches, water level switches, Primary (main) power supply, etc.	

A32. Manual Actuation Stations — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4159
NFPA 25 2017 13.4.3.2.6*	SemiAnnually	Manual Operation. Manual actuation devices shall be operated annually.	PA 4159

A33. Hangar Floor Drain Sys. & Separators — Inspection / Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4161
		Editor's Note: The inspection must include all components of the hangar floor drainage system and separators. Floor trench drainage systems may be installed to effectively dispose of water used for cleaning aircraft and hangar floor surfaces and water accumulation from possible flooding due to high groundwater tables, and to drain away water discharged from the fire protection equipment provided within the structure.	
NFPA 409 2016 Table 11.1.1	5 Years	Operational test with actual discharge.	PA 4161
		Editor's Note: The operational test with actual discharge required may be in conjunction with the full discharge test of the system.	

A34. Fire Doors — Inspection

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection	PA 4161
NFPA 80 2016 5.1.2.2		Doors, shutters, and windows shall be kept closed and latched or arranged for automatic closing.	
NFPA 80 2016 5.1.2.3		Prevention of Door Blockage.	
NFPA 80 2016 5.1.2.3.1		Door openings and their surrounding areas shall be kept clear of anything that could obstruct or interfere with the free operation of the door.	
NFPA 80 2016 5.1.2.3.2		Where necessary, a barrier shall be built to prevent the piling of material against sliding doors.	
NFPA 80 2016 5.1.2.3.3		Blocking or wedging of doors in the open position shall be prohibited.	
NFPA 80 2016 A.5.2		Doors, shutters, and windows are of no value unless they are properly maintained and closed or are able to close at the time of fire. A periodic inspection and maintenance program is generally the responsibility of the building owner.	
NFPA 80 2016 5.2.3.8*		Fusible links, release devices, and any other moveable parts shall not be painted or coated with other materials that could interfere with the operation of the assembly.	
NFPA 80 2016 A.5.2.3.8		Movable parts of the door assembly can include, but are not limited to, stay rollers, gears, and closing mechanisms.	

NFPA 80 2016 5.2.4.1*	Monthly	Periodic inspections and testing shall be performed not less than annually.	
NFPA 80 2016 A.5.2.4.1		Doors subject to high-volume use and abuse might warrant an increased frequency of inspection. Components including, but not limited to, hinges, catches, closers, latches, and stay rollers are especially subject to wear.	
NFPA 80 2016 5.2.4.7		Tin-clad and kalamein doors shall be inspected for dry rot of the wood core.	
NFPA 80 2016 5.2.4.8		Chains or cables employed shall be inspected for excessive wear, stretching, and binding.	
NFPA 80 2016 5.2.2.4		A record of all inspections and testing shall be provided that includes, but is not limited to, the following information: (1) Date of inspection (2) Name of facility (3) Address of facility (4) Name of person(s) performing inspections and testing (5) Company name and address of inspecting company (6) Signature of inspector of record (7) Individual record of each inspected and tested fire door assembly (8) * Opening identifier and location of each inspected and tested fire door assembly (9) * Type and description of each inspected and tested fire door assembly (10) * Verification of visual inspection and functional operation (11) Listing of deficiencies in accordance with 5.2.3, Section 5.3, and Section 5.4	
NFPA 80 2016 A.5.2.2.4(8)		Each fire door assembly inspected and tested should be assigned a unique identifier code (e.g., door number as assigned by the facility) that can be used to track the assembly's compliance and maintenance records throughout the lifetime of its installation. Identifier codes could be a door assembly number, barcode, or other code that is unique to each fire door assembly.	
NFPA 80 2016 A.5.2.2.4(9)		To aid the AHJ during the review of the inspections and testing reports, the records should include a description of the type of fire door assembly as follows: Type 6: Swinging door with builders hardware Type 7: Swinging fire door with fire door hardware Type 8: Horizontally sliding fire door Type 9: Special purpose horizontally accordion or folding door Type 10: Vertically sliding fire door Type 11: Rolling steel door Type 12: Fire shutter Type 13: Service counter fire door Type 14: Hoistway doors for elevators and dumbwaiter Type 15: Chute door Type 16: Access door Type 17: Fire window	

A35. Fire Doors — Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Annually	Functional test, no flow.	PA 4161
NFPA 80 2016 5.1.2.1*		Doors, shutters, and windows shall be operable at all times.	
NFPA 80 2016 A.5.1.2.1		Operability issues may include proper operation and function of latching hardware and closing devices. Latching hardware should not be modified to prevent positive latching.	
NFPA 80 2016 5.1.2.2		Doors, shutters, and windows shall be kept closed and latched or arranged for automatic closing.	
NFPA 80 2016 5.2.3.2*		Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.	
NFPA 80 2016 A.5.2.3.2		Any fire door or fire window assembly or component that has a history of reoccurring failures should be evaluated for possible replacement or other corrective measures.	
NFPA 80 2016 5.2.3.7.1		All fire doors, fire shutters, and fire window assemblies shall be inspected and tested to check for proper operation and full closure.	
NFPA 80 2016 5.2.3.7.2		Resetting of the automatic-closing device shall be done in accordance with the manufacturer's instructions.	
NFPA 80 2016 5.2.4.3		Inspection shall include an operational test for automatic-closing doors and windows to verify that the assembly will close under fire conditions.	

NFPA 80 2016 5.2.4.4		The assembly shall be reset after a successful test.	
NFPA 80 2016 5.2.4.5		Resetting of the release mechanism shall be done in accordance with the manufacturer's instructions.	
NFPA 80 2016 5.2.4.6*		Hardware shall be examined, and inoperative hardware, parts, or other defective items shall be replaced without delay.	
NFPA 80 2016 5.5.1*		Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.	
NFPA 80 2016 5.5.2		Damaged glazing material shall be replaced with labeled glazing.	
NFPA 80 2016 5.5.3		Replacement glazing materials shall be installed in accordance with their individual listing.	
NFPA 80 2016 5.5.4		Any breaks in the face covering of doors shall be repaired without delay.	
NFPA 80 2016 5.5.5		Where a fire door, frame, or any part of its appurtenances is damaged to the extent that it could impair the door's proper emergency function, the following actions shall be performed: (1) The fire door, frame, door assembly, or any part of its appurtenances shall be repaired with labeled parts or parts obtained from the original manufacturer. (2) The door shall be tested to ensure emergency operation and closing upon completion of the repairs.	
NFPA 80 2016 5.5.6		If repairs cannot be made with labeled components or parts obtained from the original manufacturer or retrofitted in accordance with Section 5.3, the fire door frame, fire door assembly, or appurtenances shall be replaced.	
NFPA 80 2016 5.5.7		When fastener holes are left in a door or frame due to changes or removal of hardware or plant-ons, the holes shall be repaired by the following methods: (1) Install steel fasteners that completely fill the holes. (2) Fill the screw or bolt holes with the same material as the door or frame. (3) Fill holes with material listed for this use and installed in accordance with the manufacturer's procedures.	
NFPA 80 2016 5.5.8		Holes, other than those as described by 5.5.7, shall be treated as a field modification in accordance with 5.1.4.	
NFPA 80 2016 5.5.9*		Upon completion of maintenance work, fire door assemblies shall be inspected and tested in accordance with 5.2.3. A record of these inspections and testing shall be made in accordance with 5.2.2. A record of maintenance performed on existing fire door assemblies shall be provided that includes the following information: (1) Date of maintenance (2) Name of facility (3) Address of facility (4) Name of person(s) performing maintenance (5) Company name and address of maintenance personnel (6) Signature of maintenance personnel performing the work (7) Individual listings of each inspected and tested fire door assembly (8) Opening identifier and location of each repaired fire door assembly (9) Type and description of each repaired fire door assembly (10) Description or listing of the work performed on each fire door assembly	
NFPA 80 2016 A.5.5.9		Existing fire door assemblies that have been repaired should be inspected and tested immediately upon completion of the repair work to ensure that they are in compliance with this standard. Records of maintenance work should be maintained with the periodic inspections and testing records for the facility	
NFPA 80 2016 A.5.5.9(10)		When maintenance work on an existing fire door assembly is required as the result of a periodic inspections and testing report to correct deficiencies, the maintenance report should reference the inspections and testing report where the deficiencies were cited to show that the follow up work was performed. Descriptions of the work performed on fire door assemblies should document the nature of the work (i.e., replaced surface mounted door closer, installed new gasketing). Where the work performed included field modifications permitted by the laboratory, in accordance with 5.1.5.2 and approved by the AHJ, documentation of the permission and approval should be attached to the maintenance report.	

A36. Gas Detectors — Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	Monthly	Visual inspection.	PA 4159
		Editor's Note: The inspection must include all components of the gas detection system.	
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4159
		Editor's Note: The functional test without discharging the system is conducted as prescribed by the manufacturer and as necessary for the application.	

A37. Ventilation System in Pits, Tunnels, & Ducts — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	SemiAnnually	Functional test, no flow.	PA 4161
		Editor's Note: Functional testing is conducted demonstrating satisfactory operation of the system.	

A38. Grounding Equipment — Testing

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
NFPA 409 2016 Table 11.1.1	5 Years	Functional test, no flow.	PA 4158
		Editor's Note: The functional test required may be completed in conjunction with full discharge test of the system.	

B. Emergency Fuel Shutoff Systems

The emergency fuel shutoff systems referenced in this section focus on fixed systems involved with fuel transfer operations. Fuel shutoff systems installed on tank fueling trucks would be The requirements for emergency fuel shutoffs include but are not limited to aviation fueling hydrant systems, fuel loading racks, fuel pump stations

B1. Emergency Fuel Shutoff Systems Inspection / Testing / Maintenance

Reference/ Section	Jurisdiction/ Frequency	Requirements / Details / Information	Form
FCNYS 2020 2006.6		Emergency Fuel Shutoff Emergency fuel shutoff controls and procedures shall comply with Sections 2006.6.1 through 2006.6.4.	
IFCNJ 2015 2006.6.1		Accessibility Emergency fuel shutoff controls shall be readily accessible at all times when the fueling system is being operated.	
NYCFC 2014 1106.6.2		Notification of the department. The owner or operator of the aviation facility shall establish a procedure by which the department will be notified in the event of an emergency involving the activation of an emergency fuel shutoff control.	
FCNYS 2020 2006.6.3		Determining Cause Prior to reestablishment of normal fuel flow, the cause of fuel shutoff conditions shall be determined and corrected.	
NYCFC 2014 1106.6.4	Quarterly	Testing. Emergency fuel shutoff devices shall be operationally tested at intervals not exceeding 3 months. The fueling-system operator shall maintain suitable records of these tests.	PA 4171

AVIATION FACILITIES – HANGARS

PA 4153 / 12-20

SPRINKLERS / HANGERS / PIPING – INSPECTION
AUXILIARY DRAINS – MAINTENANCE

Building ID:

- Use this form to document inspection, testing of sprinkler system sprinklers, hangers, and piping.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Sprinklers – Inspection – Annually – {Reference C18A1} -** Sprinklers shall be inspected from the floor level annually. Any sprinkler that shows signs of any of the following shall be replaced:
   (1) Leakage
   (2) Corrosion detrimental to sprinkler performance
   (3) Physical damage
   (4) Loss of fluid in the glass bulb heat-responsive element
   (5) Loading detrimental to sprinkler performance
   (6) Paint other than that applied by the sprinkler manufacturer

2. **Spare Sprinklers – Inspection – Annually – {Reference C18A1} –** The supply of spare sprinklers shall be inspected annually for the following:
   (1) The correct number and type of sprinklers as required by 5.4.1.5
   (2) A sprinkler wrench for each type of sprinkler as required by 5.4.1.5.5
   (3) The list of spare sprinklers as required by 5.4.1.5.6

3. **Pipe and Fittings – Inspection – Annually – {Reference C18A2} –** Sprinkler pipe and fittings shall be inspected annually from the floor level. Pipe and fittings shall be free of mechanical damage, leakage, and corrosion.

4. **Pipe and Fittings – Testing – 5 Years – {Reference C18A2} –** Sprinkler pipe and fittings shall be observed during the full flow testing of the system.

5. **Dry Pipe System – Auxiliary Drains - Maintenance – Annually & As Needed – {Reference C18A6} –** Auxiliary drains in dry pipe sprinkler systems shall be drained after each operation of the system, before the onset of freezing weather conditions, and thereafter as needed.

6. **Deluge / Preaction Systems – Auxiliary Drains - Maintenance – Annually & As Needed – {Reference C18A4, C18A5} –** Auxiliary drains in preaction / deluge systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).
   - Low points equipped with a single valve should be drained as follows:
     (1) Open the low-point drain valve slowly.
     (2) Close the drain valve as soon as water ceases to discharge, and allow time for additional accumulation above the valve.
     (3) Repeat this procedure until water ceases to discharge.
     (4) Replace plug or nipple and cap as necessary.
   - Low points equipped with dual valves should be drained as follows:
     (1) Close the upper valve.
     (2) Open the lower valve, and drain the accumulated water.
     (3) Close the lower valve, open the upper valve, and allow time for additional water accumulation.
     (4) Repeat this procedure until water ceases to discharge.
     (5) Replace plug or nipple and cap in lower valve.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
ALARM VALVES – INSPECTION / TESTING

PA 4154 / 12-20

Building ID:

- Use this form to document inspection, testing of alarm valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Alarm Valves – Exterior Inspection – Monthly – {Reference C18A3} –** Externally inspect alarm valves and system riser check valves to verify the following:
   (1) The gauges indicate normal supply water pressure is being maintained.
   (2) The valves and trim are free of physical damage.
   (3) All valves are in the appropriate open or closed position.
   (4) The retarding chamber or alarm drains are not leaking.

2. **Alarm Valves – Interior Inspection – 5 Years – {Reference C18A3} –** Alarm valves and their associated strainers, filters, and restriction orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.

3. **Alarm Devices – Testing – Quarterly – {Reference C18A3}** – Operational test with flow, no discharge. Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly. Vane-type and pressure switch–type waterflow alarm devices shall be tested.

S = Satisfactory **U = Unsatisfactory**

Valve ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
DELUGE VALVES – INSPECTION / TESTING

PA 4155 / 12-20

Building ID:

- Use this form to document inspection, testing of deluge valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Deluge Valve – Exterior Inspection – Monthly – {Reference C18A4} –** The deluge valve shall be externally inspected monthly to verify the following:
   (1) The valve is free from physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The valve seat is not leaking.
   (4) Electrical components are in service.

2. **Deluge Valve – Testing – Annually – {Reference C18A4} –** Operational test with flow, no discharge. The operational test conducted is a partial trip test with the control valve partially open to initiate flow but not discharge water into the system. A partial flow trip test is conducted in the following manner:
   (1) Fully open the main drain valve to clean any accumulated scale or foreign material from the supply water piping.
   (2) Close the control valve to the point where additional closure cannot provide flow through the entire area of the drain outlet.
   (3) Close the valve controlling flow to the device if a quick-opening device is installed.
   (4) Record the system air or nitrogen pressure and the supply water pressure.
   (5) Relieve system air or nitrogen pressure by opening the priming level test valve or the inspector's test valve.
   (6) Note and record the air or nitrogen pressure, and supply water pressure when the dry pipe valve trips.
   (7) Immediately close the system control valve, and open the main drain valve to minimize the amount of water entering the system piping.
   (8) Trip test the quick-opening device, if installed, in accordance with the manufacturer's instructions.
   (9) Open all low point drains, and close them when water ceases to flow.
   (10) Reset the dry pipe valve and quick-opening device, if installed, in accordance with the manufacturer's instructions, and return the system to service.

3. **Deluge Valve – Testing – 5 Years – {Reference C18A4} –** Operational test with actual discharge. Operational tests generally should be comprised of the following:
   (1) A detection/actuation test with no flow to verify that all components such as automated valves, foam and water pumps, and alarms operate properly
   (2) A water-only flow test to inspect piping continuity, discharge patterns, pressures, and line flushing
   (3) A foam flow test to verify solution concentration
   (4) Resetting of system to its normal standby condition, including draining of lines and filling of foam liquid tank

4. **Deluge Valve – Manual Actuation Devices – Testing – Annually – {Reference C18A4} –** Manual actuation devices shall be operated annually.

S = Satisfactory **U = Unsatisfactory**

Valve ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
PREACTION VALVES – INSPECTION / TESTING

PA 4156 / 12-20

Building ID:

- Use this form to document inspection, testing of preaction valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Preaction Valve – Exterior Inspection – Monthly – {Reference C18A5} –** Externally inspect the dry pipe valve to verify the following:
   (1) The valve is free from physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The valve seat is not leaking.
   (4) Electrical components are in service

2. **Preaction Valve – Interior Inspection – Annually/5 Years– {Reference C18A5} –** The interior of the preaction valve and the condition of detection devices shall be inspected annually when the trip test is conducted. Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.

3. **Preaction Valve – Testing – Annually – {Reference C18A5} –** Operational test with actual discharge. The operational test is performed with the control valve fully open.

4. **Preaction Valve – Manual Actuation Devices – Testing – Annually – {Reference C18A5} –** Manual actuation devices shall be operated annually.

5. **Preaction Valve – Air Pressure Maintenance Devices – Testing – Annually – {Reference C18A5} –** Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction valve trip test, in accordance with the manufacturer's instructions.

6. **Preaction Valve – Priming Water Level – Testing – Quarterly – {Reference C18A5} –** The priming water level in supervised preaction systems shall be tested quarterly for compliance with the manufacturer's instructions.

7. **Preaction Valve – Air Leakage – Testing – 3 Years – {Reference C18A5} –** Preaction systems shall be tested once every 3 years for air leakage, using one of the following test methods:
   (1) Perform a pressure test at 40 psi (3.2 bar) for 2 hours. The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
   (2) With the system at normal system pressure, shut off the air source (compressor or shop air) for 4 hours. If the low air pressure alarm goes off within this period, the air leaks shall be addressed.

S = Satisfactory **U = Unsatisfactory**

Valve ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
DRY PIPE VALVES –INSPECTION / TESTING

PA 4157 / 12-20

Building ID:

- Use this form to document inspection, testing of dry pipe valves.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Dry Pipe Valve – Exterior Inspection – Monthly – {Reference C18A6}** – Externally inspect the dry pipe valve to verify the following:
   (1) The valve is free of physical damage.
   (2) All trim valves are in the appropriate open or closed position.
   (3) The intermediate chamber is not leaking.

2. **Dry Pipe Valve – Interior Inspection – Annually – {Reference C18A6}** – The interior of the dry pipe valve shall be inspected annually when the trip test is conducted.

