NFSA NATIONAL FIRE SPRINKLER ASSOCIATION
The Voice of the Fire Sprinkler Industry

TechNotes

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July 10, 2018
Written by Mark Hopkins, Vice President of Engineering

Best of June 2018

Following are a dozen questions answered by the engineering staff as part of the NFSA's Expert of the Day (EOD) member assistance program during the month of June 2018. This information is being brought forward as the "Best of June 2018." If you have a question for the NFSA EOD (and you are an NFSA member), send your question to eod@nfsa.org and the EOD will get back to you.

It should be noted that the following are the opinions of the NFSA Engineering Department staff, generated as members of the relevant NFPA technical committees and through our general experience in writing and interpreting codes and standards. They have not been processed as formal interpretations in accordance with the NFPA Regulations Governing Committee Projects and should therefore not be considered, nor relied upon, as the official positions of the NFPA or its Committees. Unless otherwise noted the most recent published edition of the standard referenced was used.

Question 1 - Use of Intermediate Temperature Sprinklers Throughout

Is there any prohibition to using intermediate temperature sprinklers throughout for an 8-story apartment building being designed based on the residential design approach of NFPA 13-2013?

Answer: The answer to this question is "no." The allowance to use intermediate temperature rated sprinklers throughout was first added to the standard in the 2010 edition of NFPA 13.

NFPA 13-2013 section 8.3.2.1 specifically allows the use of either ordinary or intermediate temperature rated sprinklers throughout buildings except as modified by the requirements of 8.3.2.2, 8.3.2.3, 8.3.2.3 or 8.3.2.5, which are generally indicating areas in need of higher temperature rated sprinklers.

> ***8.3.2.1**** *Unless the requirements of 8.3.2.2, 8.3.2.3, 8.3.2.4, or 8.3.2.5 are met, ordinary- and intermediate-temperature sprinklers shall be used throughout buildings.*

Upcoming Technical Tuesdays

July 24, 2018

NFPA 13, 2019 Edition, Reorganization Presented by Mark Hopkins, P.E., Vice President of Engineering

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Did You Know??

The NFSA keeps a member of the Engineering Department staff on duty every business day to answer your technical questions live. We call this the Expert of the Day (EOD) program and it is available to our members by phone, fax or e-mail. Call us at (845) 878-4200 and press 2, or you can send a fax to (845) 878-4215, or you can e-mail us at eod@nfsa.org. Last year we answered more than 2600 requests for assistance.

Section 8.3.2.1 permits the use of ordinary temperature sprinklers throughout, intermediate temperature sprinklers throughout, or a combination of ordinary temperature and intermediate temperature sprinklers to be used.

Question 2 - Use of Heat Tracing

Two questions have been asked regarding NFPA 13-2013 section 7.1.4 regarding the use of heat tracing in valve enclosures and 8.16.4.1.4.1 regarding the use of heat tracing on branch lines. Each question is addressed separately.

> ***7.1.4*** *Heat tracing shall not be used in lieu of heated valve enclosures to protect the valve and supply pipe from freezing.*
> ***8.16.4.1.4.1*** *Where used to protect branch lines, the heat-tracing system shall be specifically listed for use on branch lines.*

Question 2.1: Is it the intent of 7.1.4 to prohibit the use of heat tracing on all valves and supply piping?

Answer 2.1: The answer to this question is "no, this section only applies to wet pipe system riser and supply piping" Additional limitations are provided for other types of systems.

This section was introduced during the development of the 2013 edition as documented in the Report on Proposals A2012.

Recommendation: Add text to read as follows: 8.16.1.1.1.6 Heat tape shall not be used in lieu of heated valve enclosures to protect the valve and supply pipe from freezing.
Substantiation: Throughout NFPA 13, the only discussion about valve rooms occurs in Section 7.2.5.2, specifically regarding dry pipe system valves. Other riser valves serving other types of systems, such as wet, deluge, and preaction systems, need to be protected in a similar manner as dry pipe system valves are. This proposal copies the language from Section 7.2.5.2.3, and places that language into 8.16, where it will apply to all valves.
Committee Meeting Action: Accept in Principle Add to Chapter 7.1 for wet systems as new 7.1.4. Change "Heat tape" to "Heat trace"
Committee Statement: The requirement is more appropriate in chapter 7

The submitter's intent was to duplicate the language applicable to dry pipe system riser room for all riser types. It is not intended to apply elsewhere in the sprinkler system or in its water supply.

