

Sprinkler Inspections and Investigations

Purpose

This information sheet outlines the requirements of National Fire Protection Association (NFPA) 25 as it relates to fire sprinkler system internal pipe inspections and obstruction investigations.

Applicable Standard

The 2011 edition of NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.

Background

NFPA 25 contains requirements for annual inspections, internal pipe inspections and obstruction investigations. There has been some confusion as to what is actually required for these various activities.

Annual Inspection

Minnesota State Fire Code (MSFC) Section 901.6 requires an annual inspection of fire sprinkler systems. NFPA 25 outlines the tasks that are to be accomplished on these annual inspections.

Internal Inspections vs. Obstruction Investigation

The internal pipe inspections and obstruction investigations are two separate tasks. The internal inspection of piping has a frequency of every five years as indicated in NFPA 25 Section 14.2.1. However, the obstruction investigation has no time limit and is initiated when any of the listed 14 conditions in NFPA 25 Section 14.3.1 are present.

Internal Inspection of Piping

An internal inspection of piping and branch line conditions shall be conducted every five years. The purpose of this inspection is to check for the presence of sufficient corrosion or foreign material capable of obstructing sprinklers and rendering the system ineffective in the event of a fire. Internal inspections are important if there is reason to believe that foreign material exists in the water supply or if the supply is from a stored or raw water source. These internal inspections are especially critical for dry-pipe and pre-action sprinkler systems.

This “internal inspection of piping” is a “visual” inspection, completed every five years, on one main and one branch line. The 2014 Edition of NFPA 25 further clarified this section by changing the word “inspection” to “assessment” and excludes nonmetallic pipe from the assessment. The purpose of this assessment is to look for the presence of foreign material (both organic and inorganic). A substantial amount of explanatory information was placed in Annex A of NFPA 25 (2014 edition) to clarify the intent and actual requirements.



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If no such material is seen, then the system is returned to service. If there is slime or turbercules, Section 14.2.1.2 states the system must be tested for indication of microbiological influenced corrosion (MIC). Note: The standard does not say the line has to be treated for MIC since one option in NFPA 13 is simply to monitor the situation.

The NFPA 25 Handbook (2011) explains that the inspection “is not intended to place an additional burden on the property owner by requiring an additional inspection every five years. Rather, the inspection required by 14.2.1 should be coordinated with the internal inspection requirement of system valves, such as is required by 13.4.1.2 for alarm valves.”

Fire protection contractors and business owners should consider having the internal pipe assessment or inspection conducted at the same time as the annual inspection or when the fire sprinkler system is undergoing any alterations, additions, renovations, or repairs to save the cost of separate inspections.

Guidance is explicitly indicated in Section 14.2.1 that an inspection of piping is completed by opening a flushing connection at the end of one main (most likely the cross main) and by removing a sprinkler toward the end of one branch line to look for any type of foreign material. When this section says a flushing connection and a sprinkler it does indeed mean just one of each.

There are additional guidelines added to the 2011 edition of NFPA 25 regarding inspections of dry pipe systems, pre-action systems, and cross mains in Section 14.2.1.5 and 14.2.1.6.

For large warehouses, high-rise buildings and other buildings with multiple wet pipe systems, Section 14.2.2 through 14.2.2.2 requires every other system to have an internal inspection every five years as described in Section 14.2.1. If no evidence of material is found, then every other system would be inspected every 10 years. If foreign organic and/or inorganic material is found in any system during the five year inspection, then all systems shall have an internal inspection at that time.

Obstruction Investigation

An obstruction investigation is conducted when any of the 14 conditions identified in Section 14.3.1 is found to exist. For example, there were some systems installed for only a few years that have experienced pinhole leaks. This is a condition listed to initiate an obstruction investigation and obstruction prevention program. These 14 conditions can show up at any time. When a system does not exhibit any of the 14 conditions listed under Section 14.3.1, then only the internal inspection of piping or “visual” inspection discussed earlier shall be completed every five years.

When one of the 14 conditions identified in 14.3.1 exists; then Section 14.3.2 initiates an investigation. Section 14.3.2.2 has four specified locations for the visual inspections: (1) System valve, (2) Riser, (3) Cross main, and (4) Branch line. This section doesn't specify how many branch lines should be opened, but the Handbook commentary indicates that the intent is to open a representative number of branch lines as opposed to every branch line in the system.

If this investigation identifies conditions that could cause obstructions, then Section 14.3.3 dictates that a complete flushing program shall be conducted. Although it is not stated, it certainly is



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reasonable to allow one to first determine the extent of the problem by further visual inspections completed according to Section 14.3.2.2 and modify the flushing process accordingly.

Additional information in regard to Obstruction Investigation is located in Annex D. In Annex Section D.3.2 it states, "Generally a system can be considered reasonably free of obstructing material, provided the following conditions apply: (1) Less than ½ cup of scale is washed from the cross mains. (2) Scale fragments are not large enough to plug a sprinkler orifice. (3) A full, unobstructed flow is obtained from each branch line checked."

It is the opinion of the Minnesota State Fire Marshal that non-compliance or failure of any of the above three conditions outlined in Annex Section D.3.2 triggers the establishment of a flushing program. Once again, it is important to note that this information applies to the obstruction investigation as dictated by Section 14.3.1 and not the internal inspection required every five years per Section 14.2.1. As such, it requires one of the 14 conditions identified in 14.3.1 to exist to initiate an obstruction investigation and possibly a subsequent flushing program.

If you have any questions or need additional information, please feel free to contact the Minnesota State Fire Marshal's Fire Protection section at 651-201-7207 or via email: fm.fire.sprinklers@state.mn.us.