3. **Dry Pipe Valve – Testing – Annually – {Reference C18A6}** – Operational test with actual discharge. The operational test with actual discharge follows the same requirements for the dry pipe valve full flow test.

4. **Dry Pipe Valve – Low Air Pressure Alarms – Testing – Annually – {Reference C18A6}** – Low air pressure alarms, if provided, shall be tested annually in accordance with the manufacturer's instructions.

5. **Dry Pipe Valve – Air Pressure Maintenance Devices – Testing – Annually – {Reference C18A6}** – Automatic air pressure maintenance devices, if provided, shall be tested annually during the dry pipe valve trip test in accordance with the manufacturer's instructions.

6. **Dry Pipe Valve – Priming Water Level – Testing – Quarterly – {Reference C18A6}** – The priming water level shall be tested quarterly.

7. **Dry Pipe Valve – Quick Opening Devices – Testing – Quarterly – {Reference C18A6}** – Quick-opening devices, if provided, shall be tested quarterly.

8. **Dry Pipe Valve – Gas Leakage – Testing – 3 Years – {Reference C18A6}** – Dry pipe systems shall be tested once every 3 years for gas leakage, using one of the following test methods:
   (1) A gas (air or nitrogen) pressure test at 40 psi (3.2 bar) shall be performed for 2 hours.
   (2) The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test.
   (3) Gas leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
   (4) With the system at normal system pressure, the gas source (nitrogen supply, compressor, or shop air) shall be shut off for 4 hours. If the low pressure alarm goes off within this period, the leaks shall be addressed.

S = Satisfactory **U = Unsatisfactory**

Valve ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
ALARM DEVICES / CONTROL PANELS / GROUNDING EQUIPMENT
INSPECTION / TESTING

PA 4158 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Control Valve Tamper Switch – Testing – Quarterly – {Reference C18A29} –** Functional test, no flow - A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.

2. **Flow Indication Switch – Testing – Quarterly/SemiAnnually/Annually – {Reference C18A30} –** Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly. Vane-type and pressure switch–type waterflow alarm devices shall be tested semiannually.

3. **Flow Indication Switch – Testing – Annually – {Reference C18A30} –** Operational test with flow, no discharge. Aside from routine inspection, testing, and maintenance of waterflow alarm devices as identified, this operational test is intended to demonstrate the satisfactory performance of all designed functions.

4. **Supervisory Alarms – Testing – SemiAnnually – {Reference C18A31} –** Functional test, no flow. With the exception of the valve tamper switch requirement identified above, all other supervisory alarms shall be functionally tested without discharging the system including but not limited to high and low air pressure switches, room temperature switches, water level switches, Primary (main) power supply, etc.

5. **Alarm Transmission (Local and Remote) – Testing – Monthly – {Reference C18A28} –** Functional test, no flow. The functional test without discharge conducted is intended to show transmission of selected circuits demonstrating continued operation of the system. Testing should be planned to include all circuits on an annual basis. At a minimum, control equipment shall be tested 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.

6. **Control Panels – Inspection/Testing – Monthly/SemiAnnually/Annually – {Reference C18A27}**
   (a) Monthly – Visual inspection.
   (b) SemiAnnually – Functional test, no flow. The functional test without flow or discharge is intended to show operation of all fire protection system functions.
   (c) Annually – A satisfactory test demonstrates operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system.

7. **Grounding Equipment – Testing – 5 Years – {Reference C18A38} –** Functional test, no flow. The functional test required may be completed in conjunction with full discharge test of the system.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
DETECTORS / MANUAL STATIONS – INSPECTION / TESTING

PA 4159 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Pneumatic Detector – Testing – SemiAnnually/Annually – {Reference C18A24}**
   (a) SemiAnnually – Functional test, no flow. A test demonstrating satisfactory pneumatic detector system operation is required.
   (b) Annually - Operational test with flow, no discharge. A satisfactory test of the pneumatic detector system is required demonstrating operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system.

2. **Electric Detector – Testing – SemiAnnually/Annually – {Reference C18A25}**
   (a) SemiAnnually – Functional test, no flow. A test demonstrating satisfactory electric detector system operation is required.
   (b) Annually - Operational test with flow, no discharge. A satisfactory test of the electric detector system is required demonstrating operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system.

3. **Optical Detector – Inspection/Testing – Weekly/SemiAnnually/Annually – {Reference C18A26}**
   (a) Weekly – Visual inspection.
   (b) SemiAnnually – Functional test, no flow. A test demonstrating satisfactory optical detector system operation is required.
   (c) Annually – Operational test with flow, no discharge. A satisfactory test of the electric detector system is required demonstrating operation of all fire protection system functions including activation of the deluge valve with flow but not discharging into the system.

4. **Gas Detector – Inspection/Testing – Monthly/SemiAnnually – {Reference C18A36}**
   (a) Monthly – Visual inspection - The inspection must include all components of the gas detection system.
   (b) SemiAnnually – Functional test, no flow. The functional test without discharging the system is conducted as prescribed by the manufacturer and as necessary for the application.

5. **Manual Actuation Stations – Testing – SemiAnnually – {Reference C18A32} –** Functional test, no flow. Manual actuation devices shall be operated annually.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS

PA 4160 / 12-20

HOSE STATIONS / FOAM GENERATORS – INSPECTION / TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of hose stations, foam generators.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Hose Stations – Inspection – Monthly – {Reference C18A12}** – Visual inspection. Table 11.1.1 in NFPA 409 identifies requirements for hose stations focusing on the foam system hand hose stations required by this standard. The inspection details identified below are a combination of standpipe system requirements.

Hose connections shall be inspected annually for the following conditions:	Hose storage devices shall be inspected annually for the following conditions:
(1) Valve cap(s) missing or damaged (2) Fire hose connection damaged (3) Valve handles missing or damaged (4) Cap gaskets missing or deteriorated (5) Valve leaking (6) Visible and physical obstructions to hose connections (7) Pressure restricting device missing (8) Manual, semiautomatic, or dry standpipe valve does not operate smoothly (9) Valve threads damaged	(1) Difficult to operate (2) Damaged (3) Visible or physical obstruction (4) Hose improperly racked or rolled (5) Nozzle clip not in place and nozzle not correctly contained (6) Hose rack enclosed in cabinet not swinging out at least 90 degrees

2. **Hose Stations – Testing – 5 Years – {Reference C18A12}** – Operational test with actual discharge. An operational test with actual discharge is required for all hose stations and may be conducted in conjunction with full discharge test of the system.

3. **Water Powered High Expansion Foam Generator – Inspection – Monthly – {Reference C18A22}** – Visual inspection.

4. **Water Powered High Expansion Foam Generator – Testing – Annually/5 Years – {Reference C18A22}**
   (a) Annually - Operational test with actual discharge. This test is intended to be an operational test with water only. This test is to be conducted from each foam generator.
   (b) 5 Years - Operational test with actual discharge. This test is intended to be an operational test with foam from each foam generator.

5. **Electric Powered High Expansion Foam Generator – Inspection – Monthly – {Reference C18A23} -** Visual inspection.

6. **Electric Powered High Expansion Foam Generator – Testing – Annually/5 Years – {Reference C18A23}**
   (a) Annually – Functional test, no flow. This test is intended to be an operational test with water only. This test is to be conducted from each foam generator.
   (b) 5 Years - Operational test with actual discharge. This test is intended to be an operational test with foam from each foam generator

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS

PA 4161 / 12-20

FIRE DOORS / FLOOR DRAIN SYSTEMS / VENTILATION SYSTEMS
INSPECTIONS / TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of fire doors, drain systems, ventilation systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fire Doors – Inspection – Monthly – {Reference C18A34}** – Visual inspection.
   - Doors, shutters, and windows shall be kept closed and latched or arranged for automatic closing.
   - Door openings and their surrounding areas shall be kept clear of anything that could obstruct or interfere with the free operation of the door.
   - Blocking or wedging of doors in the open position shall be prohibited.
   - Fusible links, release devices, and any other moveable parts shall not be painted or coated with other materials that could interfere with the operation of the assembly.

2. **Fire Doors – Testing/Maintenance – Annually – {Reference C18A34}** – Functional test, no flow.
   - Doors, shutters, and windows shall be operable at all times.
   - Operability issues may include proper operation and function of latching hardware and closing devices. Latching hardware should not be modified to prevent positive latching.
   - Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.
   - All fire doors, fire shutters, and fire window assemblies shall be inspected and tested to check for proper operation and full closure.
   - Inspection shall include an operational test for automatic-closing doors and windows to verify that the assembly will close under fire conditions.
   - Hardware shall be examined, and inoperative hardware, parts, or other defective items shall be replaced without delay.
   - Repairs shall be made, and defects that could interfere with operation shall be corrected without delay.
   - Existing fire door assemblies that have been repaired should be inspected and tested immediately upon completion of the repair work to ensure that they are in compliance with this standard.

3. **Hangar Floor Drain Sys. & Separators – Inspection – Monthly – {Reference C18A33}** – Visual inspection. The inspection must include all components of the hangar floor drainage system and separators. Floor trench drainage systems may be installed to effectively dispose of water used for cleaning aircraft and hangar floor surfaces and water accumulation from possible flooding due to high groundwater tables, and to drain away water discharged from the fire protection equipment provided within the structure.

4. **Hangar Floor Drain Sys. & Separators – Testing – 5 Years – {Reference C18A33}** – Operational test with actual discharge. The operational test with actual discharge required may be in conjunction with the full discharge test of the system.

5. **Ventilation System in Pits, Tunnels, & Ducts – Testing – SemiAnnually – {Reference C18A37}** – Functional test, no flow. Functional testing is conducted demonstrating satisfactory operation of the system.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
NO-FLOW FIRE PUMP TESTING – ELECTRIC FIRE PUMPS

PA 4162 / 12-20

Building ID: **Pump ID:**

- Use this form to document inspection, testing, maintenance of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **No-Flow Fire Pump Testing – Testing – Weekly – {Reference C18A9}** – Functional test, no flow. A weekly test frequency shall be required for the following electric fire pumps:
   (1) Fire pumps that serve fire protection systems in buildings that are beyond the pumping capacity of the fire department
   (2) Fire pumps with limited service controllers
   (3) Vertical turbine fire pumps
   (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

2. **No-Flow Fire Pump Testing – Visual Observations – {Reference C18A9} -** The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is idle:
   (1) Record the system suction and discharge pressure gauge readings.
   (2) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log where such information is available without having to open an energized electric motor–driven fire pump controller.
   (3) If the highest or lowest pressure is outside of the expected range, record all information from the event log that helps identify the abnormality.

3. **No-Flow Fire Pump Testing – Visual Observations – {Reference C18A9} –** The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running. The test shall be conducted by starting the pump automatically. The electric pump shall run a minimum of 10 minutes.
   (1) Pump system procedure is as follows:
      (a) Record the pump starting pressure from the pressure switch or pressure transducer.
      (b) Record the system suction and discharge pressure gauge readings.
      (c) Inspect the pump packing glands for slight discharge.
      (d) Adjust gland nuts if necessary.
      (e) Inspect for unusual noise or vibration.
      (f) Inspect packing boxes, bearings, or pump casing for overheating.
      (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge.
      (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log.
      (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water.
   (2) Electrical system procedure is as follows:
      (a) Observe the time for motor to accelerate to full speed.
      (b) Record the time controller is on first step (for reduced voltage or reduced current starting).
      (c) Record the time pump runs after starting (for automatic stop controllers).

S = Satisfactory **U = Unsatisfactory**

Date of Inspection						
Inspector's Name						
Pump Starting Pressure						
Pump Suction Pressure (Idle / Running)						
Pump Discharge Pressure (Idle / Running)						
Pump Run Time						
Results						

Notes

AVIATION FACILITIES – HANGARS

PA 4163 / 12-20

NO-FLOW FIRE PUMP TESTING – DIESEL FIRE PUMPS

Building ID: **Pump ID**

- Use this form to document inspection, testing, maintenance of fire pump systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **No-Flow Fire Pump Testing – Testing – Weekly – {Reference C18A9}** – Functional test, no flow. A weekly test frequency shall be required.

2. **No-Flow Fire Pump Testing – Visual Observations – {Reference C18A9}** – The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is idle:
   (1) Record the system suction and discharge pressure gauge readings.
   (2) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log where such information is available without having to open an energized electric motor–driven fire pump controller.
   (3) If the highest or lowest pressure is outside of the expected range, record all information from the event log that helps identify the abnormality.

3. **No-Flow Fire Pump Testing – Visual Observations – {Reference C18A9}** – The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running. The test shall be conducted by starting the pump automatically. The diesel pump shall run a minimum of 30 minutes.
   (1) Pump system procedure is as follows:
      (a) Record the pump starting pressure from the pressure switch or pressure transducer.
      (b) Record the system suction and discharge pressure gauge readings.
      (c) Inspect the pump packing glands for slight discharge.
      (d) Adjust gland nuts if necessary.
      (e) Inspect for unusual noise or vibration.
      (f) Inspect packing boxes, bearings, or pump casing for overheating.
      (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge.
      (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log.
      (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water.
   (2) Diesel engine system procedure is as follows:
      (a) Observe the time for engine to crank.
      (b) Observe the time for engine to reach running speed.
      (c) Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running.
      (d) Record any abnormalities.
      (e) Inspect the heat exchanger for cooling waterflow.

S = Satisfactory **U = Unsatisfactory**

Date of Inspection						
Inspector's Name						
Pump Starting Pressure						
Pump Suction Pressure (Idle / Running)						
Pump Discharge Pressure (Idle / Running)						
Pump Run Time						
Results						

Notes

AVIATION FACILITIES – HANGARS
CONCENTRATE VALVES – INSPECTION / TESTING

PA 4164 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Concentrate Control Valve (Automatic) – Inspection – Monthly – {Reference C18A17}** – Visual inspection. Valves specified to be inspected shall be permitted to be open or closed, depending on specific functions within each foam-water sprinkler system. The position (open or closed) of valves shall be verified in accordance with specified operating conditions.

2. **Concentrate Control Valve (Automatic) – Testing – Annually – {Reference C18A17}** – Operational test with flow, no discharge. An operational test with flow but not discharging into the system is conducted where the automatic concentrate control valve is operated through its full range and returned to its normal position.

3. **Concentrate Control Valve (Automatic) – Testing – 5 Years – {Reference C18A17}** – Operational test with actual discharge. The operational test with actual discharge conducted is in conjunction with full discharge test of the system.

4. **Concentrate Control Valve – Inspection – Monthly – {Reference C18A17} –** Visual inspection. Valves specified to be inspected shall be permitted to be open or closed, depending on specific functions within each foam-water sprinkler system. The position (open or closed) of valves shall be verified in accordance with specified operating conditions.

5. **Concentrate Control Valve – Testing – Annually – {Reference C18A17} –** Functional test, no flow. A functional test without discharge into the system is conducted where the concentrate shutoff valve is operated through its full range and returned to its normal position.

6. **Shutoff Valves – Inspection – Monthly – {Reference C18A7} –** Shutoff valves refer to individual manual shutoff valves such as for monitor nozzles or double check valve assemblies. Shutoff valves shall not be confused with control valves for sprinkler/standpipe systems. Conditions identified below are requirements for control valves and not specifically applicable for shutoff valves. Information is provided as a general guide for valve inspection.
   - The valve inspection shall verify that the valves are in the following condition:
     (1) In the normal open or closed position
     (2) Sealed, locked, or supervised
     (3) Accessible
     (4) Post indicator valves (PIVs) are provided with correct wrenches
     (5) Free from external leaks
     (6) Provided with applicable identification

7. **Shutoff Valves – Testing/Maintenance – Annually – {Reference C18A8} –** Functional test, no flow. Each control valve shall be operated annually through its full range and returned to its normal position. The operating stems of outside screw and yoke valves shall be lubricated annually.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
PA 4165 / 12-20

WATER RESERVOIRS – LEVEL / TEMPERATURE / EXTERIOR INSPECTION / TESTING

Building ID: **Tank ID:**

- Use this form to document inspection and testing of water reservoirs.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
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1. **Water Level – Inspection– Monthly – {Reference C18A11}** – The water level in tanks shall be inspected monthly. The tank shall be maintained full or at the designed water level.

2. **Water Level – Testing – 5 Years – {Reference C18A11} –** Level indicators shall be tested every 5 years for accuracy and freedom of movement.

3. **Water Level Alarms – Testing – SemiAnnually/Annually – {Reference C18A11} –** High and low water level signals shall be tested annually.

4. **Tank Heating Systems – Inspection – Daily/Monthly – {Reference C18A11}** – Tank heating systems installed on tanks equipped with low water temperature alarms supervised in accordance with NFPA 72, connected to a constantly attended location, shall be inspected quarterly during the heating season. Tank heating systems without a supervised low temperature alarm connected to a constantly attended location shall be inspected daily during the heating season.

5. **Water Temperature – Inspection – Weekly/Monthly – {Reference C18A11} -** The temperature of water in tanks without low temperature alarms connected to a constantly attended location shall be inspected and recorded weekly during the heating season when the mean temperature is less than 40°F (4.0°C). The temperature of water in tanks with low temperature alarms supervised in accordance with NFPA 72, connected to a constantly attended location shall be inspected and recorded quarterly during the heating season when the mean temperature is less than 40°F (4.0°C).

6. **Water Reservoirs – Exterior Inspection – Monthly – {Reference C18A11} -** The exterior of the tank, supporting structure, vents, foundation, and catwalks or ladders, where provided, shall be inspected quarterly for signs of obvious damage or weakening. The area surrounding the tank and supporting structure, where provided, shall be inspected quarterly to ensure that the following conditions are met:
   (1) The area is free of combustible storage, trash, debris, brush, or material that could present a fire exposure hazard.
   (2) The area is free of the accumulation of material on or near parts that could result in accelerated corrosion or rot.
   (3) The tank and support are free of ice buildup.
   (4) The exterior sides and top of embankments supporting coated fabric tanks are free of erosion.

S = Satisfactory **U = Unsatisfactory**

Equipment ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
MONITOR NOZZLES – INSPECTIONS / TESTING

PA 4166 / 12-20

Building ID:

- Use this form to document inspection, testing, of monitor nozzles.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Water Powered Monitor Nozzle – Inspection – Monthly – {Reference** Visual inspection consisting of a physical survey of the space or device and surroundings in order to identify any impairment that may have a detrimental effect on performance.

2. **Water Powered Monitor Nozzle – Testing – Annually** – Operational test with actual discharge. The operational test with actual discharge demonstrates the full motion of the nozzle. Discharge of foam solution is not required.

3. **Electric Powered Monitor Nozzle – Inspection – Monthly** – Visual inspection consisting of a physical survey of the space or device and surroundings in order to identify any impairment that may have a detrimental effect on performance.