Question 2.2: Is it the intent of 8.16.4.1.4.1 to only permit heat tracing on branch lines when listed for that use?

Answer 2.2: The answer to this question is "yes, the intent of 8.16.4.1.4.1 is to only permit heat tracing on branch lines when the heat tracing system is specifically listed for use on branch

Upcoming In-Class Seminars

lines."

Question 3 - Friction Loss for Flow Switches

NFPA 13 section 23.4.4.8.1(1) requires flow switches in pipes 2 in. and smaller to have friction loss included in hydraulic calculations. When asked, one manufacturer provided a letter stating that a friction loss of 3 psi could conservatively be applied in accordance with UL Standard 346 for flow switches used in pipes up to and including 4 in. in size. However, this is a large pressure loss for some areas with poor water supplies.

Is there any research available that has been completed regarding friction through flow switches 2 in. and less in diameter?

Answer: The answer to your question is "yes," additional information can be found in the First and Second Draft Reports for NFPA 13-2019. Information was submitted as part of a public input (PI) which was submitted and accepted as First Revision (FR 807). This PI added, "Vane Type Flow Switches" to Table 23.4.1.1, titled "Equivalent Schedule 40 Steel Pipe Length Chart."

The following substantiation was provided:

Revise Table 23.4.3.1.1 as shown.

Substantiation: All flow switches are required to undergo a Hydraulic Friction Loss Test in accordance with Section 33 of UL Standard 346 - WATERFLOW INDICATORS FOR FIRE PROTECTIVE SIGNALING SYSTEMS. This friction loss test allows for up to 3 psi loss across the paddle for 4 in. and smaller sizes and 1 psi loss for sizes larger than 4 in. when subjected to a flow rate of 15 fps. The flow switch manufacturers have yet to publish their friction losses across these devices on their technical literature. These losses are not inconsequential, especially when compared to other values already within the Table. As with other fittings, valves and devices, the manufacturer is free to publish their specific pressure drop data to supersede the values within Table 23.4.3.1.1.

The added equivalent feet values are based on Schedule 40 pipe and a C-Factor of 120. Computations/worksheet attached.

As part of the Second Draft this table was moved to section 27 and is identified as Table 27.2.3.1.1. The following equivalent lengths are included for vane type flow switches:

Pipe Diameter (in.)	Equivalent Length (ft)

1	6
1 1/4	9
1 ½	10
2	14
2 ½	17
3	22
4	30

The table provides equivalent lengths for flow switches in 1 in. through 12 in. diameter pipes. You can download the entire table from the NFPA website at www.nfpa.org/13. Select the Next edition Tab, then select the Second Draft Report, and scroll down to Chapter 27 Plans and Calculations. The Table can be found by scrolling down to section 27.2.3.1.1.

Since there were no Certified Amending Motions (CAMs) presented at the Technical Meeting in June 2018 regarding this change, it is anticipated that this information will be included in NFPA 13-2019 which will be published in September 2018.

Question 4 - Use of ¾ in. Steel Pipe

Two questions have been submitted regarding the use of ¾ in. steel pipe in older existing sprinkler systems. Each question is addressed separately.

Question 4.1: When was 3/4 in. pipe last allowed in NFPA 13?

