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2016 Edition of NFPA 13 and New Requirements for Air Venting

The recently released 2016 edition of NFPA 13 includes a new requirement that all wet pipe systems utilizing metallic pipe be equipped with a single air vent. The intent of this new requirement is to reduce (not eliminate) the amount of air trapped in the system in order to mitigate oxygen induced corrosion of the piping system.

The NFSA, at the direction of NFSA's Engineering and Standards Committee, unsuccessfully resisted this new requirement both at the committee level and with a Certified Amending Motion at the June Technical Meeting. The NFSA did not resist this requirement due to an indifference to the problem of corrosion but rather due to the belief that air vents should be provided where they would prove effective. This is best accomplished by allowing the experts (design technicians, engineers, and owners) who are familiar with the specific characteristics of a particular system to determine where and when air venting should be included.

The NFSA substantiation to reject this new requirement was as follows:

The NFSA E&S committee does not support a blanket requirement for air vents on all wet pipe systems utilizing metallic pipe. While the proposed air vents may be appropriate for some systems to help reduce corrosion issues, venting will not improve the conditions for all wet systems. The decision to provide these vents should be determined on a site specific basis by those familiar with specific issues affecting the systems. This decision should be made by the engineer of record, design technicians or the owner. Removing some air from a wet pipe sprinkler system will not solve corrosion issues. It will simply move the water/air interface to another location in the system. We cannot offer a solution to potential corrosion issues until we fully understand the problem. The annex note A.8.16.4.2.2 (2013 edition) currently provide information to the user when air venting is deemed to be warranted.

It is important to note that the NFSA is sensitive to corrosion issues and supports reasonable steps to reduce the issues of corrosion in sprinkler systems. While it is true that the new air vent requirement will likely be effective in certain systems, it is not as clear that all systems will benefit from this new requirement. The concept of air venting is not new to NFPA 13 and has been an option, when warranted, in past editions of the standard. See NFPA 13 – 2013 section A.16.8.4.2.2. The change in the 2016 edition is to apply air venting to all wet pipe systems with

metallic piping and not just to systems where it is determined that based upon specific conditions and configurations that an air vent will be effective in reducing corrosion.

Since the 2016 edition includes air venting requirements it is important for us as an industry to understand exactly what is required and just as importantly what is not required. The requirements are certainly not draconian and in the end should not prove to be an undue burden on the contractor or on the owner.

The base requirement is found in chapter 7 in section 7.1.5 and reads:

7.1.5 Air Venting. *A single air vent with a connection conforming to 8.16.6 shall be provided on each wet pipe system utilizing metallic pipe. (See A.8.16.6.)*

This section is clear that all wet pipe sprinkler systems installed in accordance with the 2016 edition of NFPA 13 and using metallic pipe require the inclusion of an air vent.

Section 7.1.5.1 reads as follows:

7.1.5.1 Venting from multiple points on each system shall not be required.

This section clarifies that it is not required to vent from multiple locations in a system. A single vent per system is all that is required. Starting in the 2013 edition of NFPA 13, the definition of a system was changed to clarify that a system is the piping that includes a water supply source, a control valve, a waterflow alarm and a drain. This means that each floor of a multi-story building with a floor control valve assembly is considered a separate system. As many buildings will include multiple systems each with their own air vent, these buildings will include multiple air vents. However each individual sprinkler system will only be required to include a single vent.

Section 8.16.6 indicates the type of vent required and location guidance for this vent. This section reads:

8.16.6* Air Venting. *The vent required by 7.1.5 shall be located near a high point in the system to allow air to be removed from that portion of the system by one of the following methods:*

- (1) Manual valve, minimum 1/2 in. (15 mm) size*
- (2) Automatic air vent*
- (3) Other approved means*

The vent itself may be 1/2 inch or larger manual valve, an automatic air vent or any other means acceptable to the AHJ. These requirements, at their core, state that any means that will allow air to be vented from the system is permitted. There is quite a bit of discretion for the designer to specify the type of vent that will best meet the air vent requirement based upon the particulars of the system.

Besides the type of vent allowed, section 8.16.6 includes two other important pieces of information.

First, it requires that the air vent be located “*near a high point in the system*”. It does not say at the high point. This is an important distinction and one that may be a point of confusion and/or contention between designers, installers and AHJs. The wording “near” is intentionally vague to allow for a reasonable application of this requirement. There may be disagreements on what constitutes “near a high point”. Perhaps it would be wise to include the AHJ in the discussion on where to locate the vent. This discussion may prevent costly and time-consuming disagreements during the acceptance phase of the project.

Related and equally important language of this section is that this vent is to allow “air to be removed” from the system. It does not say all air is to be removed. The point of this vent is to reduce the amount of air in the system, not to eliminate all air from the system.

Perhaps the best resource for understanding these new requirements is found in the annex section A.8.16.6. As stated earlier, this annex section is not new to NFPA 13 and was found in earlier editions (A.8.16.4.2.2 in the 2010 and 2013 editions). This explanatory material highlights some important concepts:

- Air venting is a reasonable approach to reduce corrosion activity by reducing the amount of trapped oxygen that will fuel corrosion and microbial activity.
- It is not the intent to exhaust to exhaust all trapped air. This would not be practical.
- It is the intent to vent the wet pipe system every time the system is filled.
- Multiple vents are allowed but are not required.
- Interconnection of branch lines is not required.
- The inspector’s test valve may serve as the vent. It is important to note that the test connection is not typically located at a high point on the system and would not be effective as a venting location. Recent editions of NFPA 13 allows the inspector’s test connection to be located anywhere downstream of the water flow device. One reason for this change is that when this connection is located at the remote portion of the system fresh oxygen is introduced into the system every time the alarm is tested which increases the corrosion. When this test connection is located at the base of a riser, it is not at a high point and cannot be used as the required air vent. Similarly, even when the ITC is connected at a remote branch line the valve and test orifice is usually dropped to an assessable location and would not act as a high point of the system.
- The annex states that the vent should be located where it is to be most effective and should be located off the top of horizontal piping at a high point in the system. A vent connection can also be effectively located off the side of a riser or riser nipple at a high point in the system.
- Finally, manual vents should be located where accessible and preferable no more than 7 ft above the floor. Automatic air vents do not need to meet these accessibility requirements but should be located in areas with no ceilings, above a lay-in ceiling or above an access panel.

In summary, while the new air venting requirement included in the 2016 edition of NFPA 13 is a significant change to the standard, it is not a new concept or a particularly difficult requirement to adhere to. Corrosion is a significant issue for our industry and affects all stakeholders, including contractors, building owners and insurance companies. Although the air vents may not

prove to be a benefit to all wet pipe systems, the concept of removing freshly introduced air to reduce corrosion certainly has merit and may reduce at least some instances of very expensive corrosion repair.

The key to this new requirement is, as with all new concepts, to understand the reasoning behind the requirements and to ensure that all those involved are properly educated. It is not expected that air vents will eliminate all corrosion in wet pipe systems; it is one step in attempting to deal with this issue. It is, so to speak, another tool in our tool box to ensure the proven reliability of sprinklers systems is not compromised.