4. **Electric Powered Monitor Nozzle – Testing – Annually –** Functional test, no flow. The functional test without discharge conducted demonstrates the full motion of the nozzle. Discharge of foam solution is not required.

5. **Electric Powered Monitor Nozzle – Testing – 5 Years –** Operational test with actual discharge. The operational test with actual discharge required can be done in conjunction with full discharge test of the system.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS

PA 4167 / 12-20

FOAM CONCENTRATE / CONCENTRATE PUMP / STRAINER FILTER BASKETS INSPECTION / TESTING

Building ID:

- Use this form to document inspection, testing, maintenance of foam concentrate, concentrate pumps, strainer filter baskets.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Foam Concentrate – Testing – Annually – {Reference C18A14} –** Functional test, no flow. Foam Concentrate Samples. Samples shall be submitted in accordance with the manufacturer's recommended sampling procedures.

2. **Concentrate Storage Tanks – Inspection – Monthly - {Reference C18A15}** – Visual inspection. Inspection of the concentrate tank shall include verification that the quantity of foam concentrate satisfies the requirements of the original design.

3. **Concentrate Pump – Testing – Weekly – {Reference C18A16}** – Functional test, no flow. Churn test.

4. **Concentrate Pump – Testing – Annually – {Reference C18A16}** – Operational test with flow, no discharge.

5. **Concentrate Pump – Testing – 5 Years – {Reference C18A16}** – Operational test with actual discharge.

6. **Strainer Filter Baskets – Testing – Annually & After Each Operation – {Reference C18A13} -** Visual inspection. Mainline and individual discharge device strainers (basket or screen) shall be inspected every 5 years for damaged and corroded parts. Baskets or screens shall be removed and inspected after each operation or flow test.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
FOAM PROPORTIONING DEVICES – INSPECTION / TESTING

PA 4168 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of foam-water sprinkler and foam-water spray fire extinguishing systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Foam Proportioning Device – Standard Pressure Proportioner – Inspection – Monthly – {Reference C18A19} –** Visual Inspection. The inspection shall verify the following:
   (1) Ball drip valves (automatic drains) are free and opened.
   (2) External corrosion on foam concentrate storage tanks is not present.

2. **Foam Proportioning Device – Bladder Tank Proportioner – Inspection – Monthly – {Reference C18A19} –** Visual Inspection. The inspection shall include the following:
   (1) Water control valves to foam concentrate tank
   (2) An inspection for external corrosion on foam concentrate storage tanks
   (3) An inspection for the presence of foam in the water surrounding the bladder (annual)

3. **Foam Proportioning Device – Line Proportioner – Inspection – Monthly – {Reference C18A19} –** The inspection shall include the following:
   (1) *Strainers
   (2) *Verification that pressure vacuum vent is operating freely
   (3) An inspection for external corrosion on foam concentrate storage tanks

4. **Foam Proportioning Device – Standard Balanced Pressure Proportioner – Inspection – Monthly – {Reference C18A19} –** The inspection shall include the following:
   (1) *Strainers
   (2) *Verification that pressure vacuum vent is operating freely
   (3) Verification that gauges are in good operating condition
   (4) Verification that sensing line valves are open
   (5) Verification that power is available to foam liquid pump

5. **Foam Proportioning Device – In-Line Balanced Pressure Proportioner – Inspection – Monthly – {Reference C18A19} –** The inspection shall include the following:
   (1) *Strainers
   (2) *Verification that pressure vacuum vent is operating freely
   (3) Verification that gauges are in good working condition
   (4) Verification that sensing line valves at pump unit and individual proportioner stations are open
   (5) Verification that power is available to foam liquid pump

6. **Foam Proportioning Device – Orifice Plate Proportioner – Inspection – Monthly – {Reference C18A19} –** The inspection shall include the following:
   (1) *Strainers
   (2) *Verification that pressure vacuum vent is operating freely
   (3) Verification that gauges are in good working condition
   (4) Verification that power is available to foam liquid pump

7. **Foam Proportioning Device – Testing – 5 Years – {Reference C18A19} –** Operational test with actual discharge. The operational test with actual discharge conducted is in conjunction with full discharge test of the system.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

AVIATION FACILITIES – HANGARS
FIRE PUMP – ANNUAL PERFORMANCE TESTS

PA 4169 / 12-20

Building ID: **Pump ID:**

Date: **Inspector:**

- Use this form to document the annual testing of fire pump systems.
- Record the measured value or "S" to indicate a satisfactory or "U" if unsatisfactory.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Fire Pump Systems – Testing – {Reference C18A10} –** An annual test of each pump assembly shall be conducted by qualified personnel under no-flow (churn), rated flow, and 150 percent of the pump rated capacity flow of the fire pump by controlling the quantity of water discharged through approved test devices.

- The pertinent visual observations, measurements, and adjustments specified in the following checklists shall be conducted annually while the pump is running and flowing water under the specified output condition:
  - (1) At no-flow condition (churn), the procedure is as follows:
    - (a) Inspect the circulation relief valve for operation to discharge water.
    - (b) Inspect the pressure relief valve (if installed) for proper operation.
  - (2) At each flow condition, the procedure is as follows:
    - (a) Where an external means is provided on the controller, record the electric motor voltage and current (all lines).
    - (b) Record the pump speed in rpm.
    - (c) Record the simultaneous (approximately) readings of pump suction and discharge pressures and pump discharge flow.
  - (3) For electric motor–driven pumps, do not shut down the pump until it has run for 10 minutes.
  - (4) For diesel motor–driven pumps, do not shut down the pump until it has run for 30 minutes.

- For installations having an automatic transfer switch, the following test shall be performed to ensure that the overcurrent protective devices (i.e., fuses or circuit breakers) do not open:
  - (1) Simulate a power failure condition while the pump is operating at peak load.
  - (2) Verify that the transfer switch transfers power to the alternate power source.
  - (3) While the pump is operating at peak load and alternate power, record the following to include in the pump test results:
    - (a) The voltage where an external means is provided on the controller
    - (b) The amperage where an external means is provided on the controller
    - (c) The rpm
    - (d) Suction pressure
    - (e) Discharge pressure
  - (4) Verify that the pump continues to perform at peak horsepower load on the alternate power source for a minimum of 2 minutes.
  - (5) Remove the power failure condition and verify that, after a time delay, the pump is reconnected to the normal power source.

Inspect and Operate Emergency Manual Start		Electric Motor - Check operation of circulation relief valve	
Automatic start functions properly.		Check operation of Main Pressure Relief Valve	
Automatic stop functions properly.		Timer reset and graph paper changed?	
Automatic start:	psi	Timer indicates total run time:	Min
Manual start functions properly.		Electric Motor Pumps - Simulate power failure while pump is operating at peak load.	
Manual stop functions properly.		Electric Motor Pumps - Verify that Transfer Switch transfers power to alternate power source.	
Remote start functions properly.		Electric Motor Pumps - Verify performance of pump at peak load on emergency power source.	
Jockey pump operational.		Electric Motor Pumps - Remove power failure condition and verify pump reconnects to normal power source.	
Jockey pump "turn-on" pressure:	psi	Jockey pump appears properly aligned.	
Jockey pump "turn-off" pressure:	psi	Jockey pump valves open.	

Complete test data and flow charts. (Attach all water-flow charts, electrical power charts, performance curves, etc.)

Notes:

AVIATION FACILITIES – HANGARS **PA 4170 / 12-20**
FIRE PUMP - ANNUAL TEST SUMMARY PAGE

Building ID: **Pump ID:**

Date: **Inspector:**

1. **Reports – {Reference C18A10} -** The report shall contain the following information:
   (1) All raw data necessary for a complete evaluation of the fire pump performance, including suction and discharge pressures, voltage and amperage readings, and pump speed at each flow rate tested.
   (2) The fire protection system demand as furnished by the owner.
   (3) Pump performance, whether satisfactory or unsatisfactory.
   (4) Deficiencies noted during the testing and identified during analysis, with recommendations to address deficiencies as appropriate.
   (5) Manufacturer's performance data, actual performance, and the available pump discharge curves required by this standard.
   (6) Time delay intervals associated with the pump's starting, stopping, and energy source transfer.
   (7) Where applicable, comparison with previous test results.

	Test 1	Test 2	Test 3
Approximate percent of rated pump discharge (gpm)/(L/min)	0	100%	150%
Nozzle size in inches (mm)	No flow		
Pitot pressure in psi (bar)	None		
Flow in gpm (L/min)	None		
Pump suction in psi (bar)			
Pump discharge in psi (bar)			
Net pump head (discharge pressure minus suction pressure)			
Pump speed (rpm)			
Electric Motor - Record electrical voltage			
Electric Motor - Record current (all lines)			
Electric Motor - Operate electric circuit breaker.			
Diesel Engine - Check for excessive back pressure in exhaust system.			

Notes:

AVIATION FACILITIES
EMERGENCY FUEL SHUTOFF SYSTEMS – INSPECTION / TESTING

PA 4171 / 12-20

Building ID:

- Use this form to document inspection, testing, maintenance of emergency fuel shutoff systems.
- Record "S" to indicate a satisfactory or "U" if unsatisfactory in Results.
- The "Result" indicates that the conditions identified below, pertaining to the specific system, have been inspected, tested, or maintained. An unsatisfactory result may include inspections, tests, or maintenance, or components thereof, not performed.
- Use the Notes section to record additional information resultant from the work performed including documentation of deficiencies identified, date corrected, and who performed the corrective work.
- If the work is completed by an outside contractor, attach contractor's report to this form, review for conformity with referenced requirements, indicate results (S/U), and identify deficiencies and corrective actions taken in Notes.

1. **Emergency Fuel Shutoff Systems – Inspection/Testing/Maintenance – Quarterly – {Reference C18B3} –** Emergency fuel shutoff devices shall be operationally tested at intervals not exceeding 3 months. The fueling-system operator shall maintain suitable records of these tests.
   - Accessibility – Emergency fuel shutoff controls shall be readily accessible at all times when the fueling system is being operated.
   - Notification of the department. – The owner or operator of the aviation facility shall establish a procedure by which the department will be notified in the event of an emergency involving the activation of an emergency fuel shutoff control.
   - Determining Cause – Prior to reestablishment of normal fuel flow, the cause of fuel shutoff conditions shall be determined and corrected.

S = Satisfactory **U = Unsatisfactory**

System ID / Device ID	Date	Inspector	Task/Result	Notes

APPENDIX A – DEFINITIONS

Abnormal (Off-Normal) Condition. {72-2016}	A situation, environmental state, or equipment state that warrants some type of signal, notification, communication, response, action, or service. (SIG-FUN)
Access Door. {80-2016}	A door assembly, for installation in fire resistance–rated walls or for installation in ceilings of fire resistance–rated floor–ceiling or roof–ceiling assemblies, that is used to provide access to shafts, chases, attics, spaces above ceilings, or other concealed spaces.
Acknowledge. {72-2016}	To confirm that a message or signal has been received, such as by the pressing of a button or the selection of a software command. (SIG-SSS)
Active Leaf. {80-2016}	The first operating door of a pair, which is usually the door in which a lock is installed.
Additive Pump. {20-2016}	A pump that is used to inject additives into the water stream.
Addressable Device. {72-2016}	A fire alarm system component with discrete identification that can have its status individually identified or that is used to individually control other functions. (SIG-IDS)
Adjust. {25-2017}	To maintain or regulate, within prescribed limits, by setting the operating characteristics to specified parameters. [1911, 2012]
Air Sampling–Type Detector. {72-2016}	A detector that consists of a piping or tubing distribution network that runs from the detector to the area(s) to be protected. An aspiration fan in the detector housing draws air from the protected area back to the detector through air-sampling ports, piping, or tubing. At the detector, the air is analyzed for fire products. (SIG-IDS)
Air-Aspirating Discharge Devices. {11-2016}	Devices specially designed to aspirate and mix air into the foam solution to generate foam, followed by foam discharge in a specific design pattern.
Alarm Condition. {72-2016}	An abnormal condition that poses an immediate threat to life, property, or mission. (SIG-FUN)
Alarm Receiving Facility. {25-2017}	The place where alarm or supervisory signals are received.
Alarm Signal. {72-2016}	A signal that results from the manual or automatic detection of an alarm condition. (SIG-FUN)
Alarm Verification Feature. {72-2016}	A feature of automatic fire detection and alarm systems to reduce unwanted alarms wherein smoke detectors report alarm conditions for a minimum period of time, or confirm alarm conditions within a given time period after being reset, in order to be accepted as a valid alarm initiation signal. (SIG-PRO)
Alarm. {72-2016}	An indication of the existence of a condition that requires immediate response. (SIG-FUN)
Alarms and Indicators. {12-2015}	Any device capable of providing audible, visible, or olfactory indication.
Alcohol-Resistant Foam Concentrate. {16-2015}	A concentrate used for fighting fires on water-soluble materials and other fuels destructive to regular, AFFF, or FFFP foams, as well as for fires involving hydrocarbons. [11, 2010]
Alert Tone. {72-2016}	An attention-getting signal to alert occupants of the pending transmission of a voice message. (SIG-PRO)
Analog Initiating Device (Sensor). {72-2016}	An initiating device that transmits a signal indicating varying degrees of condition as contrasted with a conventional initiating device, which can only indicate an on–off condition. (SIG-IDS)
Ancillary Functions. {72-2016}	Ancillary functions are those nonemergency activations of the fire alarm or mass notification audible, visual, and textual output circuits allowed. Ancillary functions can include general paging, background music, or other non-emergency signals. (SIG-ECS)
Annual Frequency. {25-2017}	Occurring once per year with a minimum of 9 months and a maximum of 15 months.
Annunciator. {72-2016}	A unit containing one or more indicator lamps, alphanumeric displays, or other equivalent means in which each indication provides status information about a circuit, condition, or location. (SIG-FUN)
Antifreeze Sprinkler System. {25-2017}	A wet pipe system using automatic sprinklers that contains a liquid solution to prevent freezing of the system, intended to discharge the solution upon sprinkler operation, followed immediately by water from a water supply. [13, 2016]
Approved. {25-2017}	Acceptable to the authority having jurisdiction.
Aqueous Film-Forming Foam Concentrate (AFFF). {16-2015}	A concentrate based on fluorinated surfactants plus foam stabilizers to produce a fluid aqueous film for suppressing hydrocarbon fuel vapors and usually diluted with water to a 1 percent, 3 percent, or 6 percent solution. [11, 2010]
Atrium. {92-2015}	A large-volume space created by a floor opening or series of floor openings connecting two or more stories that is covered at the top of the series of openings and is used for purposes other than an enclosed stairway; an elevator hoistway; an escalator opening; or as a utility shaft used for plumbing, electrical, air-conditioning, or communications facilities. [101, 2015]
Audible Notification Appliance. {72-2016}	A notification appliance that alerts by the sense of hearing. (SIG-NAS)

Authority Having Jurisdiction (AHJ). {25-2017}	An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.
Automatic Detection Equipment. {25-2017}	Equipment that automatically detects heat, flame, products of combustion, flammable gases, or other conditions likely to produce fire or explosion and cause other automatic actuation of alarm and protection equipment.
Automatic Dry Standpipe System. {14-2016}	A standpipe system permanently attached to a water supply capable of supplying the system demand at all times, containing air or nitrogen under pressure, the release of which (as from opening a hose valve) opens a dry pipe valve to allow water to flow into the piping system and out of the opened hose valve.
Automatic Extinguishing System Supervisory Device. {72-2016}	A device that responds to abnormal conditions that could affect the proper operation of an automatic sprinkler system or other fire extinguishing system(s) or suppression system(s), including, but not limited to, control valves, pressure levels, liquid agent levels and temperatures, pump power and running, engine temperature and overspeed, and room temperature. (SIG-IDS)
Automatic Fire Detector. {72-2016}	A device designed to detect the presence of a fire signature and to initiate action. For the purpose of this Code, automatic fire detectors are classified as follows: Automatic Fire Extinguishing or Suppression System Operation Detector, Fire–Gas Detector, Heat Detector, Other Fire Detectors, Radiant Energy–Sensing Fire Detector, and Smoke Detector. (SIG-IDS)
Automatic Fire Extinguishing or Suppression System Operation Detector. {72-2016}	A device that automatically detects the operation of a fire extinguishing or suppression system by means appropriate to the system employed. (SIG-IDS)
Automatic Flush Bolts. {80-2016}	A mortised bolt installed near the top or bottom of the inactive leaf of a pair of doors that holds the inactive leaf in a closed position until the active leaf is opened.
Automatic Operation. {25-2017}	Operation without human intervention.
Automatic Sprinkler. {13-2016}	A fire suppression or control device that operates automatically when its heat-activated element is heated to its thermal rating or above, allowing water to discharge over a specified area.
Automatic Standpipe System. {25-2017}	A standpipe system that is attached to a water supply capable of supplying the system demand and that requires no action other than opening a hose valve to provide water at hose connections.
Automatic Transfer Switch. {25-2017}	Self-acting equipment for transferring the connected load from one power source to another power source. [110, 2016]
Automatic Wet Standpipe System. {14-2016}	A standpipe system containing water at all times that is attached to a water supply capable of supplying the system demand at all times and that requires no action other than opening a hose valve to provide water at hose connections.
Automatic-Closing Device. {80-2016}	A device that causes the door or window to close when activated by a fusible link or detector.
Automatic-Closing Door. {80-2016}	A door that normally is open but that closes when the automatic-closing device is activated.
Auxiliary Alarm System. {72-2016}	A protected premises fire alarm system or other emergency system at the protected premises and the system used to connect the protected premises system to a public emergency alarm reporting system for transmitting an alarm to the communications center. (SIG-PRS)
Auxiliary Equipment. {17A-2013}	Listed equipment used in conjunction with the wet chemical systems, for example, to shut down power, fuel, or ventilation to the hazard being protected or to initiate signaling devices.
Balanced Pressure Bladder Tank. {11-2016}	A foam concentrate tank fitted with an internal bladder that uses waterflow through a modified venturi-type proportioner to control the foam concentrate injection rate by displacing the foam concentrate within the bladder with water outside the bladder.
Balanced Pressure Pump-Type Proportioning. {11-2016}	A foam proportioning system that utilizes a foam pump and valve(s) to balance foam and water pressures at a modified venturi-type proportioner located in the foam solution delivery piping; a foam concentrate metering orifice is fitted in the foam inlet section of the proportioner.
Bladder Tank Proportioner. {25-2017}	A system that is similar to a standard pressure proportioner, except the foam concentrate is contained inside a diaphragm bag that is contained inside a pressure vessel.
Brail Fire Safety Curtain. {80-2016}	A fire safety curtain that folds up and stores in the space above a proscenium opening.
Branch Duct. {17-2017}	The duct work that contains the exhaust air from a single hood or hazard area.
Branch Lines. {13-2016}	The pipes supplying sprinklers, either directly or through sprigs, drops, return bends, or arm-overs.
Breakaway Connection. {80-2016}	A joint connecting a fire damper sleeve and attached ductwork that will allow collapse of the ductwork during a fire without disturbing the integrity of the fire damper.
Building Fire Alarm System. {72-2016}	A protected premises fire alarm system that includes any of the features identified in 23.3.3.1 and that serves the general fire alarm needs of a building or buildings and that provides fire department or occupant notification or both. (SIG-PRO)