Answer 4.1: It appears that 3/4 in. pipe was removed from the pipe schedule tables of NFPA 13 in 1940. Although access to the 1940 edition of NFPA 13 is not available, the twelfth edition (1962) of the Fire Protection Handbook addresses this topic. This book states that the 1905 pipe schedule (known as the 1-2-3 schedule based upon the number of sprinklers allowed on the 3/4-inch, 1-inch, and 1 1/4-inch pipe sizes, respectively) was changed in the 1940 edition of the standard. For the 1940 edition, the Fire Protection Handbook states" In that year the Sprinkler Standard made a radical departure in eliminating 3/4-inch pipe for branch lines in order to improve water discharge at end sprinklers and to reduce the danger of clogging".
Question 4.2: Was 3/4-inch pipe ever allowed in hydraulically calculated systems?

Answer 4.2: Although insufficient documentation was found to back this up, there have been anecdotal accounts that early in the history of sprinkler system hydraulic calculations there was no mandated minimum pipe size. As a result, it is possible that early hydraulically calculated systems made use of 3/4-inch pipe.

Question 5 - Rooftop Hose Connections

Clarification was requested regarding NFPA 14-2016 as it applies to a building having three (3) stairways with only one (1) having roof access. A Class I standpipe is being provided in each stairway with hose connections on the main floor landings. Roof access is provided through a ships ladder

located in one of the stairways. A hose connection is provided at the highest landing of this stairway.

Does NFPA 14 section 7.3.2.9.2.1 require an additional hose valve on the roof?

Answer: The answer to your question is "no, the hose valve at the highest inside landing will meet the requirements of NFPA 14-2016." The charging requirement in section 7.3.2 identifies that where hose connections are required to be provided, hose connections are required to be located in accordance with the requirements of this section. The annex section A.7.3.2 explicitly states that only one standpipe is necessary to serve the roof regardless of travel distance and it is not the intent to extend each standpipe to the roof level.

> ***7.3.2* Class I Systems.*** *Where required to be provided, hose connections shall be located in accordance with 7.3.2.*
>
> ***A.7.3.2*** *Hose connections are now specified to be located at the main landing in exit stairways. Paragraph 7.3.2.1 permits hose connections to be located at intermediate landings where local fire-fighting tactics require this location. Only one standpipe is necessary to serve the roof regardless of the travel distances in 7.3.2.2; it is not the intent to extend each standpipe to the roof level.*
>
> *The approach to locating hose connections with respect to exits is shown in Figure A.7.3.2(a), Figure A.7.3.2(b), and Figure A.7.3.2(c).*

A hose connection at the highest landing of the stairway complies with the requirement of NFPA Section 7.3.2.7 since the stairway has access to the roof. Additional discussion is included in section A.7.3.2.7 which clarifies that a permanent ladder, permanent ladder rungs or a pull-down stair with a roof hatch would be considered as providing access to the roof.

> ***7.3.2.7*** *Hose connections shall be provided at the highest landing of stairways with stairway access to a roof.*
>
> ***A.7.3.2.7*** *Access to the roof can be via a stairwell that terminates at the roof level. Access could also be a permanent ladder, permanent ladder rungs, or a pull-down stair with a roof hatch. See Figure A.7.3.2.7 for an example of a roof outlet.*

Section 7.3.2.9 would only require a roof top hose connection in a stairway that does not provide access to the roof, if no standpipe is available for roof access. Based on the information stated in A.7.3.2 the hose connection provided in the stairway having access to the roof would be sufficient. This is confirmed in section 7.3.2.9.2, which identifies that an additional hose connection is not needed when a hose connection is installed at the top landing of a stairway having roof access in accordance with section 7.3.2.7. This hose connection installed at the top landing of the stairway also fulfills the requirement of section 7.3.2.9.2. The requirement of

section 7.3.2.9.2.1 would be inherently fulfilled since a hose connection has been installed in compliance with section 7.3.2.9.2.

> ***7.3.2.9*** *In stairways that do not access the roof, a hose connection shall be provided on the roof.*
>
> ***7.3.2.9.1*** *The hose connection required by 7.3.2.9 shall not be required where the roof slope is 4 in 12 or greater.*
>
> ***7.3.2.9.2*** *The hose connection required by 7.3.2.9 shall not be required where at least one hose connection in accordance with 7.3.2.7 is provided in the building.*
>
> ***7.3.2.9.2.1*** *Where there are no hose connections as provided by 7.3.2.9.2, a single hose connection shall be provided on the roof.*

A hose connection at the highest landing of the stairway complies with the requirements of NFPA 14. An additional hose connection on the roof level is not required.

