



Facilitator — October/November 2011



Change Language: Choose



Text Size A | A | A

All translations are provided for your convenience by the Google Translate Tool. The publishers, authors, and digital providers of this publication are not responsible for any errors that may occur during the translation process. If you intend on relying upon the translation for any purpose other than your own casual enjoyment, you should have this publication professionally translated at your own expense.

Help From Above

Bob Guthrie

An introduction to sprinkler components and inspections

Inspection, testing and maintenance of your life safety systems are important elements of a comprehensive plan for protecting life and property. Most jurisdictions adhere to the prescribed requirements in National Fire Protection Association Standard for inspection, testing and maintenance of water-based fire protection systems (NFPA 25), though many do not enforce the reporting of daily, weekly and monthly inspections. The most common inspection intervals are quarterly and annual.

Inspection, testing and maintenance can take different paths depending on the type of sprinkler system installed.

But most will follow a similar pattern:

Inspection and operation of the system control valves and valve components

Inspection of alarm devices

Inspection of the fire department connection

Inspection of piping

Inspection of the sprinklers

Before the inspection, the technician will request that the central station monitoring service put the alarm system into test mode (if applicable). This will ensure that signals initiated by the inspection process and received at the central station do not result in a false alarm that is sent to the fire department. With the alarm system in test mode, the inspection usually begins in the sprinkler riser room.

System Control Valves and Valve Components

The system control valves must be inspected and tested to ensure the valve will open and close freely. If the water supply control valve is electronically supervised, the valve tamper switch will send a supervisory signal to the fire alarm control panel within the first two revolutions of closing any such valve. This ensures notification is received at the fire alarm control panel in the event the valve is not fully opened.

System gauges must be inspected, with the indicated pressures recorded on the inspection form. The age of the gauge should be noted; gauges more than 5 years old are required to be replaced or calibrated to within 3 percent accuracy.

The system gauges should be inspected prior to conducting the main drain test, which determines if the city or upstream valves are fully open with sufficient water supply and pressure to operate the sprinkler system. If not, there may be an obstruction in the pipe supplying the sprinkler system.

The gauge pressure must be recorded prior to the opening of the main drain. Open the main drain valve to create dynamic conditions. With water flowing, read the gauges to determine if there is a drop in pressure, which can indicate a water source problem.

While in the riser room, ensure the spare sprinkler cabinet has the proper number and type of spare sprinklers and the proper sprinkler wrench. Extra sprinklers may be necessary in the event of a fire. After the sprinkler system activates, these spare sprinklers can be installed to quickly place the system back into service. The sprinkler riser room must also be inspected for sufficient means of heat during cold temperatures to prevent system freezing.

Inspecting Alarm Devices

Several different types of waterflow alarm devices can be utilized in a fire sprinkler system. The main objective is to notify people not to enter the building and to call for help.

The waterflow switch is located on the sprinkler system riser, but the valve that activates the waterflow alarm during an inspection will normally be located remotely from the riser. This valve is called the inspector's test connection or test valve. It must be opened fully and the waterflow should activate the flow alarm within 90 seconds from a full flow of water. This test simulates the flow from one sprinkler head. It should ring a local mechanical or electric bell and, if connected to a fire alarm control panel, will also initiate local notification via horns and/or strobes within the building.

If the fire alarm control panel is monitored by a central station monitoring service, this signal results in the dispatch of the fire department, which is why the fire alarm system is put into test mode prior to a fire sprinkler system test.

Inspecting the Fire Department Connection

The fire department connection on most systems will be located close to the sprinkler system riser on the exterior of the building. The connection should be maintained in good working condition and in plain view for the fire department.

In the event of a fire, firefighters will use the fire department connection to connect the building's sprinkler to their pump truck and to a fire hydrant. This procedure increases the flow volume and pressure of water to suppress the fire. The fire department connection should always be equipped with protective caps to keep debris, animals and obstructions from entering the piping. The swivel connectors must be capable of smooth, free movement for the fire department to connect.

Inspecting Piping

The sprinkler system piping and supports can be visually inspected from the floor. Missing or bent piping, hangers and supports must be identified for repair.

The hydraulic nameplate also needs to be inspected quarterly during the piping and supports inspection. The nameplate gives the basic criteria for the design of the sprinkler system when it was installed. It should be referenced during the inspection to determine whether the water supply has deteriorated beyond the point that the system will be effective during a fire.

If the hydraulic nameplate is not present, it must be recreated. The most cost-effective method is locating the original sprinkler installation plans and obtaining the data from those drawings. The alternative is to recalculate the system through performing a survey in the field and new hydraulic calculations, but this method is time consuming and can be expensive.

Inspecting the Sprinklers Themselves

As with the piping, sprinklers can also be inspected from the floor. Sprinklers need to be inspected for damage, corrosion, loading of foreign material and paint.

Sprinkler damage usually comes in the form of a bent deflector. This is the part of the sprinkler that distributes the water and sizes the water droplets in a precise manner. Sprinklers are designed and tested to obtain a UL listing, and it is very important that the sprinkler be maintained in "as manufactured" condition.

Beware of sprinkler loading or foreign material, which can include grease, lint/dust or any other substance that could delay the activation of the sprinkler. The sprinkler relies on a heat-sensitive operating element to activate, releasing water from the pipe through the sprinkler head when the operating temperature is reached. The loading of a sprinkler can delay activation and can be detrimental to the control of a fire.

Paint is a common problem with sprinkler heads because it can delay the sprinkler's activation time by insulating the operating element from the surrounding heat. Corrosion can also delay the response time or prevent the sprinkler from discharging water by seizing the water seal in place, rendering the sprinkler inoperable.

According to NFPA 25, any sprinkler that has signs of loading, damage, corrosion or paint must be replaced. Sprinklers are not allowed, by NFPA standards, to be cleaned. Each type of sprinkler (fast response, extra high temperature, dry type, etc.) has a specific lifespan, after which it is required to be replaced. Alternatively, a representative sample of the sprinklers can be submitted to a recognized testing laboratory for testing at the end of their respective lifespan.

Maintaining your fire sprinkler system is an important part of minimizing the risk to life and property. For more information about properly maintaining your fire sprinkler system, visit the National Fire Protection Association website at www.nfpa.org. Copies of NFPA 25, "The Standard for Inspection, Testing and Maintenance of Water-Based Fire Protection Systems," can be purchased from this site.

[View All Articles](#)