Building Fire Safety Plan. {72-2016}	Documentation that provides information on the use of alarms, transmission of alarms, response to alarms, evacuation of immediate area, evacuation of smoke compartment, preparation of floors and building for evacuation and extinguishment of fire. (SIG-ECS)
Bumper (Fire Safety Curtain). {80-2016}	A filled fabric pocket below the bottom batten or frame member of a fire safety curtain designed to press against the floor.
Bypass-Isolation Switch. {110-2016}	A manually operated device used in conjunction with an automatic transfer switch to provide a means of directly connecting load conductors to a power source and disconnecting the automatic transfer switch.
Caking. {17-2017}	A phenomenon that occurs when moisture chemically reacts with a dry chemical fire-extinguishing agent. This reaction results in materials that, being hydrated by moisture, stick together to form a large agglomerate, or what is more commonly referred to as lumps.
Can Pump. {20-2016}	A vertical shaft turbine–type pump in a can (suction vessel) for installation in a pipeline to raise water pressure.
Carbon Dioxide. {10-2018}	A colorless, odorless, electrically nonconductive inert gas that is a suitable medium for extinguishing Class B and Class C fires.
Carbon Monoxide Alarm Signal. {72-2016}	A signal indicating a concentration of carbon monoxide at or above the alarm threshold that could pose a risk to the life safety of the occupants and that requires immediate action. [720, 2015] (SIG-FUN)
Cartridge/Cylinder-Operated Fire Extinguisher. {10-2018}	A fire extinguisher in which the expellant gas is in a separate container from the agent storage container.
Ceiling Radiation Damper. {80-2016}	A listed device installed in a ceiling membrane of a fire resistance–rated floor-ceiling or roof-ceiling assembly to automatically limit the radiative heat transfer through an air inlet/outlet opening. [5000, 2015]
Central Station Service Alarm System. {72-2016}	A system or group of systems in which the operations of circuits and devices are transmitted automatically to, recorded in, maintained by, and supervised from a listed central station that has competent and experienced servers and operators who, upon receipt of a signal, take such action as required by this Code. Such service is to be controlled and operated by a person, firm, or corporation whose business is the furnishing, maintaining, or monitoring of supervised alarm systems. (SIG-SSS)
Central Station Service. {72-2016}	The use of a system or a group of systems including the protected premises fire alarm system(s) in which the operations of circuits and devices are signaled to, recorded in, and supervised from a listed central station that has competent and experienced operators who, upon receipt of a signal, take such action as required by this Code. Related activities at the protected premises, such as equipment installation, inspection, testing, maintenance, and runner service, are the responsibility of the central station or a listed alarm service local company. Central station service is controlled and operated by a person, firm, or corporation whose business is the furnishing of such contracted services or whose properties are the protected premises. (SIG-SSS)
Central Supervising Station. {72-2016}	A supervising station that is listed for central station service and that also commonly provides less stringent supervising station services such as remote supervising services. (SIG-SSS)
Centrifugal Pump. {20-2016}	A pump in which the pressure is developed principally by the action of centrifugal force.
Channel. {72-2016}	A path for voice or signal transmission that uses modulation of light or alternating current within a frequency band. (SIG-SSS)
Check Valve. {13-2016}	A valve that allows flow in one direction only. [24, 2013]
Circulating Closed-Loop Sprinkler System. {13-2016}	A wet pipe sprinkler system having non–fire protection connections to automatic sprinkler systems in a closed-loop piping arrangement for the purpose of utilizing sprinkler piping to conduct water for heating or cooling, where water is not removed or used from the system but only circulated through the piping system.
Circulation Relief Valve. {25-2017}	A valve used to cool a pump by discharging a small quantity of water. This valve is separate from and independent of the main relief valve. [20, 2016]
Class A Fires. {10-2018}	Class A fires are fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics.
Class B Fires. {10-2018}	Class B fires are fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases.
Class C Fires. {10-2018}	Class C fires are fires that involve energized electrical equipment.
Class D Fires. {10-2018}	Class D fires are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, lithium, and potassium.
Class K Fires. {10-2018}	Class K fires are fires in cooking appliances that involve combustible cooking media (vegetable or animal oils and fats).
Clean Agent. {10-2018}	Electrically non-conducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation.

Clean. {25-2017}	To remove dirt, scale, and debris.
Clearance. {2001-2015}	The air distance between extinguishing system equipment, including piping and nozzles, and unenclosed or uninsulated live electrical components not at ground potential.
Closed Position (Rolling Steel Fire Door). {80-2016}	A position of the door curtain with the underside of the bottom bar, including a compressible seal or sensing edge, if provided, in contact with the sill along the entire width of the opening.
Closing Device. {80-2016}	A means of closing a door from the partially or fully opened position.
Cloud Chamber Smoke Detection. {72-2016}	The principle of using an air sample drawn from the protected area into a high-humidity chamber combined with a lowering of chamber pressure to create an environment in which the resultant moisture in the air condenses on any smoke particles present, forming a cloud. The cloud density is measured by a photoelectric principle. The density signal is processed and used to convey an alarm condition when it meets preset criteria. (SIG-IDS)
Combination Detector. {72-2016}	A device that either responds to more than one of the fire phenomena or employs more than one operating principle to sense one of these phenomena. Typical examples are a combination of a heat detector with a smoke detector or a combination rate-of-rise and fixed-temperature heat detector. This device has listings for each sensing method employed. (SIG-IDS)
Combination Fire/Smoke Damper. {80-2016}	A device that meets both the fire damper and smoke damper requirements.
Combined Dry Pipe–Reaction Sprinkler System. {13-2016}	A sprinkler system employing automatic sprinklers attached to a piping system containing air under pressure with a supplemental detection system installed in the same areas as the sprinklers. Operation of the detection system actuates tripping devices that open dry pipe valves simultaneously and without loss of air pressure in the system. The detection system also serves as an automatic fire alarm system.
Combined Standpipe and Sprinkler System. {25-2017}	A system where the water piping services both 2½ in. (65 mm) outlets for fire department use and outlets for automatic sprinklers.
Common Duct. {17-2017}	The duct work containing the exhaust air from two or more branch ducts.
Communications Channel. {72-2016}	A circuit or path connecting a subsidiary station(s) to a supervising station(s) over which signals are carried. (SIG-SSS)
Compressed Air Foam (CAF). {11-2016}	A homogenous foam produced by the combination of water, foam concentrate, and air or nitrogen under pressure.
Compressed Air Foam Discharge Devices. {11-2016}	Devices specifically designed to discharge compressed air foam in a predetermined pattern.
Compressed Air Foam System (CAFS). {11-2016}	A system employing compressed air foam discharge devices or hoses attached to a piping system through which foam is transported from a mixing chamber.
Compressed Air Foam-Generating Method. {11-2016}	A method of generating compressed air foam recognized in this standard by using a mixing chamber to combine air or nitrogen under pressure, water, and foam concentrate in the correct proportions.
Concealed Sprinkler. {25-2017}	A recessed sprinkler with cover plate. [13, 2016]
Concentration. {16-2015}	The percent of foam concentrate contained in a foam solution. [11, 2010]
Continuous Obstruction. {13-2016}	An obstruction located at or below the level of sprinkler deflectors that affect the discharge pattern of two or more adjacent sprinklers.
Control Mode Density/Area (CMDA) Sprinkler. {13-2016}	A type of spray sprinkler intended to provide fire control in storage applications using the design density/area criteria described in this standard.
Control Mode Specific Application (CMSA) Sprinkler. {13-2016}	A type of spray sprinkler that is capable of producing characteristic large water droplets and that is listed for its capability to provide fire control of specific high-challenge fire hazards.
Control Mode Specific Application (CMSA) Sprinkler. {13-2016}	A large drop sprinkler is a type of CMSA sprinkler that is capable of producing characteristic large water droplets and that is listed for its capability to provide fire control of specific high-challenge fire hazards.
Control Mode Specific Application (CMSA) Sprinkler. {25-2017}	A type of spray sprinkler that is capable of producing characteristic large water droplets and that is listed for its capability to provide fire control of specific high-challenge fire hazards. [13, 2016]
Control Valve. {25-2017}	A valve controlling flow to water-based fire protection systems.
Conventional Pin Rack. {25-2017}	A hose rack where the hose is folded vertically and attached over the pins.
Coordinator. {80-2016}	A device used on pairs of swinging doors that prevents the active leaf from closing before the inactive leaf closes.
Corrosion-Resistant Sprinkler. {25-2017}	A sprinkler fabricated with corrosion-resistant material, or with special coatings or platings, to be used in an atmosphere that would normally corrode sprinklers. [13, 2016]

Coupled Water-Motor Driven Pump Proportioning. {11-2016}	A correctly designed positive displacement water motor in the water supply line coupled to a positive displacement foam concentrate pump to provide proportioning.
Cross Mains. {13-2016}	The pipes supplying the branch lines, either directly or through riser nipples.
Curtain (Rolling Steel Fire Door). {80-2016}	Interlocking curtain slats assembled together.
Daily Frequency. {25-2017}	Occurring every day.
Day Fuel Tank. {110-2016}	A fuel tank, located inside a structure, that provides fuel to the engine.
Dedicated Function Fire Alarm Control Unit. {72-2016}	A protected premises fire alarm control unit that is intended to operate specifically identified emergency control function(s). (SIG-PRO)
Dedicated Function Fire Alarm System. {72-2016}	A protected premises fire alarm system installed specifically to perform emergency control function(s) where a building fire alarm system is not required. (SIG-PRO)
Dedicated Smoke Control System. {92-2015}	Smoke control systems and components that are installed for the sole purpose of providing smoke control and that upon activation of the systems operate specifically to perform the smoke control function.
Delinquency Signal. {72-2016}	A signal indicating a supervisory condition and the need for action in connection with the supervision of guards or system attendants. (SIG-PRO)
Deluge Sprinkler System. {25-2017}	A sprinkler system employing open sprinklers or nozzles that are attached to a piping system that is connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the sprinklers or the nozzles. When this valve opens, water flows into the piping system and discharges from all sprinklers or nozzles attached thereto. [13, 2016]
Deluge Valve. {25-2017}	A water supply control valve intended to be operated by actuation of an automatic detection system that is installed in the same area as the discharge devices.
Design Factor (DF). {2001-2015}	A fraction of the agent minimum design quantity (MDQ) added thereto deemed appropriate due to a specific feature of the protection application or design of the suppression system.
Diesel Engine. {20-2016}	An internal combustion engine in which the fuel is ignited entirely by the heat resulting from the compression of the air supplied for combustion.
Digital Alarm Communicator Receiver (DACR). {72-2016}	A system component that accepts and displays signals from digital alarm communicator transmitters (DACTs) sent over the public switched telephone network. (SIG-SSS)
Digital Alarm Communicator System (DACS). {72-2016}	A system in which signals are transmitted from a digital alarm communicator transmitter (DACT) located at the protected premises through the public-switched telephone network to a digital alarm communicator receiver (DACR). (SIG-SSS)
Digital Alarm Communicator Transmitter (DACT). {72-2016}	A system component at the protected premises to which initiating devices or groups of devices are connected. The DACT seizes the connected telephone line, dials a preselected number to connect to a DACR, and transmits signals indicating a status change of the initiating device. (SIG-SSS)
Digital Alarm Radio Receiver (DARR). {72-2016}	A system component composed of two subcomponents: one that receives and decodes radio signals, the other that annunciates the decoded data. These two subcomponents can be coresident at the central station or separated by means of a data transmission channel. (SIG-SSS)
Digital Alarm Radio System (DARS). {72-2016}	A system in which signals are transmitted from a digital alarm radio transmitter (DART) located at a protected premises through a radio channel to a digital alarm radio receiver (DARR). (SIG-SSS)
Digital Alarm Radio Transmitter (DART). {72-2016}	A system component that is connected to or an integral part of a digital alarm communicator transmitter (DACT) that is used to provide an alternate radio transmission channel. (SIG-SSS)
Direct Injection Variable Pump Output Proportioning. {11-2016}	A direct injection proportioning system that utilizes flowmeters for foam concentrate and water in conjunction with a variable output foam pump control system.
Discharge Device. {25-2017}	A device designed to discharge water or foam-water solution in a predetermined, fixed, or adjustable pattern. Examples include, but are not limited to, sprinklers, spray nozzles, and hose nozzles. [16, 2015]
Display. {72-2016}	The visual representation of output data, other than printed copy. (SIG-NAS)
Door Closer (Swinging). {80-2016}	A labeled device that, where applied to a door and frame, causes an open door to close by mechanical force. The closing speed can be regulated by this device.
Door Holder/Release Device. {80-2016}	A labeled, fail-safe device, controlled by a detection device, used on an automatic closing door to release the door at the time of fire.
Double Check Valve Assembly (DCVA). {25-2017}	This assembly consists of two internally loaded check valves, either springloaded or internally weighted, installed as a unit between two tightly closing resilient-seated shutoff valves as an assembly, and fittings with properly located resilient-seated test cocks. [25, 2016]
Draft Curtain. {92-2015}	A fixed or automatically deployable barrier that protrudes downward from the ceiling to channel, contain, or prevent the migration of smoke.

Drawdown. {20-2016}	The vertical difference between the pumping water level and the static water level.
Dry Barrel Hydrant (Frostproof Hydrant). {25-2017}	A type of hydrant with the main control valve below the frost line between the footpiece and the barrel.
Dry Chemical System. {17-2017}	A means of applying dry chemical that can be automatically or manually activated to discharge through a distribution system onto or into the protected hazard. The system includes auxiliary equipment.
Dry Chemical. {10-2018}	A powder composed of very small particles, usually sodium bicarbonate-, potassium bicarbonate-, or ammonium phosphate-based with added particulate material supplemented by special treatment to provide resistance to packing, resistance to moisture absorption (caking), and the proper flow capabilities. [17, 2017]
Dry Pipe Sprinkler System. {25-2017}	A sprinkler system employing automatic sprinklers that are attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a sprinkler) permits the water pressure to open a valve known as a dry pipe valve, and the water then flows into the piping system and out the opened sprinklers. [13, 2016]
Dry Powder. {10-2018}	Solid materials in powder or granular form designed to extinguish Class D combustible metal fires by crusting, smothering, or heat-transferring means.
Dry Sprinkler. {13-2016}	A sprinkler secured in an extension nipple that has a seal at the inlet end to prevent water from entering the nipple until the sprinkler operates.
Dry Standpipe. {25-2017}	A standpipe system designed to have piping contain water only when the system is being utilized.
Dump Valve. {20-2016}	An automatic valve installed on the discharge side of a positive displacement pump to relieve pressure prior to the pump driver reaching operating speed.
Dynamic System. {80-2016}	An HVAC system designed to maintain the movement of air within the system at the indication of a fire.
Early Suppression Fast-Response (ESFR) Sprinkler. {25-2017}	A type of fast-response sprinkler that has a thermal element with an RTI of 50 (meters-seconds)1/2 or less and is listed for its capability to provide fire suppression of specific high-challenge fire hazards. [13, 2016]
Eductor (Inductor). {11-2016}	A device that uses the Venturi principle to introduce a proportionate quantity of foam concentrate into a water stream; the pressure at the throat is below atmospheric pressure and will draw in liquid from atmospheric storage.
Egress Side. {80-2016}	The side of an opening from which traffic exits.
Electric Strike. {80-2016}	A strike that, when activated, either releases or retains a projected latch or dead bolt.
Electrical Conductivity Heat Detector. {72-2016}	A line-type or spot-type sensing element in which resistance varies as a function of temperature. (SIG-IDS)
Electronic Monitoring. {10-2018}	Either a local alarm device to indicate when an extinguisher is removed from its designated location or a method of electronic communication (data transmission) between an in-place fire extinguisher and an electronic monitoring device/system.
Emergency Communications System — Emergency Command Center. {72-2016}	The room(s) or area(s) staffed during any emergency event by assigned emergency management staff. The room or area contains system communications and control equipment serving one or more buildings where responsible authorities receive information from premises sources or systems or from (higher level) regional or national sources or systems and then disseminate appropriate information to individuals, a building, multiple buildings, outside campus areas, or a combination of these in accordance with the emergency response plan established for the premises. The room or area contains the controls and indicators from which the ECS systems located in the room or area can be manually controlled as required by the emergency response plan and the emergency management coordinator. (SIG-ECS)
Emergency Communications System. {72-2016}	A system for the protection of life by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action. (SIG-ECS)
Emergency Communications Systems — Combination. {72-2016}	Various emergency communication systems such as fire alarm, mass notification, fire fighter communications, area of refuge communications, elevator communications, or others that can be served through a single control system or through an interconnection of several control systems. (SIG-ECS)
Emergency Impairment. {25-2017}	A condition where a water-based fire protection system or portion thereof is out of order due to an unplanned occurrence, or the impairment is found while performing inspection testing or maintenance activities.
Emergency Power Supply (EPS). {110-2016}	The source of electric power of the required capacity and quality for an emergency power supply system (EPSS).
Emergency Power Supply System (EPSS). {110-2016}	A complete functioning EPS system coupled to a system of conductors, disconnecting means and overcurrent protective devices, transfer switches, and all control, supervisory, and support devices up to and including the load terminals of the transfer equipment needed for the system to operate as a safe and reliable source of electric power.
Enclosed Fuel Tank. {110-2016}	A fuel tank located within a separate room, separated from other equipment.