Question 6 - Car Stacker Protection

A project involving a basement level parking garage fitted with a two-level 'car stacker' has been identified. The proposed sprinkler system was designed to Ordinary Hazard Group I (OH1) as suggested in NFPA 13-2016 section A.5.3.1 for "automobile parking and showrooms," and as typical for parking garages. In addition to the ceiling sprinklers, sidewall sprinklers have been added under the obstruction created by the car at the upper level in accordance with the 'wide obstruction' rules of NFPA 13.

> ***A.5.3.1*** *Ordinary hazard (Group 1) occupancies include occupancies having uses and conditions similar to the following:*
> *(1) Automobile parking and showrooms*
> *....*

Is this arrangement permissible under NFPA 13-2016 requirements?

Answer: The answer to your question is "yes, this is one permissible option under the standard". During the development of the 2016 edition, NFSA introduced a proposal to permit the use of Extra Hazard Group 2 (EH2) coverage as an alternative that would not require additional sprinklers below the car at the upper level. The rationale for this proposal is that EH2 is provided in occupancies "where shielding of combustibles is extensive" such as the case where the car at the lower level is shielded by the car above.

> ***5.4.2* Extra Hazard (Group 2).*** *Extra hazard (Group 2) occupancies shall be defined as occupancies or portions of other occupancies with moderate to substantial amounts of flammable or combustible liquids or occupancies where shielding of combustibles is*

extensive.

This proposal was accepted, and two-level car stackers were added to the EH2 list in A.5.4.2.

> ***A.5.4.2*** *Extra hazard (Group 2) occupancies include occupancies having uses and conditions similar to the following:*
> *....*
> *(9) Car stackers and car lift systems with 2 cars stacked vertically*

However, the choice remains to either (1) provide the typical OH1 ceiling coverage with additional sprinklers provided below the obstructions created by the car at the upper level or (2) to provide the permitted EH2 ceiling coverage without regard for the obstructions below. Either choice is permissible and should be based on factors including the specific design of the stacking system and the available water supply.

Question 7 - Attachment of Sprinkler Escutcheons

A fire sprinkler system is being installed in a dog food manufacturing plant and semi-recessed sprinklers are being used. This facility will be using water pressurized at approximately 100 psi to wash the room including the ceilings. Concern has been expressed about the water pressure knocking off the outer ring of the escutcheons.

Is it acceptable to use two small screws to attach the escutcheons to the insulated metal panel that is being used as the washable ceiling?

Answer: The answer to your question is "no", sprinklers such as recessed, concealed and flush-type sprinklers receive a listing for the sprinkler and escutcheon as an assembly. This provision is found in NFPA 13-2016, section 6.2.7.2 which reads:

> ***6.2.7.2**** *Escutcheons used with recessed, flush-type, or concealed sprinklers shall be part of a listed sprinkler assembly.*

Since the sprinkler needs to be installed in accordance with its listing, and since the listing includes an escutcheon, the sprinkler needs to be installed with the correct escutcheon and in accordance with the manufacturer's instructions. The manufacturer's instruction would not include a provision to screw the escutcheon to the ceiling.

A related section of the standard would be section 6.2.7.4 which prohibits the use of caulking or glue on the escutcheon of the sprinkler. Although this section is specific to glue or caulk and not screws, it would be reasonable to state that affixing the escutcheon with screws is also prohibited. This section reads:

> ***6.2.7.4*** *The use of caulking or glue to seal the penetration or to affix the components of a recessed escutcheon or*

concealed cover plate shall not be permitted.

On a related note, if the concern is that the water spray may knock off the escutcheon, there would also be concern that the water spray at 100 psi may damage the sprinkler itself. It is suggested to consider discussing this issue with the owner with consideration given to developing procedures to ensure the sprinklers are not damaged during cleaning operations.

