

This issue of TechNotes was written by Vince Powers, ITM Specialist at the NFSA.

## The Problem

Lack of proper maintenance is one of the leading reasons for fire sprinkler system failures. Fire sprinkler systems shall be properly inspected, tested, and maintained (ITM) in accordance with NFPA 25, *Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*. Systems exposed to cold weather are especially vulnerable.



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## How to prevent freezing problems

During cold months, these systems are more susceptible to catastrophic failure. Frozen sprinkler pipes are among the more common service calls throughout winter months. Maintaining a minimum of 40 degrees (F) is imperative in ensuring the sprinkler pipes do not freeze. Many areas that go unnoticed during the summer can create issues in cold months, these areas include, but are not limited to, entry ways, vestibules, stairwells, unoccupied spaces, skylights, and areas that are not properly insulated.

Sprinklered areas that cannot be maintained at 40 degrees (F) or above are usually protected with a dry pipe or antifreeze system. These types of systems may require more thorough assessments and routine maintenance to keep the systems from freezing. Antifreeze systems should be tested prior to the onset of freezing weather to verify that the antifreeze solution will protect to the anticipated temperatures for the region where the systems are installed. If they cannot protect to the required temperatures, they must be drained and provided with a new listed antifreeze meeting the requirements of NFPA 25, Section 5.3.4.



## Required maintenance

Wet portions of the dry pipe valve must be maintained at a minimum of 40 degrees (F) and the enclosure must be inspected daily to verify minimum temperature is maintained, and weekly if the room is equipped with a low-temperature alarm. The low point and auxiliary drains are required to be drained after each operation of the system, before the onset of freezing weather, and as needed after that. How often these drains shall be operated throughout the cold season will depend on how much condensation is in the drain. This could be a daily, weekly, or monthly requirement, based on the existing system and building conditions.

The 2020 edition of NFPA 25, Section 13.4.5.3.2 highlights the above requirements and the annex sections explains the importance of this procedure and gives some valuable insight to this basic step of dry pipe system maintenance.

Section A.13.4.5.3.2 states the following:

- Removing water that may collect in a dry system is essential to a maintenance program.
- Failure to drain water from dry systems may lead to damage to the system and the building and expensive repairs may be needed.
- A program to monitor the system and the needed operation of all auxiliary drains should be in place.
- After a dry system operates, the auxiliary drains should be operated every day and once there have been several days with no water discharge, the frequency of auxiliary drain operation can be decreased to weekly or longer intervals as appropriate.
- When preparing for freezing temperatures, the auxiliary drains should be operated daily with the frequency of operation decreasing, depending on the discharge of accumulated water.
- Quick opening devices where present, should be temporarily removed from service prior to draining the system Low Points.



1. Close upper valve.
2. Open the lower valve and drain the accumulated water.
3. Close the lower valve, open the upper valve, and allow for additional water accumulation.
4. Repeat this procedure until water ceases to discharge.
5. Replace plug or nipple and cap in lower valve.



## Conclusion

Cold weather causes issues in all industries, in the fire protection industry it can wreak havoc. When not properly maintained, fire protection systems can freeze, burst, and fail to function entirely if needed. It is extremely important to ensure that these systems are properly maintained to ensure they are ready to operate in the event of an emergency.



## Layout Technician Training



### Layout Technician Training

The purpose of the layout technician course is to take a person with basic knowledge of math, physical science and drafting skills and teach them to be productive basic sprinkler layout and detailing technicians. All of the work elements necessary for NICET Level II Certification will be covered by the course including sprinkler selection, sprinkler spacing and location, obstructions to sprinklers, water supplies (public mains, tanks and pumps), hydraulic calculation of sprinkler systems, and standpipe system layout and calculation.

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## New EOD Process

Starting on July 15, 2020, the NFSA has a new EOD process where members can submit questions, track the progress, and view their EOD cases. The step by step process is detailed in [TechNotes #442](#).

### National Fire Sprinkler Association

514 Progress Dr, Ste A,  
Linthicum Heights, MD 21090  
1-800-683-NFSA (6372)



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