End Suction Pump. {20-2016}	A single suction pump having its suction nozzle on the opposite side of the casing from the stuffing box and having the face of the suction nozzle perpendicular to the longitudinal axis of the shaft.
Energy Conversion Equipment (ECE). {111-2013}	A system of either a UPS, a battery bank and battery charger (central battery system), or a rotating motor generator (with or without inertia flywheel), often supplied by a central battery system power source.
Engine Speed. {20-2016}	The speed indicated on the engine nameplate.
Engineered Systems. {17-2017}	Those systems requiring individual calculation and design to determine the flow rates, nozzle pressures, pipe size, area, or volume protected by each nozzle, quantities of dry chemical, number and types of nozzles, and their placement in a specific system.
Evacuation Signal. {72-2016}	A distinctive alarm signal intended to be recognized by the occupants as requiring evacuation of the building. (SIG-PRO)
Evacuation. {72-2016}	The withdrawal of occupants from a building. (SIG-PRO)
Executive Software. {72-2016}	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)
Exit Access. {1-2015}	That portion of a means of egress that leads to an exit. [101, 2015]
Exit Discharge. {1-2015}	That portion of a means of egress between the termination of an exit and a public way. [101, 2015]
Exit Marking Audible Notification Appliance. {72-2016}	An audible notification appliance that marks building exits and areas of refuge by the sense of hearing for the purpose of evacuation or relocation. (SIG-NAS)
Exit. {1-2015}	That portion of a means of egress that is separated from all other spaces of a building or structure by construction, location, or equipment as required to provide a protected way of travel to the exit discharge. [101, 2015]
Expellant Gas. {17-2017}	The medium used to discharge extinguishing agent from its container. [17A, 2017]
Extended Coverage Sprinkler. {25-2017}	A type of spray sprinkler with maximum coverage areas as specified in Sections 8.8 and 8.9 of NFPA 13. [13, 2016]
Extinguisher Bracket. {10-2018}	Extinguisher retention device designed to mount and secure a specific extinguisher model onto various surfaces by incorporating releasable straps or bands to secure the fire extinguisher.
Extinguisher Cabinet. {10-2018}	An identifiable and readily accessible fire extinguisher housing device designed to store and protect fire equipment.
Extinguisher Hanger. {10-2018}	Extinguisher mounting device designed for mounting a specific extinguisher model onto stationary vertical surfaces.
Extinguisher Inspection. {10-2018}	A quick check that a fire extinguisher is in its designated place, that it has not been actuated or tampered with, and that there is no obvious physical damage or condition to prevent its operation.
Extinguisher Maintenance. {10-2018}	A thorough examination of the fire extinguisher that is intended to give maximum assurance that a fire extinguisher will operate effectively and safely and to determine if physical damage or condition will prevent its operation, if any repair or replacement is necessary, and if hydrostatic testing or internal maintenance is required.
Extinguisher Service Pressure. {10-2018}	The normal operating pressure as indicated on the nameplate or cylinder of a fire extinguisher.
Factory Test Pressure. {10-2018}	The pressure shown on the nameplate at which a shell was tested at time of manufacture.
Fail-Safe Device. {80-2016}	A device that will provide its intended function upon loss of power.
Feed Mains. {13-2016}	The pipes supplying cross mains, either directly or through risers.
Field Modifications. {80-2016}	Changes, not otherwise permitted by this standard, made to a listed assembly or component after it has been manufactured.
Film-Forming Fluoroprotein Foam (FFFP). {10-2018}	A protein-foam solution that uses fluorinated surfactants to produce a fluid aqueous film for suppressing liquid fuel vapors.
Film-Forming Fluoroprotein Foam Concentrate (FFFP). {16-2015}	A protein-foam concentrate that uses fluorinated surfactants to produce a fluid aqueous film for suppressing hydrocarbon fuel vapors. [11, 2010]
Film-Forming Foam. {11-2016}	A concentrate that when mixed at its nominal use concentration will form an aqueous film on hydrocarbon fuels.
Fire Alarm Control Unit (FACU). {72-2016}	A component of the fire alarm system, provided with primary and secondary power sources, which receives signals from initiating devices or other fire alarm control units, and processes these signals to determine part or all of the required fire alarm system output function(s). (SIG-PRO)
Fire Alarm Signal. {72-2016}	A signal that results from the manual or automatic detection of a fire alarm condition. (SIG-FUN)

Fire Alarm System. {72-2016}	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. (SIG-FUN)
Fire Alarm/Evacuation Signal Tone Generator. {72-2016}	A device that produces a fire alarm/evacuation tone upon command. (SIG-PRO)
Fire Command Center. {72-2016}	The principal attended or unattended room or area where the status of the detection, alarm communications, control systems, and other emergency systems is displayed and from which the system(s) can be manually controlled. (SIG-ECS)
Fire Damper. {80-2016}	A device installed in an air distribution system, designed to close automatically upon detection of heat, to interrupt migratory airflow and to restrict the passage of flame. Fire dampers are classified for use in either static systems or for dynamic systems, where the dampers are rated for closure under airflow.
Fire Department Connection. {25-2017}	A connection through which the fire department can pump supplemental water into the sprinkler system, standpipe, or other system furnishing water for fire extinguishment to supplement existing water supplies.
Fire Door Assembly. {80-2016}	Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.
Fire Door Frame for Lights. {80-2016}	A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials.
Fire Door Frame for Panels. {80-2016}	A frame that, in addition to a door opening, contains an opening(s) for use with fixed panels of solid metal or wood.
Fire Door Frame. {80-2016}	A component forming the perimeter of an opening in a fire door assembly that is supplied welded or knocked down and anchored to the surrounding structure.
Fire Door Hardware. {80-2016}	Door hardware furnished for swinging and sliding fire doors by the door manufacturer as a component part of the listed door assembly.
Fire Door. {80-2016}	The door component of a fire door assembly.
Fire Exit Hardware. {80-2016}	Labeled devices for swinging fire doors installed to facilitate safe egress of persons and generally consisting of a crossbar and various types of latch mechanisms that cannot hold the latch in a retracted locked position.
Fire Extinguisher Electronic Monitoring Device. {72-2016}	A device connected to a control unit that monitors the fire extinguisher in accordance with the requirements of NFPA 10. (SIG-IDS)
Fire Hydrant. {25-2017}	A valved connection on a water supply system having one or more outlets and that is used to supply hose and fire department pumpers with water. [1141, 2017]
Fire Protection Glazing. {80-2016}	Glazing that has a fire protection rating.
Fire Protection Rating. {80-2016}	For the purposes of this standard, the designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252 or NFPA 257 respectively. (See also Annex D.)
Fire Protection System. {1-2018}	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. [1141, 2017]
Fire Protective Curtain Assembly. {80-2016}	An assembly typically consisting of a fabric curtain, a bottom bar, guides, a coil, and an operating and closing system.
Fire Pump Alarm. {20-2016}	A supervisory signal indicating an abnormal condition requiring immediate attention.
Fire Pump Controller. {20-2016}	A group of devices that serve to govern, in some predetermined manner, the starting and stopping of the fire pump driver and to monitor and signal the status and condition of the fire pump unit.
Fire Pump Discharge Pressure. {25-2017}	The total pressure available at the pump discharge flange. [20, 2016]
Fire Pump Net Pressure (Differential Pressure). {25-2017}	For vertical turbine fire pumps the total pressure at the pump discharge flange plus the total suction lift. For other fire pumps, the total pressure at the fire pump discharge flange minus the total pressure at the fire pump suction flange. [20, 2016]
Fire Pump No Flow (Churn, Shutoff). {25-2017}	The condition of zero flow when the fire pump is running but the only water passing through the pump is a small flow that is discharged through the pump circulation relief valve or supplies the cooling for a diesel engine driver. [20, 2016]
Fire Pump Peak Load. {25-2017}	As pertains to acceptance testing in this standard is the maximum power required to drive the pump at any flow rate up to 150 percent of rated capacity (flow). [20, 2016]
Fire Pump Rated Flow. {25-2017}	The capacity of the pump at rated speed and rated pressure as marked on the manufacturer's name plate. [20, 2016]
Fire Pump Rated Pressure. {25-2017}	The net pressure (differential pressure) at rated flow and rated speed as marked on the manufacturer's nameplate. [20, 2016]
Fire Pump Suction Pressure. {25-2017}	The total pressure available at the pump suction flange. [20, 2016]

Fire Pump Unadjusted Field Test Curve. {25-2017}	A fire pump discharge curve including churn, 100 percent rate flow, and maximum flow up to 150 percent of rated flow, based on discharge gauge readings without speed or velocity pressure adjustments.
Fire Pump Unit. {20-2016}	An assembled unit consisting of a fire pump, driver, controller, and accessories.
Fire Pump. {25-2017}	A pump that is a provider of liquid flow and pressure dedicated to fire protection. [20, 2016]
Fire Resistance Glazing. {80-2016}	Glazing that has a fire resistance rating.
Fire Resistance Rating. {80-2016}	The time, in minutes or hours, that materials or assemblies have withstood a fire exposure as established in accordance with the test procedures of ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials or ANSI/UL 263, Standard for Fire Tests of Building Construction and Materials.
Fire Safety Curtain Assembly. {80-2016}	A fire safety curtain and all other components necessary to form a complete assembly.
Fire Safety Curtain. {80-2016}	A curtain of fire-resistant fabric and noncombustible framing materials.
Fire Shutter. {80-2016}	A fire door assembly used for the protection of a window opening in an exterior wall.
Fire Window Assembly. {80-2016}	A window or glass block assembly having a fire protection rating.
Fire–Gas Detector. {72-2016}	A device that detects gases produced by a fire. (SIG-IDS)
FireWarning Equipment. {72-2016}	Any detector, alarm, device, or material related to single- and multiple-station alarms or household fire alarm systems. (SIG-HOU)
Five Years Frequency. {25-2017}	Occurring once every 60 months with a minimum of 54 months and a maximum of 66 months.
Fixed Foam Discharge Outlet. {11-2016}	A device permanently attached to a tank, dike, or other containment structure, designed to introduce foam.
Fixed Monitor (Cannon). {11-2016}	A device that delivers a large foam stream and is mounted on a stationary support that either is elevated or is at grade.
Fixed System. {11-2016}	A complete installation in which foam is piped from a central foam station, discharging through fixed delivery outlets to the hazard to be protected with permanently installed pumps where required.
Fixed-Temperature Detector. {72-2016}	A device that responds when its operating element becomes heated to a predetermined level. (SIG-IDS)
Flame Detector Sensitivity. {72-2016}	The distance along the optical axis of the detector at which the detector can detect a fire of specified size and fuel within a given time frame. (SIG-IDS)
Flame Detector. {72-2016}	A radiant energy–sensing fire detector that detects the radiant energy emitted by a flame. (Refer to A.17.8.2.) (SIG-IDS)
Floor Fire Door Assembly. {80-2016}	A combination of a fire door, a frame, hardware, and other accessories installed in a horizontal plane that together provide a specific degree of fire protection to a through-opening in a fire resistance–rated floor.
Flow Hydrant. {13-2016}	The hydrant that is used for the flow and flow measurement of water during a flow test. [24, 2013]
Flow Test. {13-2016}	A test performed by the flow and measurement of water from one hydrant and the static and residual pressures from an adjacent hydrant for the purpose of determining the available water supply at that location. [24, 2013]
Fluoroprotein Foam Concentrate. {16-2015}	A concentrate very similar to protein-foam concentrate but with a synthetic fluorinated surfactant additive. [11, 2010]
Flush Sprinkler. {25-2017}	A sprinkler in which all or part of the body, including the shank thread, is mounted above the lower plane of the ceiling. [13, 2016]
Flushing Test. {13-2016}	A test of a piping system using flowrates intended to remove debris from the piping system prior to it being placed in service. [24,2016]
Foam Chamber. {11-2016}	See 3.3.4.1, Fixed Foam Discharge Outlet.
Foam Concentrate Type. {11-2016}	A classification of a foam concentrate that includes the chemical composition as defined under foam concentrate (see 3.3.12), including the use percentage, the minimum usable temperature, and the fuels on which the concentrate is effective.
Foam Concentrate. {25-2017}	A concentrated liquid foaming agent as received from the manufacturer. [11, 2016]
Foam Discharge Device. {25-2017}	A device designed to discharge water or foam-water solution in a predetermined, fixed, or adjustable pattern. Examples include, but are not limited to, sprinklers, spray nozzles, and hose nozzles. [16, 2015]

Foam Generators — Aspirator Type. {11-2016}	Foam generators, fixed or portable, in which jet streams of foam solution aspirate sufficient amounts of air that is then entrained on the screens to produce foam, and which usually produce foam with expansion ratios of not more than 250:1.
Foam Generators — Blower Type. {11-2016}	Foam generators, fixed or portable, in which the foam solution is discharged as a spray onto screens through which an airstream developed by a fan or blower is passing.
Foam Nozzle or Fixed Foam Maker. {11-2016}	A specially designed hoseline nozzle or fixed foam maker designed to aspirate air that is connected to a supply of foam solution.
Foam Solution. {16-2015}	A homogeneous mixture of water and foam concentrate in the correct proportions. [11, 2010]
Foam. {16-2015}	A stable aggregation of bubbles of lower density than oil or water. [11, 2010]
Foam-Generating Methods. {11-2016}	Methods of generation of air foam including hose stream, foam nozzle, and medium- and high-expansion generators, foam maker, pressure foam maker (high back pressure or forcing type), or foam monitor stream.
Foam-Water Deluge System. {16-2015}	A foam-water sprinkler system employing open discharge devices, which are attached to a piping system that is connected to a water supply through a valve that is opened by the operation of a detection system, which is installed in the same areas as the discharge devices.
Foam-Water Density. {16-2015}	The unit rate of foam-water solution application to an area, expressed in [L/min·m2 (gpm/ft2)].
Foam-Water Dry Pipe System. {16-2015}	A foam-water sprinkler system employing automatic sprinklers or nozzles that are attached to a piping system that contains air or nitrogen under pressure, the release of which (as from the opening of a sprinkler) permits the water pressure to open a valve known as a dry pipe valve.
Foam-Water Preaction System. {16-2015}	A foam-water sprinkler system employing automatic sprinklers or nozzles attached to a piping system containing air that might or might not be under pressure, with a supplemental detection system installed in the same area as the sprinklers.
Foam-Water Spray System. {25-2017}	A foam-water sprinkler system designed to use nozzles rather than sprinklers. [16, 2015]
Foam-Water Sprinkler System. {25-2017}	A piping network employing automatic sprinklers, nozzles or other discharge devices, connected to a source of foam concentrate and to a water supply. [16, 2015]
Framed Fire Safety Curtain Assembly. {80-2016}	A straight lift–type fire safety curtain assembly containing a rigid perimeter frame and internal members.
Fusible Link. {80-2016}	For the purposes of this standard, a listed device consisting of pieces of metal held together by low-melting-point solder.
Gas Detector. {72-2016}	A device that detects the presence of a specified gas concentration. Gas detectors can be either spot-type or line-type detectors. (SIG-IDS)
Gear Pump. {20-2016}	A positive displacement pump characterized by the use of gear teeth and casing to displace liquid.
Governor (Sliding, Vertical, and Rolling Steel Fire Doors). {80-2016}	A device that limits the rate of descent of the door during automatic closure.
Gridded Sprinkler System. {13-2016}	A sprinkler system in which parallel cross mains are connected by multiple branch lines, causing an operating sprinkler to receive water from both ends of its branch line while other branch lines help transfer water between cross mains.
Guide (Rolling Doors). {80-2016}	Vertical assembly in which the curtain travels and that is fastened to the jamb, retaining the edges of the door curtain, and closing the space between the curtain, edges, and the jamb.
Guide Rail (Sliding Door, Vertical). {80-2016}	A steel member attached to the wall or frame; used with vertical sliding doors to guide the door.
Halocarbons. {10-2018}	Halocarbon agents include hydrochlorofluorocarbon (HCFC), hydrofluorocarbon (HFC), perfluorocarbon (PFC), fluoroiodocarbon (FIC) types of agents, and other halocarbons that are found acceptable under the Environmental Protection Agency Significant New Alternatives Policy program.
Halons. {10-2018}	Halons include bromochlorodifluoromethane (Halon 1211), bromotrifluoromethane (Halon 1301), and mixtures of Halon 1211 and Halon 1301 (Halon 1211/1301).
Hanger. {13-2016}	A device or assembly used to support the gravity load of the system piping.
Head. {20-2016}	A quantity used to express a form (or combination of forms) of the energy content of water per unit weight of the water referred to any arbitrary datum.
Heat Detector. {72-2016}	A fire detector that detects either abnormally high temperature or rate-of-temperature rise, or both. (SIG-IDS)
Heat-Actuated Device. {80-2016}	Devices that include fixed temperature releases, rate-of-temperature-rise releases, and door closers with hold-open arms embodying a fusible link.
High Pressure. {12-2015}	Indicates that the carbon dioxide is stored in pressure containers at ambient temperatures.

Hood (Rolling Steel Door). {80-2016}	A sheet metal housing that mounts horizontally between the brackets, serving as an enclosure for the coiled curtain and closing the space between the door coil and the lintel.
Horizontal Access Door. {80-2016}	An access door installed in the horizontal plane used to protect openings in ceilings of fire resistance–rated floor–ceiling or roof–ceiling assemblies.
Horizontal Exit. {1-2015}	A way of passage from one building to an area of refuge in another building on approximately the same level, or a way of passage through or around a fire barrier to an area of refuge on approximately the same level in the same building that affords safety from fire and smoke originating from the area of incidence and areas communicating therewith. [101, 2015]
Horizontal Pump. {20-2016}	A pump with the shaft normally in a horizontal position.
Horizontal Rack. {25-2017}	A hose rack where the hose is connected to the valve, then stack-folded horizontally to the top of the rack.
Horizontal Split-Case Pump. {20-2016}	A centrifugal pump characterized by a housing that is split parallel to the shaft.
Hose Connection. {25-2017}	A combination of equipment provided for connection of a hose to the standpipe system that includes a hose valve with a threaded outlet. [14, 2016]
Hose House. {25-2017}	An enclosure located over or adjacent to a hydrant or other water supply designed to contain the necessary hose nozzles, hose wrenches, gaskets, and spanners to be used in fire fighting in conjunction with and to provide aid to the local fire department.
Hose Nozzle. {25-2017}	A device intended for discharging water for manual suppression or extinguishment of a fire.
Hose Reel. {25-2017}	A circular device used to store hose.
Hose Station. {25-2017}	A combination of a hose rack or reel, hose nozzle, hose, and hose connection. [14, 2016]
Hose Valve. {25-2017}	The valve to an individual hose connection. [14, 2016]
Hydraulically Designed System. {13-2016}	A calculated sprinkler system in which pipe sizes are selected on a pressure loss basis to provide a prescribed water density, in gallons per minute per square foot (mm/min), or a prescribed minimum discharge pressure or flow per sprinkler, distributed with a reasonable degree of uniformity over a specified area.
Hydrostatic Test. {25-2017}	A test of a closed piping system and its attached appurtenances consisting of subjecting the piping to an increased internal pressure for a specified duration to verify system integrity and system leakage rates. [24, 2016]
Hydrostatic Testing. {10-2018}	Pressure testing of the extinguisher to verify its strength against unwanted rupture.
Impairment. {25-2017}	A condition where a fire protection system or unit or portion thereof is out of order, and the condition can result in the fire protection system or unit not functioning in a fire event.
Inactive Leaf. {80-2016}	One door of a pair of doors that ordinarily is latched closed; the second operating door of a pair.
In-Building Fire Emergency Voice/Alarm Communications System. {72-2016}	Dedicated manual or automatic equipment for originating and distributing voice instructions, as well as alert and evacuation signals pertaining to a fire emergency, to the occupants of a building. (SIG-ECS)
In-Building Mass Notification System. {72-2016}	A system used to provide information and instructions to people in a building(s) or other space using intelligible voice communications and including visible signals, text, graphics, tactile, or other communication methods. (SIG-ECS)
Indicating Valve. {13-2016}	A valve that has components that provide the valve operating position, open or closed. [24,2016]
Indicator. {17-2017}	A mechanical or electrical device that shows when an extinguishing system or a critical component of it is ready to operate or if it has already operated.
Initiating Device Circuit. {72-2016}	A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated. (SIG-PRO)
Initiating Device. {72-2016}	A system component that originates transmission of a change-of-state condition, such as in a smoke detector, manual fire alarm box, or supervisory switch. (SIG-IDS)
In-Line Balanced Pressure Proportioner. {25-2017}	A system that is similar to a standard balanced pressure system, except the pumped concentrate pressure is maintained at a fixed preset value.
In-Line Balanced Pressure Proportioning. {11-2016}	A foam proportioning system utilizing a foam concentrate pump or a bladder tank in conjunction with a listed pressure reducing valve. At all design flow rates, the constant foam concentrate pressure is greater than the maximum water pressure at the inlet to the in-line balanced pressure proportioner. A pressure balancing valve integral to the in-line balanced pressure proportioner regulates the foam concentrate pressure to be balanced to incoming water pressure.
In-Line Eductor. {11-2016}	A Venturi-type proportioning device that meters foam concentrate at a fixed or variable concentration into the water stream at a point between the water source and a nozzle or other discharge device.
In-Line Pump. {20-2016}	A centrifugal pump whose drive unit is supported by the pump having its suction and discharge flanges on approximately the same centerline.