Question 8 - Sprinkler System Alarm Response Time

Clarification was requested regarding the allowable time between water flowing from the inspector's test connection on a wet pipe system and the sounding of local alarms on the premises. It was identified that NFPA 13-2016 section 25.2.3.1 requires an audible alarm within 5 minutes of water flow from the inspector's test connection. It was also identified that NFPA 72-2016 section requires activation of the initiating devices within 90 seconds of waterflow from the inspector's test connection.

It was identified that the 90 second limitation of NFPA 72 section 17.12.2 would be the maximum allowable lag between the activation of the waterflow switch (initiating device) and the issuance of the electronic signal to the FACU, which would correspond to the maximum retard setting on most waterflow switches. It was also stated that the 90 second limitation does not specifically state that audible alarms will sound within 90 seconds of water flow.

Are these conflicting requirements or is there more to it?

Answer: The answer to your question is "no, there is no conflict. The requirements of NFPA 13 and NFPA 72 are different, not conflicting."

NFPA 13-2016 requirements regarding wet pipe sprinkler system alarm times are included in sections 6.8.1 and 25.2.3.1.

> ***6.8.1 General.*** *Waterflow alarm devices shall be listed for the service and so constructed and installed that any flow of water from a sprinkler system equal to or greater than that from a single automatic sprinkler of the smallest K-factor installed on the system will result in an audible alarm on the premises within 5 minutes after such flow begins and until such flow stops.*
>
> ***25.2.3.1 Waterflow Devices.*** *Waterflow detecting devices including the associated alarm circuits shall be flow tested through the inspector's test connection and shall result in an audible alarm on the premises within 5 minutes after such flow begins and until such flow stops.*

The 5-minute time requirement of NFPA 13 sections 6.8.1 and 25.2.3.1 acknowledge that water supplies surges can result in higher sprinkler system pressure than supply pressure. The surge pressure is locked in the sprinkler system by the system alarm or riser check valve. This is often observed when

comparing the pressure on the system and supply sides of alarm check valves and riser check valves. Operation of the inspector's test valve will result in water discharge from the system piping downstream of the check valve until the pressure drops below the supply pressure thus allowing water flow past the water flow switch. The 5-minute time requirement would allow for operation of sprinkler systems having large water volumes and longer duration consistent with an operating sprinkler.

NFPA 72-2016 requirements regarding wet pipe sprinkler system alarm times are included in sections 17.2.1 through 17.2.3.

> ***17.12 Sprinkler Waterflow Alarm-Initiating Devices.***
>
> ***17.12.1**** *The provisions of Section 17.12 shall apply to devices that initiate an alarm indicating a flow of water in a sprinkler system.*
>
> ***17.12.2**** *Activation of the initiating device shall occur within 90 seconds of waterflow at the alarm-initiating device when flow occurs that is equal to or greater than that from a single sprinkler of the smallest orifice size installed in the system.*
>
> ***17.12.3*** *Movement of water due to waste, surges, or variable pressure shall not initiate an alarm signal.*

The requirement of NFPA 72 section 17.12.2 indicates that activation of the initiating device shall occur with 90 seconds of waterflow at the alarm initiating device when waterflow equal to or greater than that from a single sprinkler of the smallest orifice size installed in the system. The key with the NFPA 72 requirement is that it explicitly identifies waterflow at the flow switch and not at the inspector's test connection. This allows for the installation of flow switches having capability of up to 90 second retard settings to be used to avoid nuisance alarms associated with pressure surges. The 90 second timeframe starts when water flows past the alarm initiating device as stated in section 17.12.2. This 90 second timeframe is a part of the overall 5-minute timeframe identified by NFPA 13.