Inspection, Testing, and Maintenance Service. {25-2017}	A service program provided by a qualified contractor or qualified property owner's representative in which all components unique to the property's systems are inspected and tested at the required times and necessary maintenance is provided.
Inspection. {25-2017}	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. [820, 2016]
Integral Fuel Tank in EPS Systems. {110-2016}	A fuel tank furnished by the EPS supplier and mounted on the engine or under as a subbase.
Intermediate Level Sprinkler/Rack Storage Sprinkler. {13-2016}	A sprinkler equipped with integral shields to protect its operating elements from the discharge of sprinklers installed at higher elevations.
Internal Combustion Engine. {20-2016}	Any engine in which the working medium consists of the products of combustion of the air and fuel supplied.
Ionization Smoke Detection. {72-2016}	The principle of using a small amount of radioactive material to ionize the air between two differentially charged electrodes to sense the presence of smoke particles. Smoke particles entering the ionization volume decrease the conductance of the air by reducing ion mobility. The reduced conductance signal is processed and used to convey an alarm condition when it meets preset criteria. (SIG-IDS)
Isolating Switch. {20-2016}	A switch intended for isolating an electric circuit from its source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.
Latching Device. {80-2016}	A spring-loaded latch bolt or a gravity-operated steel bar that, after release by physical action, returns to its operating position and automatically engages the strike plate when it is returned to the closed position.
Life Safety Systems	Those systems that enhance or facilitate evacuation, smoke control, compartmentalization, and/or isolation. [1031, 2014]
Line Proportioner. {25-2017}	A system that uses a venturi pickup-type device where water passing through the unit creates a vacuum, thereby allowing foam concentrate to be picked up from an atmospheric storage container.
Line-Type Detector. {72-2016}	A device in which detection is continuous along a path. Typical examples are rate-of-rise pneumatic tubing detectors, projected beam smoke detectors, and heat-sensitive cable. (SIG-IDS)
Listed. {25-2017}	Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.
Loaded Stream Charge. {10-2018}	A water-based extinguishing agent that uses an alkali metal salt as a freezing point depressant.
Local Application System. {17-2017}	A supply of dry chemical permanently connected to fixed piping with nozzles arranged to discharge directly onto the fire.
Looped Sprinkler System. {13-2016}	A sprinkler system in which multiple cross mains are tied together so as to provide more than one path for water to flow to an operating sprinkler and branch lines are not tied together.
Loss of Phase. {20-2016}	The loss of one or more, but not all, phases of the polyphase power source.
Loss of Power. {72-2016}	The reduction of available voltage at the load below the point at which equipment can function as designed. (SIG-FUN)
Low Pressure. {12-2015}	Indicates that the carbon dioxide is stored in pressure containers at a controlled low temperature of 0°F (−18°C).
Low-Power Radio Transmitter/Transceiver. {72-2016}	Any device that communicates with associated control/receiving equipment or other transceivers by low-power radio signals. (SIG-PRO)
Lumps. {17-2017}	Agglomerations of dry chemical that do not crumble into particles when dropped from a height of 4 in. (101 mm) onto a hard surface.
Main Drain. {25-2017}	The primary drain connection located on the system riser.
Main Fuel Tank. {110-2016}	A separate, main fuel tank for supplying fuel to the engine or a day tank.
Maintenance. {25-2017}	In water-based fire protection systems, work performed to keep equipment operable.
Maintenance. {72-2016}	Work, including, but not limited to, repair, replacement, and service, performed to ensure that equipment operates properly. (SIG-TMS)
Malicious Alarm. {72-2016}	An unwanted activation of an alarm initiating device caused by a person acting with malice. (SIG-FUN)

Manual Dry Standpipe System. {14-2016}	A standpipe system with no permanently attached water supply that relies exclusively on the fire department connection to supply the system demand.
Manual Fire Alarm Box. {72-2016}	A manually operated device used to initiate a fire alarm signal. (SIG-IDS)
Manual Flush Bolts. {80-2016}	A mortised bolt installed near the top or bottom of the inactive leaf of a pair of doors in which the bolts are manually extended or retracted into or out of the header or sill by means of a lever.
Manual Operation. {25-2017}	Operation of a system or its components through human action.
Manual Standpipe. {25-2017}	Standpipe system that relies exclusively on the fire department connection to supply the system demand.
Manual Transfer Switch. {20-2016}	A switch operated by direct manpower for transferring one or more load conductor connections from one power source to another.
Manual Wet Standpipe System. {14-2016}	A standpipe system containing water at all times that relies exclusively on the fire department connection to supply the system demand.
Manufacturer's Design, Installation, and Maintenance Manual. {17-2017}	The document referenced for the design, installation, and maintenance of the listed dry chemical extinguishing system equipment.
Master Fire Alarm Control Unit. {72-2016}	A fire alarm control unit that serves the protected premises or portion of the protected premises as a local fire alarm control unit and accepts inputs from other fire alarm control units. (SIG-PRO)
Master Pressure-Reducing Valve. {25-2017}	A pressure reducing valve installed to regulate pressures in an entire fire protection system and/or standpipe system zone.
Means of Egress. {1-2015}	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. [101, 2015]
Medium- and High-Expansion Foam Concentrate. {16-2015}	A concentrate, usually derived from hydrocarbon surfactants, used in specially designed equipment to produce foams having foam-to-solution volume ratios of 20:1 to approximately 1000:1. [11, 2010]
Mild Steel Shell. {10-2018}	All steel shells other than stainless steel and steel shells used for high-pressure cylinders.
Mobile System. {11-2016}	Any type of foam-producing unit that is mounted on wheels and that is self-propelled or towed by a vehicle and can be connected to a water supply or can utilize a premixed foam solution.
Monitor Nozzle Hydrant. {25-2017}	A hydrant equipped with a monitor nozzle capable of delivering more than 250 gpm (946 L/min).
Monitor Nozzle. {25-2017}	A permanently mounted device specifically designed with a high flow rate to provide a farreaching stream for locations where large amounts of water need to be available without the delay of laying hose lines.
Monthly Frequency. {25-2017}	Occurring once per calendar month.
Motor Speed. {20-2016}	The speed indicated on the motor nameplate.
Mullion. {80-2016}	A fixed or removable vertical member set in a double door opening that allows both leaves to be active or set between a door and a side light or a separate, framed, glazed area.
Multi-Criteria Detector. {72-2016}	A device that contains multiple sensors that separately respond to physical stimulus such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. This sensor is capable of generating only one alarm signal from the sensors employed in the design either independently or in combination. The sensor output signal is mathematically evaluated to determine when an alarm signal is warranted. The evaluation can be performed either at the detector or at the control unit. This detector has a single listing that establishes the primary function of the detector. (SIG-IDS)
Multiplexing. {72-2016}	A signaling method characterized by simultaneous or sequential transmission, or both, and reception of multiple signals on a signaling line circuit, a transmission channel, or a communications channel, including means for positively identifying each signal. (SIG-SSS)
Multipurpose Dry Chemical. {17-2017}	Ammonium phosphate–based extinguishing agent that is effective on fires involving ordinary combustibles, such as wood or paper, and fires involving flammable liquids.
Multi-Sensor Detector. {72-2016}	A device that contains multiple sensors that separately respond to physical stimulus such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. A device capable of generating multiple alarm signals from any one of the sensors employed in the design, independently or in combination. The sensor output signals are mathematically evaluated to determine when an alarm signal is warranted. The evaluation can be performed either at the detector or at the control unit. This device has listings for each sensing method employed. (SIG-IDS)

Multistage Multiport Pump. {20-2016}	A single-driver pump with multiple impellers operating in series where the discharge from each impeller, except the last impeller, is the suction for the next impeller, and discharge ports are provided after multiple impellers.
Municipal Fire Alarm Box (Street Box). {72-2016}	A publicly accessible alarm box. (See 3.3.12, Alarm Box.)
Non-Air-Aspirating Discharge Devices. {11-2016}	Devices designed to provide a specific water discharge pattern.
Nonautomatic Transfer Switch. {110-2016}	A device, operated manually by a physical action or electrically by either a local or remote control, for transferring a common load between a normal and alternate supply.
Noncontinuous Obstruction. {13-2016}	An obstruction at or below the level of the sprinkler deflector that affects the discharge pattern of a single sprinkler.
Nondedicated Smoke Control Systems. {92-2015}	A smoke control system that shares components with some other system(s), such as the building HVAC system, which changes its mode of operation to achieve the smoke control objective. [1, 2015]
Nonrechargeable (Nonrefillable) Fire Extinguisher. {10-2018}	A fire extinguisher that is intended to be used one time and not capable of or intended to be recharged and returned to service.
Nonrequired. {72-2016}	A system component or group of components that is installed at the option of the owner, and is not installed due to a building or fire code requirement. (SIG-FUN)
Nonrestorable Initiating Device. {72-2016}	A device in which the sensing element is designed to be destroyed in the process of operation. (SIG-IDS)
Normal Condition. {72-2016}	Circuits, systems, and components are functioning as designed and no abnormal condition exists. (SIG-FUN)
Normally Occupied Enclosure or Space. {12-2015}	An enclosure or space where one or more persons are present under normal circumstances.
Normally Unoccupied Enclosure or Space. {12-2015}	An enclosure or space not normally occupied but one that could be entered occasionally by one or more persons for brief periods.
Notification Appliance. {72-2016}	A fire alarm system component such as a bell, horn, speaker, light, or text display that provides audible, tactile, or visible outputs, or any combination thereof. (SIG-NAS)
Nozzles. {25-2017}	A device for use in applications requiring special water discharge patterns, directional spray, or other unusual discharge characteristics. [13, 2016]
Nuisance Alarm. {72-2016}	An unwanted activation of a signaling system or an alarm initiating device in response to a stimulus or condition that is not the result of a potentially hazardous condition. (SIG-FUN)
Occupiable Enclosure or Space. {12-2015}	An enclosure or space that has dimensions and physical characteristics such that it could be entered by a person.
Old-Style/Conventional Sprinkler. {25-2017}	A sprinkler that directs from 40 percent to 60 percent of the total water initially in a downward direction and that is designed to be installed with the deflector either upright or pendent. [13, 2016]
One-Way Emergency Communications System. {72-2016}	One way emergency communications systems are intended to broadcast information, in an emergency, to people in one or more specified indoor or outdoor areas. It is intended that emergency messages be conveyed either by audible, visible, or textual means, or any combination thereof. (SIG-ECS)
Open Back Strike. {80-2016}	A strike applied to the inactive leaf of a pair of doors and cut away at the back to allow either leaf to open or close independently.
Open Sprinkler. {25-2017}	A sprinkler that does not have actuators or heat-responsive elements. [13, 2016]
Operating Devices. {17-2017}	Mechanical, electrical, or pneumatic devices involved in the operation of a system. [17A, 2017]
Orifice Plate Proportioning. {25-2017}	This system utilizes an orifice plate(s) through which passes a specific amount of foam concentrate at a specific pressure drop across the orifice plate(s).
Ornamental/Decorative Sprinkler. {25-2017}	A sprinkler that has been painted or plated by the manufacturer. [13, 2016]
Other Fire Detectors. {72-2016}	Devices that detect a phenomenon other than heat, smoke, flame, or gases produced by a fire. (SIG-IDS)
Other Synthetic Foam Concentrate. {16-2015}	A concentrate based on hydrocarbon surface active agents and listed as a wetting agent, foaming agent, or both. [11, 2010]
Owner's Manual. {17-2017}	A pamphlet containing the manufacturer's recommendations for the proper inspection and operation of the extinguishing system.
Packaged Fire Pump Assembly. {20-2016}	Fire pump unit components assembled at a packaging facility and shipped as a unit to the installation site. The scope of listed components (where required to be listed by this standard) in a preassembled package includes the pump, driver, controller, and other accessories identified by the packager assembled onto a base with or without an enclosure.
Paging System. {72-2016}	A system intended to page one or more persons by such means as voice over loudspeaker, coded audible signals or visible signals, or lamp annunciators. (SIG-PRO)
Pass Door. {80-2016}	A swinging door in a sliding door for personnel use.

Passive Fire Protection System.	Any portion of a building or structure that provides protection from fire or smoke without any type of system activation or movement. [3, 2018]
Pendent Sprinkler. {25-2017}	A sprinkler designed to be installed in such a way that the water stream is directed downward against the deflector. [13, 2016]
Performance-Based Program. {25-2017}	Methods and frequencies that have been demonstrated to deliver equivalent or superior levels of performance through quantitative performance-based analysis.
Photoelectric Light Obscuration Smoke Detection. {72-2016}	The principle of using a light source and a photosensitive sensor onto which the principal portion of the source emissions is focused. When smoke particles enter the light path, some of the light is scattered and some is absorbed, thereby reducing the light reaching the receiving sensor. The light reduction signal is processed and used to convey an alarm condition when it meets preset criteria. (SIG-IDS)
Photoelectric Light-Scattering Smoke Detection. {72-2016}	The principle of using a light source and a photosensitive sensor arranged so that the rays from the light source do not normally fall onto the photosensitive sensor. When smoke particles enter the light path, some of the light is scattered by reflection and refraction onto the sensor. The light signal is processed and used to convey an alarm condition when it meets preset criteria. (SIG-IDS)
Pipe Schedule System. {13-2016}	A sprinkler system in which the pipe sizing is selected from a schedule that is determined by the occupancy classification and in which a given number of sprinklers are allowed to be supplied from specific sizes of pipe.
Piston Plunger Pump. {20-2016}	A positive displacement pump characterized by the use of a piston or plunger and a cylinder to displace liquid.
Pneumatic Rate-of-Rise Tubing Heat Detector. {72-2016}	A line-type detector comprising small-diameter tubing, usually copper, that is installed on the ceiling or high on the walls throughout the protected area. The tubing is terminated in a detector unit containing diaphragms and associated contacts set to actuate at a predetermined pressure. The system is sealed except for calibrated vents that compensate for normal changes in temperature. (SIG-IDS)
Portable Fire Extinguisher. {10-2018}	A portable device, carried or on wheels and operated by hand, containing an extinguishing agent that can be expelled under pressure for the purpose of suppressing or extinguishing fire.
Portable Monitor (Cannon). {11-2016}	A device that delivers a foam monitor stream and is mounted on a movable support or wheels so it can be transported to the fire scene.
Portable System. {11-2016}	Foam-producing equipment, materials, hose, and so forth that are transported by hand.
Positive Alarm Sequence. {72-2016}	An automatic sequence that results in an alarm signal, even when manually delayed for investigation, unless the system is reset. (SIG-PRO)
Positive Displacement Pump. {20-2016}	A pump that is characterized by a method of producing flow by capturing a specific volume of fluid per pump revolution and reducing the fluid void by a mechanical means to displace the pumping fluid.
Power Supply. {72-2016}	A source of electrical operating power, including the circuits and terminations connecting it to the dependent system components. (SIG-FUN)
Power-Operated Fire Doors. {80-2016}	Doors that normally are opened and closed electrically, pneumatically, or hydraulically.
Preaction Sprinkler System. {25-2017}	A sprinkler system employing automatic sprinklers that are attached to a piping system that contains air that might or might not be under pressure, with a supplemental detection system installed in the same areas as the sprinklers. [13, 2016]
Pre-Alarm Condition. {72-2016}	An abnormal condition that poses a potential threat to life, property, or mission, and time is available for investigation. (SIG-FUN)
Pre-Alarm Signal. {72-2016}	A signal that results from the detection of a pre-alarm condition. (SIG-FUN)
Pre-Engineered System. {12-2015}	A system that has predetermined flow rates, nozzle placement, and quantities of carbon dioxide and that incorporates specific nozzles and methods of application that can differ from those detailed elsewhere in this standard and those that are listed by a testing laboratory.
Pre-Engineered System. {2001-2015}	A system having predetermined flow rates, nozzle pressures, and quantities of agent. These systems have the specific pipe size, maximum and minimum pipe lengths, flexible hose specifications, number of fittings, and number and types of nozzles prescribed by a testing laboratory. The hazards protected by these systems are specifically limited as to type and size by a testing laboratory based upon actual fire tests. Limitations on hazards that can be protected by these systems are contained in the manufacturer's installation manual, which is referenced as part of the listing.
Pre-Engineered Systems. {17-2017}	Those systems having predetermined flow rates, nozzle pressures, and quantities of extinguishing agent and having specific pipe size, maximum and minimum pipe lengths, flexible-hose specifications, number of fittings, and number and types of nozzles.
Pre-Engineered Systems. {17A-2013}	Those systems having predetermined flow rates, nozzle pressures, and quantities of extinguishing agent and having specific pipe size, maximum and minimum pipe lengths, flexible hose specifications, number of fittings, and number and types of nozzles.

Premixed Antifreeze Solution. {25-2017}	A mixture of an antifreeze material with water that is prepared and factory mixed by the manufacturer with a quality control procedure in place that ensures that the antifreeze solution remains homogeneous and that the concentration is as specified. [13, 2016]
Preplanned Impairment. {25-2017}	A condition where a waterbased fire protection system or a portion thereof is out of service due to work planned in advance, such as revisions to the water supply or sprinkler system piping.
Preprimed System. {16-2015}	A wet pipe system containing foam solution.
Pressure Control Valve. {20-2016}	A pilot-operated pressure-reducing valve designed for the purpose of reducing the downstream water pressure to a specific value under both flowing (residual) and nonflowing (static) conditions. [14, 2013]
Pressure Control Valve. {25-2017}	A pilot-operated pressurereducing valve designed for the purpose of reducing the downstream water pressure to a specific value under both flowing (residual) and nonflowing (static) conditions. [14, 2016]
Pressure Foam Maker (High Back Pressure or Forcing Type). {11-2016}	A foam maker utilizing the Venturi principle for aspirating air into a stream of foam solution forms foam under pressure.
Pressure Maintenance (Jockey or Make-Up) Pump. {20-2016}	A pump designed to maintain the pressure on the fire protection system(s) between preset limits when the system is not flowing water.
Pressure Proportioning Tank. {11-2016}	A foam concentrate tank with no bladder that uses waterflow through an orifice to displace a foam concentrate,having a specific gravity of at least 1.15, in the tank with water to add foam concentrate through an orifice into a water line at a specified rate.
Pressure Relief Valve. {25-2017}	A device that allows the diversion of liquid to limit excess pressure in a system. [20, 2016]
Pressure Vacuum Vent. {25-2017}	A venting device mounted on atmospheric foam concentrate storage vessels to allow for concentrate expansion and contraction and for tank breathing during concentrate discharge or filling.
Pressure-Reducing Valve. {20-2016}	A valve designed for the purpose of reducing the downstream water pressure under both flowing (residual) and nonflowing (static) conditions. [14, 2013]
Pressure-Reducing Valve. {25-2017}	A valve designed for the purpose of reducing the downstream water pressure under both flowing (residual) and nonflowing (static) conditions. [14, 2016]
Pressure-Regulating Device. {25-2017}	A device designed for the purpose of reducing, regulating, controlling, or restricting water pressure. [14, 2016]
Pressure-Restricting Device. {25-2017}	A valve or device designed for the purpose of reducing the downstream water pressure under flowing (residual) conditions only. [14, 2016]
Pressurized Stairwells. {92-2015}	A type of containment smoke control system in which stair shafts are mechanically pressurized, with respect to the fire area, with outdoor air to keep smoke from contaminating them during a fire incident.
Primary Battery (Dry Cell). {72-2016}	A nonrechargeable battery requiring periodic replacement. (SIG-FUN)
Private Fire Service Main. {25-2017}	Private fire service main, as used in this standard, is that pipe and its appurtenances on private property that is between a source of water and the base of the system riser for water-based fire protection systems; between a source of water and inlets to foam-making systems; between a source of water and the base elbow of private hydrants or monitor nozzles; and used as fire pump suction and discharge piping, beginning at the inlet side of the check valve on a gravity or pressure tank. [24, 2016]
Projected Beam–Type Detector. {72-2016}	A type of photoelectric light obscuration smoke detector wherein the beam spans the protected area. (SIG-IDS)
Proportioning. {16-2015}	The continuous introduction of foam concentrate at the recommended ratio into the water stream to form foam solution. [11, 2010]
Proprietary Supervising Station Alarm System. {72-2016}	An installation of an alarm system that serves contiguous and noncontiguous properties, under one ownership, from a proprietary supervising station located at the protected premises, or at one of multiple noncontiguous protected premises, at which trained, competent personnel are in constant attendance. This includes the protected premises fire alarm system(s); proprietary supervising station; power supplies; signal-initiating devices; initiating device circuits; signal notification appliances; equipment for the automatic, permanent visual recording of signals; and equipment for initiating the operation of emergency building control services. (SIG-SSS)
Proprietary Supervising Station Service. {72-2016}	The use of a system or a group of systems including the protected premises fire alarm system(s) in which the operations of circuits and devices are signaled to, recorded in, and supervised from a supervising station under the same ownership as the protected premises that has competent and experienced operators who, upon receipt of a signal, take such action as required by this Code. Related activities at the protected premises, such as equipment installation, inspection, testing, maintenance, and runner service, are the responsibility of the owner. Proprietary supervising station service is controlled and operated by the entity whose properties are the protected premises. (SIG-SSS)

Proprietary Supervising Station. {72-2016}	A supervising station under the same ownership as the protected premises fire alarm system(s) that it supervises (monitors) and to which alarm, supervisory, or trouble signals are received and where personnel are in attendance at all times to supervise operation and investigate signals. (SIG-SSS)
Protected Premises (Local) Control Unit. {72-2016}	A fire alarm control unit that serves the protected premises or a portion of the protected premises. (SIG-PRO)
Protected Premises (Local) Fire Alarm System. {72-2016}	A fire alarm system located at the protected premises. (SIG-PRO)
Protein Foam Concentrate. {16-2015}	Concentrate consisting primarily of products from a protein hydrolysate, plus stabilizing additives and inhibitors to protect against freezing, to prevent corrosion of equipment and containers, to resist bacterial decomposition, to control viscosity, and to otherwise ensure readiness for use under emergency conditions. [11, 2010]
Public Address System. {72-2016}	An electronic amplification system with a mixer, amplifier, and loudspeakers, used to reinforce a given sound and distributing the “sound” to the general public around a building. (SIG-ECS)
Public Emergency Alarm Reporting System. {72-2016}	A system of alarm-initiating devices, transmitting and receiving equipment, and communication infrastructure (other than a public telephone network) used to communicate with the communications center to provide any combination of manual or auxiliary alarm service. (SIG-PRS)
Pump Proportioner (Around-the-Pump Proportioner). {11-2016}	A system that uses a venturi eductor installed in a bypass line between the discharge and suction side of a water pump and suitable variable or fixed orifices to induct foam concentrate from a tank or container into the pump suction line.
Qualified Person. {110-2016}	One who has skills and knowledge related to the operation, maintenance, repair, and testing of the EPSS equipment and installations and has received safety training to recognize and avoid the hazards involved.
Qualified Person. {80-2016}	A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with the subject matter, the work, or the project.
Qualified. {25-2017}	A competent and capable person who has met the requirements and training for a given field acceptable to the AHJ. [96, 2014]
Qualified. {72-2016}	A competent and capable person or company that has met the requirements and training for a given field acceptable to the authority having jurisdiction. (SIG-TMS)
Quarterly Frequency. {25-2017}	Occurring four times per year with a minimum of 2 months and a maximum of 4 months.
Quick-Response (QR) Sprinkler. {25-2017}	A type of spray sprinkler that has a thermal element with an RTI of 50 (meter-seconds)1/2 or less and is listed as a quick-response sprinkler for its intended use. [13, 2016]
Quick-Response Early Suppression (QRES) Sprinkler. {25-2017}	A type of quick-response sprinkler that has a thermal element with an RTI of 50 (meter-seconds)1/2 or less and is listed for its capability to provide fire suppression of specific fire hazards. [13, 2016]
Quick-Response Extended Coverage Sprinkler. {25-2017}	A type of quick-response sprinkler that has a thermal element with an RTI of 50 (meter-seconds)1/2 or less and complies with the extended protection areas defined in Chapter 8 of NFPA 13. [13, 2016]
Radiant Energy–Sensing Fire Detector. {72-2016}	A device that detects radiant energy, such as ultraviolet, visible, or infrared, that is emitted as a product of combustion reaction and obeys the laws of optics. (SIG-IDS)
Radio Alarm Repeater Station Receiver (RARSR). {72-2016}	A system component that receives radio signals and resides at a repeater station that is located at a remote receiving location. (SIG-SSS)
Radio Alarm Supervising Station Receiver (RASSR). {72-2016}	A system component that receives data and annunciates that data at the supervising station. (SIG-SSS)
Radio Alarm System (RAS). {72-2016}	A system in which signals are transmitted from a radio alarm transmitter (RAT) located at a protected premises through a radio channel to two or more radio alarm repeater station receivers (RARSR) and that are annunciated by a radio alarm supervising station receiver (RASSR) located at the supervising station. (SIG-SSS)
Radio Alarm Transmitter (RAT). {72-2016}	A system component at the protected premises to which initiating devices or groups of devices are connected that transmits signals indicating a status change of the initiating devices. (SIG-SSS)
Radio Channel. {72-2016}	A band of frequencies of a width sufficient to allow its use for radio communications. (SIG-SSS)
Rate Compensation Detector. {72-2016}	A device that responds when the temperature of the air surrounding the device reaches a predetermined level, regardless of the rate-of-temperature rise. (SIG-IDS)
Rate. {16-2015}	The total flow of solution per unit of time, which is expressed in gpm (L/min) in this standard.
Rated Flow. {20-2016}	The capacity of the pump at rated speed and rated pressure as marked on the manufacturer's nameplate.
Rated Speed. {20-2016}	The speed for which the fire pump is listed and that appears on the fire pump nameplate.
Rate-of-Rise Detector. {72-2016}	A device that responds when the temperature rises at a rate exceeding a predetermined value. (SIG-IDS)

Rebuild. {25-2017}	To restore working condition by replacement or repair of worn or damaged parts.
Recessed Sprinkler. {25-2017}	A sprinkler in which all or part of the body, other than the shank thread, is mounted within a recessed housing. [13, 2016]
Recharge. {17-2017}	The replacement of the extinguishing agent and expellant gas. [17A, 2017]
Rechargeable (Refillable) Fire Extinguisher. {10-2018}	A fire extinguisher capable of undergoing complete maintenance, including internal inspection of the pressure vessel, replacement of all substandard parts and seals, and hydrostatic testing.
Recharging. {10-2018}	The replacement of the extinguishing agent (also includes the expellant for certain types of fire extinguishers).
Reduced-Pressure Principle Backflow Prevention Assembly (RPBA). {25-2017}	Two independently acting check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves, along with two resilient-seated shutoff valves, all as an assembly, and equipped with properly located test cocks.
Releasing Fire Alarm System. {72-2016}	A protected premises fire alarm system that is part of a fire suppression system and/or that provides control inputs to a fire suppression system related to the fire suppression system's sequence of operations and outputs for other signaling and notification. (SIG-PRO)
Releasing Service Fire Alarm Control Unit. {72-2016}	A protected premises fire alarm control unit specifically listed for releasing service that is part of a fire suppression system and which provides control outputs to release a fire suppression agent based on either automatic or manual input. (SIG-PRO)
Relief Valve. {20-2016}	A device that allows the diversion of liquid to limit excess pressure in a system.
Remote Supervising Station Alarm System. {72-2016}	A protected premises fire alarm system (exclusive of any connected to a public emergency reporting system) in which alarm, supervisory, or trouble signals are transmitted automatically to, recorded in, and supervised from a remote supervising station that has competent and experienced servers and operators who, upon receipt of a signal, take such action as required by this Code. (SIG-SSS)
Remote Supervising Station Service. {72-2016}	The use of a system including the protected premises fire alarm system(s) in which the operations of circuits and devices are signaled to, recorded in, and supervised from a supervising station that has competent and experienced operators who, upon receipt of a signal, take such action as required by this Code. Related activities at the protected premises, such as equipment installation, inspection, testing, and maintenance, are the responsibility of the owner. (SIG-SSS)
Remote Supervising Station. {72-2016}	A supervising station to which alarm, supervisory, or trouble signals or any combination of those signals emanating from protected premises fire alarm systems are received and where personnel are in attendance at all times to respond. (SIG-SSS)
Remove. {25-2017}	To physically take away or eliminate.
Repair. {25-2017}	Restore to sound working condition or to fix damage.
Repeater Station. {72-2016}	The location of the equipment needed to relay signals between supervising stations, subsidiary stations, and protected premises. (SIG-SSS)
Replace. {25-2017}	To remove a component and install a new or equivalent component.
Residual Hydrant. {13-2016}	The hydrant that is used for measuring static and residual pressures during a flow test. [24, 2013]
Residual Pressure. {13-2016}	The pressure that exists in the distribution system, measured at the residual hydrant at the time the flow readings are taken at the flow hydrants. [24, 2013]
Restorable Initiating Device. {72-2016}	A device in which the sensing element is not ordinarily destroyed in the process of operation, whose restoration can be manual or automatic. (SIG-IDS)
Restoration Signal. {72-2016}	A signal that results from the return to normal condition of an initiating device, system element, or system. (SIG-FUN)
Retaining Angle. {80-2016}	The metal angle used to retain the fire damper in the opening.
Retrofit Operator. {80-2016}	A device labeled as a "retrofit rolling steel fire door operator" intended to replace operator and governor systems (including automatic-closing devices) used on existing listed rolling steel fire doors.
Risers. {13-2016}	The vertical supply pipes in a sprinkler system.
Risk Analysis. {72-2016}	A process to characterize the likelihood, vulnerability, and magnitude of incidents associated with natural, technological, and manmade disasters and other emergencies that address scenarios of concern, their probability, and their potential consequences. (SIG-ECS)
Rolling Steel Fire Door. {80-2016}	A fire door assembly consisting of a curtain, a bottom bar, a barrel, brackets, guides, a hood, and an automatic-releasing device.
Rotary Lobe Pump. {20-2016}	A positive displacement pump characterized by the use of a rotor lobe to carry fluid between the lobe void and the pump casing from the inlet to the outlet.

Rotary Vane Pump. {20-2016}	A positive displacement pump characterized by the use of a single rotor with vanes that move with pump rotation to create a void and displace liquid.
Runner Service. {72-2016}	The service provided by a runner at the protected premises, including restoration, resetting, and silencing of all equipment transmitting fire alarm or supervisory or trouble signals to an off-premises location. (SIG-SSS)
Runner. {72-2016}	A person other than the required number of operators on duty at central, supervising, or runner stations (or otherwise in contact with these stations) available for prompt dispatching, when necessary, to the protected premises. (SIG-SSS)
Sectional Drain. {25-2017}	A drain located beyond a sectional control valve that drains only a portion of the system.
Selector Valve. {17-2017}	A device used to direct dry chemical to the hazard being protected.
Self-Closing Doors. {80-2016}	Doors that, when opened and released, return to the closed position.
Self-Educting Nozzle. {11-2016}	A device that incorporates a venturi to draw foam concentrate through a short length of pipe and/or flexible tubing connected to the foam supply.
Self-Expelling Fire Extinguisher. {10-2018}	A fire extinguisher in which the agent has sufficient vapor pressure at normal operating temperatures to expel itself.
Semiannual Frequency. {25-2017}	Occurring twice per year with a minimum of 4 months and a maximum of 8 months.
Semiautomatic Dry Standpipe System. {25-2017}	A standpipe system permanently attached to a water supply that is capable of supplying the system demand at all times arranged through the use of a device such as a deluge valve and that requires activation of a remote control device to provide water at hose connections. [14, 2016]
Semiautomatic Hose Rack Assembly. {25-2017}	The same as a “conventional” pin rack or hose reel except that, after the valve is opened, a retaining device holds the hose and water until the last few feet are removed.
Semifixed System. {11-2016}	A system in which the hazard is equipped with fixed discharge outlets connected to piping that terminates at a safe distance.
Semisubsurface Foam Injection. {11-2016}	Discharge of foam at the liquid surface within a storage tank from a floating hose that rises from a piped container near the tank bottom.
Sensing Edge (Rolling Steel Fire Door). {80-2016}	A device added to the underside of the bottom bar of a power-operated rolling steel fire door or fire shutter that stops or reverses the door curtain upon contact with an obstruction when closing under power.
Series Fire Pump Unit. {20-2016}	All fire pump units located within the same building that operate in a series arrangement where the first fire pump takes suction directly from a water supply and each sequential pump takes suction under pump pressure from the preceding pump. Two pumps that operate in series through a tank(s) or break tank(s) are not considered part of a series fire pump unit.
Service Equipment. {20-2016}	The necessary equipment, usually consisting of a circuit breaker(s) or switch(es) and fuse(s) and their accessories, connected to the load end of service conductors to a building or other structure, or an otherwise designated area, and intended to constitute the main control and cutoff of the supply. [70: Art. 100]
Service. {20-2016}	The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served. [70: Art. 100]
Servicing. {10-2018}	Performing maintenance, recharging, or hydrostatic testing on a fire extinguisher.
Set Pressure. {20-2016}	As applied to variable speed pressure limiting control systems, the pressure that the variable speed pressure limiting control system is set to maintain.
Shall. {25-2017}	Indicates a mandatory requirement.
Should. {25-2017}	Indicates a recommendation or that which is advised but not required.
Shutoff Devices. {17A-2013}	Devices that operate simultaneously with the extinguishing system to shut off fuel and power to appliances protected by the system and other appliances required to be shut off upon operation of the system.
Shutter. {80-2016}	A labeled door assembly that is used for the protection of a window opening in an exterior wall. (See also 3.3.64, Fire Shutter.)
Side Light Frame. {80-2016}	A fire door frame prepared for the application of a glazing material alongside the door opening.
Side Light. {80-2016}	An opening in a fire door frame alongside the fire door opening that is filled with glazing material.
Sidewall Sprinkler. {25-2017}	A sprinkler having special deflectors that are designed to discharge most of the water away from the nearby wall in a pattern resembling one-quarter of a sphere, with a small portion of the discharge directed at the wall behind the sprinkler. [13, 2016]