The difference relates to when the timeframe starts. For NFPA 13, the time starts when the inspector's test connection valve is opened, and water flow is achieved. An audible alarm signal must be received on premises within 5 minutes. NFPA 13 allows for use of a water motor gong or local alarm bell in some instances. This 5-minute requirement would apply to a local alarm or a flow switch used as an initiating device as part of a fire alarm system. When used as part of a fire alarm system and NFPA 72 is applicable, the alarm must be initiated within 90 seconds of water flow at the flow switch. This would mean that the time lags associated with water discharge due to overpressure, time lags associated with fire alarm system signaling (poling of the system), or time lags due to some other cause, cannot have an aggregate time lag exceeding the overall 5-minute limitation of NPFA 13 and the 90 second limitation of NFPA 72. Using the maximum values, an aggregate time lag of 3 ½ minutes would be permitted and still

be compliant with both NFPA 13 and NFPA 72.

Question 9 - Seismic Bracing Calculations

A gridded sprinkler system is composed of 6-inch cross mains connected by 3-inch branch lines that are 82 feet in length. Each branchline is provided with 2 ft. 9 in. riser nipples at the connection to each main. Each branchline has been provided with two lateral sway braces as required by NFPA 13-2013 section 9.3.5.5.1 spaced approximately 30 feet from each cross main.

> ***9.3.5.5.1**** *Lateral sway bracing shall be provided on all feed and cross mains regardless of size and all branch lines and other piping with a diameter of 2.5 in. (65 mm) and larger.*

Are branch lines required to be included in the zone of influence (ZOI) calculations required for the lateral braces on the cross mains?

Answer: The answer to your question is "yes, as per 9.3.5.9.6 because the branch lines are not provided with longitudinal bracing".

> ***9.3.5.9.6**** *The zone of influence for lateral braces shall include all branch lines and mains tributary to the brace, except branch lines that are provided with longitudinal bracing or as prohibited by 9.3.5.9.6.1.*

Note that the riser nipples must meet the requirements of 9.3.5.9.6.1 or longitudinal sway braces must be added to the branch lines. If they are added, then the branch lines would not be included in the lateral sway brace calculations for the cross main.

> ***9.3.5.9.6.1**** *When riser nipples are provided in systems requiring seismic protection, they shall satisfy the following equation, unless one of the following conditions is met:*
>
> *(1) Where riser nipples are 4 ft (1.2 m) or less in length and Cp is 0.50 or less*
> *(2) Where riser nipples are 3 ft (900 mm) or less in length and Cp is less than 0.67*
> *(3) Where riser nipples are 2 ft (600 mm) in length or less and Cp is less than is 1.0*

$$\frac{(H_r \cdot W_p \cdot C_p)}{S} \geq F_y$$

[9.3.5.9.6.1]

> *where:*
>
> *Hr = length of riser nipple piping (in inches)*
> *Wp = tributary weight (in pounds) for the branch line or portion of branch line within the zone of influence including the riser nipple*

Cp = seismic coefficient
S = sectional modulus of the riser nipple pipe
Fy = allowable yield strength of 30,000 psi (2070 bar) for steel, 30,000 psi for copper (soldered), 8000 psi (550 bar) for CPVC

***9.3.5.9.6.2** If the calculated value is equal to or greater than the yield strength of the riser nipple, the longitudinal seismic load of each line shall be evaluated individually, and branch lines shall be provided with longitudinal sway bracing per 9.3.5.6.*

Question 10 - In-Rack Sprinkler System Connections

In a building containing three (3) ceiling level sprinkler systems, there is an in-rack sprinkler system below ceiling sprinkler system #2. NFPA 13-2010 section 8.16.1.6.3 allows an in-rack sprinkler system (over 20 sprinklers) to be installed with a sectional control valve and connected to the ceiling sprinkler system. Two questions have been asked which have been answered separately.

Question 10.1: Can the in-rack sprinkler system be connected to an adjacent ceiling sprinkler system? Specifically, can the in-rack system under ceiling system #2 be connected to System #1.)

Answer 10.1: The answer to your question is "yes, there is nothing in NFPA 13-2010 section 8.16.1.6 that would limit the in-rack sprinkler system to the ceiling system directly above. The purpose of having a separate control valve for the In-rack system is to allow the ceiling system to remain in service while the in-rack system is serviced, tested or repaired. This is necessary since in-rack systems often experience damage from fork lifts and other material handling equipment. Based upon this it would not matter if the in-rack system was connected to the system above or an adjacent system.
.
Question 10.2: Can the combined area of ceiling sprinkler system #1 and the in-rack system located below system #2 be allowed to exceed 40,000 sq.ft.?

Answer 10.2: The answer is "yes", but as this situation is not directly addressed in the standard, I would suggest that the AHJ be consulted. The purpose of area limitations for a single system is based upon the maximum floor area protected by a single system that may be out of service. This is based upon the judgement that it would be better to limit the maximum area to 40,000 sq. ft (for storage) that might be unprotected due to a system being impaired. The in-rack system is not intended to provide floor area protection and as it is in essence (if not by definition) a separate system from that of the ceiling system.

Question 11 - Main Drain Sizing

Two questions have been asked regarding main drain sizing which have been answered separately.

Question 11.1: An example was cited where a 2 in. drain for a 6 in. riser is located 30 to 40 feet from the exterior wall. A request was made to increase the drain size due to the length of the drain piping.

Is it required to upsize a main drain pipe because of pipe length distance?

Answer: The answer to your question is "no, there is no specific requirement based on pipe length or distance." NFPA 13-2016 Table 8.16.2.4.2 provides minimum drain sizes based on riser or main sizes served. However, it is also important to recognize that the minimum sizes indicated in Table 8.16.2.4.2 also include the words "or larger." (This language was new in in the 2016 edition). It is also important to recognize that section 8.16.2.4.8 requires drain risers to be sized one size larger than each drain tying into it.

Question 11.2: A 4-story building with a 6 in. water service that feeds a standpipe system having a 4 in. standpipe and a second 4 in. combination riser has been identified. The combination riser supplies a 3 in. floor control valve assembly on each floor having a 1 ¼ in. drain tying into a 2 in. express drain riser. The 2 in. drain riser runs back to the system riser where it ties into the 2 in. main drain and exits the building 10 ft. away. There are no pressure reducing valves. An opinion was stated that there would be no need to upsize the drain since the express drain riser is more than one size larger than the floor control valve drains tying into it in accordance with NFPA 13-2016 section 8.16.2.4.6.

Would the connection of the 2 in. main drain to the express drain piping require the entire drain riser to be increased in size, would the last 10 ft of drain pipe exiting the building need to be increased in size, or should the express drain remain 2 in.?

Answer: The answer to your question is "no upsizing is required. The drain can remain 2 in." NFPA 13 section 8.16.2.4.4 identifies that drains shall be designed to discharge outside or to a drain connection capable of handling the flow of the drain. The express drain riser is permitted to remain 2 in. until it discharges to the exterior of the building or to a drain. The 2 in. main drain for the system is not required to be increased and can exit the building as a 2 in. drain. Simply connecting the 2 in. express drain and the 2 in. system main drain would not require the last 10 ft of interior drain pipe to be increased in size. This could be considered if more than one system will ever need to be simultaneously drained. However, the main drain connection would not trigger a need to increase the express drain size to 2 ½ in. diameter. This configuration is simply limiting the number of exterior drains for the building.

Question 12 - NFPA 25 Antifreeze System Internal Inspections

It was stated that NFPA 25-2017 section 14.2.1 requires internal inspections be performed on "all four types of system -

wet, dry, preaction, and deluge".

Are antifreeze systems classified under one of these types of systems, and therefore also required to have internal inspection every five years?

Answer: The answer to your question is "yes", antifreeze systems are a type of wet pipe system and would require an internal condition of piping assessment at a minimum of 5 years.

Antifreeze systems are defined in Chapter 3 of NFPA 25-2017 and specifically identifies an antifreeze system as a type of wet pipe system. This definition reads as follows:

> ***3.6.4.1 Antifreeze Sprinkler System.*** *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.*