Signal Transmission Sequence. {72-2016}	A DACT that obtains dial tone, dials the number(s) of the DACR, obtains verification that the DACR is ready to receive signals, transmits the signals, and receives acknowledgment that the DACR has accepted that signal before disconnecting (going on-hook). (SIG-SSS)
Signal. {72-2016}	An indication of a condition communicated by electrical, visible, audible, wireless, or other means. (SIG-FUN)
Signaling Line Circuit Interface. {72-2016}	A system component that connects a signaling line circuit to any combination of initiating devices, initiating device circuits, notification appliances, notification appliance circuits, system control outputs, and other signaling line circuits. (SIG-PRO)
Signaling Line Circuit. {72-2016}	A circuit path between any combination of addressable appliances or devices, circuit interfaces, control units, or transmitters over which multiple system input signals or output signals or both are carried. (SIG-PRO)
Site-Specific Software. {72-2016}	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)
Smoke Barrier. {92-2015}	For the purposes of this standard, a continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly, that is designed and constructed to restrict the movement of smoke in conjunction with a smoke control system.
Smoke Containment. {92-2015}	A smoke control method that uses mechanical equipment to produce pressure differences across smoke barriers.
Smoke Control System. {92-2015}	An engineered system that includes all methods that can be used singly or in combination to modify smoke movement.
Smoke Damper. {80-2016}	A device within an air distribution system to control the movement of smoke.
Smoke Detector. {72-2016}	A device that detects visible or invisible particles of combustion. (SIG-IDS)
Smoke Exhaust System. {92-2015}	A mechanical or gravity system intended to move smoke from the smoke zone to the exterior of the building, including smoke removal, purging, and venting systems, as well as the function of exhaust fans utilized to reduce the pressure in a smoke zone.
Smoke Management. {92-2015}	A smoke control method that utilizes natural or mechanical systems to maintain a tenable environment in the means of egress from a large-volume space or to control and reduce the migration of smoke between the fire area and communicating spaces.
Smoke. {92-2015}	The airborne solid and liquid particulates and gases evolved when a material undergoes pyrolysis or combustion, together with the quantity of air that is entrained or otherwise mixed into the mass. [556, 2011]
Software. {72-2016}	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 types: executive software and site-specific software. (SIG-TMS)
Spark/Ember Detector. {72-2016}	A radiant energy–sensing fire detector that is designed to detect sparks or embers, or both. These devices are normally intended to operate in dark environments and in the infrared part of the spectrum. (SIG-IDS)
Special Sprinkler. {25-2017}	A sprinkler that has been tested and listed as prescribed in 8.4.8 of NFPA 13. [13, 2016]
Spot-Type Detector. {72-2016}	A device in which the detecting element is concentrated at a particular location. Typical examples are bimetallic detectors, fusible alloy detectors, certain pneumatic rate-of-rise detectors, certain smoke detectors, and thermoelectric detectors. (SIG-IDS)
Spray Sprinkler. {25-2017}	A type of sprinkler listed for its capability to provide fire control for a wide range of fire hazards. [13, 2016]
Sprinkler System. {25-2017}	A system that consists of an integrated network of piping designed in accordance with fire protection engineering standards that includes a water supply source, a water control valve, a waterflow alarm, and a drain. The portion of the sprinkler system above ground is a network of specifically sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern. The system is commonly activated by heat from a fire and discharges water over the fire area. [13, 2016]
Standard Balanced Pressure Proportioner. {25-2017}	A system that utilizes a foam concentrate pump where foam concentrate is drawn from an atmospheric storage tank, is pressurized by the pump, and passes back through a diaphragm balancing valve to the storage tank.
Standard Pressure Proportioner. {25-2017}	A system that uses a pressure vessel containing foam concentrate where water is supplied to the proportioner, which directs an amount of the supply downward onto the contained concentrate, thereby pressurizing the tank.
Standard Spray Sprinkler. {25-2017}	A spray sprinkler with maximum coverage areas as specified in Sections 8.6 and 8.7 of NFPA 13. [13, 2016]
Standpipe Class I System. {25-2017}	A system that provides 2 1⁄2 in. (65 mm) hose connections to supply water for use by fire departments. [14, 2016]
Standpipe Class II System. {25-2017}	A system that provides 1 1⁄2 in. (40 mm) hose stations to supply water for use primarily by trained personnel or by the fire department during initial response. [14, 2016]

Standpipe Class III System. {25-2017}	A system that provides 1 1⁄2 in. (40 mm) hose stations to supply water for use by trained personnel and 2 1⁄2 in. (65 mm) hose connections to supply a larger volume of water for use by fire departments. [14, 2016]
Standpipe System and Mobile Supply. {12-2015}	A system consisting of a mobile supply of carbon dioxide, designed to be quickly moved into position and connected to a system of fixed piping, supplying fixed nozzles or hose lines or both that are designed for either total flooding or local application.
Standpipe System. {25-2017}	An arrangement of piping, valves, hose connections, and associated equipment installed in a building or structure, with the hose connections located in such a manner that water can be discharged in streams or spray patterns through attached hose and nozzles, for the purpose of extinguishing a fire, thereby protecting a building or structure and its contents in addition to protecting the occupants. [14, 2016]
Standpipe. {14-2016}	The system piping that delivers the water supply for hose connections, and for sprinklers on combined systems, vertically from floor to floor.
Static Pressure. {13-2016}	The pressure that exists at a given point under normal distribution system conditions measured at the residual hydrant with no hydrants flowing. [24, 2013]
Static System. {80-2016}	An HVAC system designed to stop the movement of air within the system at the indication of a fire.
Stored Emergency Power Supply System (SEPSS). {111-2013}	A system consisting of a UPS, a rectifier plant, or a motor generator powered by a stored electrical energy source; a transfer switch designed to monitor preferred and alternate load power source and provide desired switching of the load; and all necessary control equipment to make the system functional.
Stored-Pressure Fire Extinguisher. {10-2018}	A fire extinguisher in which both the extinguishing agent and expellant gas are kept in a single container, and that includes a pressure indicator or gauge.
Straight-Lift Fire Safety Curtain. {80-2016}	A fire safety curtain consisting of one or more flat panel(s) that lifts up and stores above the proscenium opening.
Strainer. {25-2017}	A device capable of removing from the water all solids of sufficient size that are obstructing water spray nozzles.
Subsurface Foam Injection. {11-2016}	Discharge of foam into a storage tank from an outlet near the tank bottom.
Suction Pressure Regulating Valve. {20-2016}	A pilot-operated valve installed in discharge piping that maintains positive pressure in the suction piping, while monitoring pressure in the suction piping through a sensing line.
Superpressurization. {2001-2015}	The addition of gas to a fire extinguishing agent container to achieve a specified pressure therein.
Supervising Station. {72-2016}	A facility that receives signals from protected premises fire alarm systems and at which personnel are in attendance at all times to respond to these signals. (SIG-SSS)
Supervision. {13-2016}	A visual and audible alarm signal given at the central safety station to indicate when the system is in operation or when a condition that would impair the satisfactory operation of the system exists. Supervisory alarms must give a distinct indication for each individual system component that is monitored.
Supervision. {25-2017}	In water-based fire protection systems, a means of monitoring system status and indicating abnormal conditions.
Supervisory Condition. {72-2016}	An abnormal condition in connection with the supervision of other systems, processes, or equipment. (SIG-FUN)
Supervisory Device. {13-2016}	A device arranged to supervise the operative condition of automatic sprinkler systems.
Supervisory Service. {72-2016}	The service required to monitor performance of guard tours and the operative condition of fixed suppression systems or other systems for the protection of life and property. (SIG-PRO)
Supervisory Signal Initiating Device. {72-2016}	An initiating device such as a valve supervisory switch, water level indicator, or low air pressure switch on a dry pipe sprinkler system in which the change of state signals an off-normal condition and its restoration to normal of a fire protection or life safety system; or a need for action in connection with guard tours, fire suppression systems or equipment, or maintenance features of related systems. (SIG-IDS)
Supervisory Signal. {72-2016}	A signal that results from the detection of a supervisory condition. (SIG-FUN)
Synthetic Foam Concentrate. {16-2015}	Concentrate based on foaming agents other than hydrolyzed proteins and including aqueous film-forming foam (AFFF) concentrates, medium- and high-expansion foam concentrates, and other synthetic foam concentrates. [11, 2010]
System Riser. {13-2016}	The aboveground horizontal or vertical pipe between the water supply and the mains (cross or feed) that contains a control valve (either directly or within its supply pipe), a pressure gauge, a main drain, and a waterflow alarm device.
System Working Pressure. {13-2016}	The maximum anticipated static (nonflowing) or flowing pressure applied to sprinkler system components exclusive of surge pressures and exclusive of pressure from the fire department connection.
Tactile Notification Appliance. {72-2016}	A notification appliance that alerts by the sense of touch or vibration. (SIG-NAS)
Tenable Environment. {92-2015}	An environment in which smoke and heat are limited or otherwise restricted to maintain the impact on occupants to a level that is not life threatening.

Test. {25-2017}	The operation of a device to verify that it is functioning correctly, or the measurement of a system characteristic to determine if it meets requirements.
Testing. {25-2017}	A procedure used to determine the operational status of a component or system by conducting periodic physical checks, such as waterflow tests, fire pump tests, alarm tests, and trip tests of dry pipe, deluge, or preaction valves.
Textual Audible Notification Appliance. {72-2016}	A notification appliance that conveys a stream of audible information. (SIG-NAS)
Textual Visible Notification Appliance. {72-2016}	A notification appliance that conveys a stream of visible information that displays an alphanumeric or pictorial message. (SIG-NAS)
Three Years Frequency. {25-2017}	Occurring once every 36 months with a minimum of 30 months and a maximum of 40 months.
Total Flooding System. {12-2015}	A system consisting of a supply of carbon dioxide arranged to discharge into, and fill to the proper concentration, an enclosed space or enclosure around the hazard.
Total Flooding System. {17-2017}	A supply of dry chemical permanently connected to fixed piping and nozzles that are arranged to discharge dry chemical into an enclosure surrounding the hazard.
Total Flooding System. {2001-2015}	A system consisting of an agent supply and distribution network designed to achieve a total flooding condition in a hazard volume.
Total Flooding. {2001-2015}	The act and manner of discharging an agent for the purpose of achieving a specified minimum agent concentration throughout a hazard volume.
Trained. {17-2017}	A person who has undergone the instructions necessary to safely design, install, and reliably perform the maintenance and recharge service in accordance with the manufacturer's design, installation, and maintenance manual.
Transmission Channel. {72-2016}	A circuit or path connecting transmitters to supervising stations or subsidiary stations on which signals are carried. (SIG-SSS)
Transmitter. {72-2016}	A system component that provides an interface between signaling line circuits, initiating device circuits, or control units and the transmission channel. (SIG-SSS)
Transom and Side Light Frame. {80-2016}	A fire door frame prepared for the application of a glazing material above and alongside the door opening.
Transom and Side Panel Frame. {80-2016}	A fire door frame prepared for the application of solid metal or wood panels above and alongside the door opening.
Transom Light Frame. {80-2016}	A fire door frame prepared for the application of a glazing material above the door opening that has a horizontal member such as a transom bar provided to separate the glazed opening from the door opening.
Transom Panel Frame. {80-2016}	A fire door frame prepared for the application of a transom panel above the door opening that has a horizontal member such as a transom bar provided to separate the transom opening from the door opening unless the transom panel or the bottom of the panel and the top of the door are rabbeted.
Transom Panel. {80-2016}	A panel, fixed or removable, installed in a frame above the door.
Transom. {80-2016}	An opening in a fire door frame above the door opening that is filled by a solid panel or with glazing material.
Travel Distance. {10-2018}	The actual walking distance from a point to the nearest fire extinguisher fulfilling hazard requirements.
Trouble Condition. {72-2016}	An abnormal condition in a system due to a fault. (SIG-FUN)
Trouble Signal. {72-2016}	A signal that results from the detection of a trouble condition. (SIG-FUN)
Two-Way Emergency Communications System. {72-2016}	Two way emergency communications systems are divided into two categories, those systems that are anticipated to be used by building occupants and those systems that are to be used by fire fighters, police, and other emergency services personnel. Two-way emergency communications systems are used to both exchange information and to communicate information such as, but not limited to, instructions, acknowledgement of receipt of messages, condition of local environment, and condition of persons, and to give assurance that help is on the way. (SIG-ECS)
Type I Discharge Outlet. {11-2016}	An approved discharge outlet that conducts and delivers foam gently onto the liquid surface without submergence of the foam or agitation of the surface.
Type II Discharge Outlet. {11-2016}	An approved discharge outlet that does not deliver foam gently onto the liquid surface but is designed to lessen submergence of the foam and agitation of the surface.
Ultra High-Speed Water Spray System. {25-2017}	A type of automatic water spray system where water spray is rapidly applied to protect specific hazards where deflagrations are anticipated. [15, 2017]
Unframed Fire Safety Curtain. {80-2016}	A straight lift fire safety curtain containing no internal vertical framing members.
Unintentional Alarm. {72-2016}	An unwanted activation of an alarm initiating device caused by a person acting without malice. (SIG-FUN)

Uninterruptible Power Supply (UPS). {111-2013}	A system consisting of a stored energy source, designed to continuously provide a clean, conditioned sinusoidal wave of power under normal conditions and for a finite period of time upon loss of the primary power source.
Unknown Alarm. {72-2016}	An unwanted activation of an alarm initiating device or system output function where the cause has not been identified. (SIG-FUN)
Unloader Valve. {20-2016}	A valve that is designed to relieve excess flow below pump capacity at set pump pressure.
Unoccupiable Enclosure or Space. {12-2015}	An enclosure or space that has dimensions and physical characteristics such that it could not be entered by a person.
Unwanted Alarm. {72-2016}	Any alarm that occurs that is not the result of a potentially hazardous condition. (SIG-FUN)
Upright Sprinkler. {25-2017}	A sprinkler designed to be installed in such a way that the water spray is directed upwards against the deflector. [13, 2016]
Valve Status Test Connection. {25-2017}	A point in the system where water is discharged for purposes of performing a valve status test.
Valve Status Test. {25-2017}	Flowing water to verify that valves for a portion of the system are not closed.
Variable Speed Pressure Limiting Control. {20-2016}	A speed control system used to limit the total discharge pressure by reducing the pump driver speed from rated speed.
Variable Speed Suction Limiting Control. {20-2016}	A speed control system used to maintain a minimum positive suction pressure at the pump inlet by reducing the pump driver speed while monitoring pressure in the suction piping through a sensing line.
Vertical Access Door. {80-2016}	An access door installed in the vertical plane used to protect openings in fire-rated walls.
Vertical Lineshaft Turbine Pump. {20-2016}	A vertical shaft centrifugal pump with rotating impeller or impellers and with discharge from the pumping element coaxial with the shaft. The pumping element is suspended by the conductor system, which encloses a system of vertical shafting used to transmit power to the impellers, the prime mover being external to the flow stream.
Vertically Sliding Door. {80-2016}	Labeled single-piece doors and sectional doors operating in a vertical direction.
Video Image Flame Detection (VIFD). {72-2016}	The principle of using automatic analysis of real-time video images to detect the presence of flame. (SIG-IDS)
Video Image Smoke Detection (VISD). {72-2016}	The principle of using automatic analysis of real-time video images to detect the presence of smoke. (SIG-IDS)
Visible Notification Appliance. {72-2016}	A notification appliance that alerts by the sense of sight. (SIG-NAS)
Volume Control Damper. {80-2016}	A fire damper, smoke damper, or combination fire/smoke damper that is also used to control the volume of air in an HVAC system.
Wall Hydrant. {25-2017}	A hydrant mounted on the outside of a wall of a building, fed from interior piping, and equipped with control valves located inside the building that normally are key-operated from the building's exterior.
Water Mist Fire Extinguisher. {10-2018}	A fire extinguisher containing distilled or de-ionized water and employing a nozzle that discharges the agent in a fine spray.
Water Mist Positive Displacement Pumping Unit. {20-2016}	Multiple positive displacement pumps designed to operate in parallel that discharges into a single common water mist distribution system.
Water Mist System. {25-2017}	A distribution system connected to a water supply or water and atomizing media supplies that is equipped with one or more nozzles capable of delivering water mist intended to control, suppress, or extinguish fires and that has been demonstrated to meet the performance requirements of its listing and [the applicable] standard. [750, 2015]
Water Spray Nozzle. {25-2017}	An open or automatic water discharge device that, when discharging water under pressure, will distribute the water in a specific, directional pattern.
Water Spray System. {25-2017}	An automatic or manually actuated fixed pipe system connected to a water supply and equipped with water spray nozzles designed to provide a specific water discharge and distribution over the protected surfaces or area. [15, 2017]
Water Spray. {25-2017}	Water in a form having a predetermined pattern, particle size, velocity, and density discharge from specially designed nozzles or devices. [15, 2017]
Water Supply. {25-2017}	A source of water that provides the flows [gal/min (L/min)] and pressures [psi (bar)] required by the water-based fire protection system.
Water Tank. {25-2017}	A tank supplying water for water-based fire protection systems.
Waterflow Alarm Device. {25-2017}	An attachment to a waterbased fire protection system that detects and signals a predetermined waterflow.
Water-Type Fire Extinguisher. {10-2018}	A fire extinguisher containing water-based agents, such as water, film-forming foam agents (AFFF, FFFP), antifreeze, loaded stream, and wet chemical.

Weekly Frequency. {25-2017}	Occurring once per calendar week.
Wet Chemical. {10-2018}	Normally an aqueous solution of organic or inorganic salts or a combination thereof that forms an extinguishing agent. [17A, 2017]
Wet Pipe Sprinkler System. {25-2017}	A sprinkler system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by heat from a fire. [13, 2016]
Wet Standpipe System. {25-2017}	A standpipe system having piping containing water at all times. [14, 2016]
Wetting Agent. {10-2018}	A concentrate that, when added to water, reduces the surface tension and increases its ability to penetrate and spread. [18, 2017]
Wheeled Fire Extinguisher. {10-2018}	A portable fire extinguisher equipped with a carriage and wheels intended to be transported to the fire by one person. (See A.5.3.2.7.)
Window Frame. {80-2016}	The perimeter of a window.
Window Mullion. {80-2016}	The separate horizontal or vertical member or members used to join windows in a multiple window opening.
Window. {80-2016}	Integral fabricated units, placed in an opening in a wall, primarily intended for the admission of light, or light and air, and not intended primarily for human entrance or exit.
Wireless Protection System. {80-2016}	A system or a part of a system that can transmit and receive signals without the aid of interconnection wiring. It can consist of either a wireless control unit or a wireless repeater. (SIG-PRO)
Wireless Repeater. {80-2016}	A component used to relay signals among wireless devices, appliances, and control units. (SIG-PRO)
Zoned Smoke Control System. {92-2015}	A smoke control system that includes a combination of smoke containment and smoke management methods for smoke exhaust for the smoke zone and pressurization for all contiguous smoke control zones.

APPENDIX B – INDEX OF FORMS

Chapter 1 SPRINKLER SYSTEMS

PA 4000	SPRINKLER SYSTEMS GENERAL INFORMATION
PA 4001	SPRINKLER SYSTEMS GAUGES – INSPECTION / TESTING
PA 4002	SPRINKLER SYSTEMS CONTROL VALVES – INSPECTION / TESTING / MAINTENANCE
PA 4003	SPRINKLER SYSTEMS VALVES – EXTERIOR INSPECTIONS
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