NFSA The Voice of the Fire Sprinkler Industry

TechNotes

Editor-Victoria B. Valentine **Issue# 302** **September 23, 2014**

Best of August 2014

Following are a dozen questions answered by the engineering staff as part of the NFSA's EOD member assistance program being brought forward as the "Best of August 2014." If you have a question for the NFSA Expert of the Day (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 a formal interpretation in accordance with the NFPA Regulations Governing Committee Projects and should therefore not be considered, nor relied upon, as the official position of the NFPA or its Committees. Unless otherwise noted the most recent published edition of the standard referenced was used.

Question 1 – Large skylights

There is a space that is protected with standard spray sprinklers. A skylight has been installed. It is greater than the 32 sq.ft. area that would allow the sprinkler within the skylight to be omitted per Section 8.5.7 in NFPA 13. Can the rules for omitting sprinklers in ceiling pockets in Section 8.6.7.2 be applied?

Answer: Yes. The sprinkler(s) would be permitted to be omitted from the skylight that is over 32 sq.ft., if it meets the requirements for a ceiling pocket to be unsprinklered. Section 8.6.7.2 describes the volume and depth requirements have been met, along with the protection of the floor area below the sprinkler. Items (5) and (6) of that section will need to be reviewed. Item (5) notes that the finishes need to be noncombustible or limited-combustible. In general, this will mean if the dome of the skylight is a plastic material, sprinklers will need to be installed in the pocket space. Item (6) notes that the sprinklers need to be quick-response within the compartment. Assuming they are quick-response and the materials are non- or limited-combustible, then it would be acceptable to omit sprinklers from this skylight.

Question 2 – Spare Sprinklers

A building is protected using 800 sprinklers. Multiple styles and temperature ratings have been utilized throughout the facility. In regards to the spare sprinklers discussed in Section 6.2.9.5 of NFPA 13, a minimum of 12 sprinklers are required in the stock. How many sprinklers of each type are required to be provided?

Answer: The required number of spare sprinklers must be at least 12

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sprinklers. This total should represent at least one of every type and temperature rating sprinkler used on that project. NFPA 13 does not specify the proportion of spares of each type beyond that minimum requirement. It would be reasonable to fill out the minimum 12 in proportion with the number of each type used on that project. In addition, the annex note on this subject in NFPA 25 suggests a minimum of 2 of each type as a good practice.

Question 3 – Fire Department Connection on a Manual Dry Standpipe System

In a manual dry standpipe system, is the fire department connection required to have a check valve?

Answer: Yes, Section 6.4.2 in the 2013 Edition of NFPA 14 states that a listed check valve shall be installed in each fire department connection, including the connection in manual-dry systems. This section is new to the 2013 Edition, but this should be thought of as a clarification of the standard and not as a new requirement. Many people have tried to leave the check valve out of these manual-dry system connections, but this is a mistake that makes it difficult for firefighters to disconnect hose after using the system.

Question 4 – Exposed Framing in a Concealed Space

A concealed space is predominantly noncombustible. The area is between a sheetrock ceiling attached directly to the combustible structural members above and a noncombustible lay-in tile ceiling below. There are some architectural features in this space, exposed wood framing for soffits below. Can sprinklers be omitted from the concealed space, under NFPA 13, since the exposed wood is for a nonstructural feature?

Answer: No, sprinklers cannot be omitted from the concealed space. The presence of an exposed wood frame supporting the soffit below prevents Section 8.15.1.2.1 from being applied. The annex comment uses the term "nonstructural wood" but the standard uses the more general term "combustible construction". The combustible soffit framing is part of the ceiling/soffit construction. It is not an element of "minimal combustible loading" within the space. However, if the wood supporting the soffit is sheathed with a noncombustible or limited combustible material this section could be applied.

Question 5 – ESFR Sprinkler Operating Pressure

Can the operating pressure of ESFR sprinklers be interpolated in regards to the ceiling height? For example, in one instance a 35-foot ceiling height requires a K 25.2 ESFR sprinkler to operate with 20psi. For the same commodity and K-factor, the ESFR sprinkler at a 40-foot ceiling height needs 25psi. If interpolation is permitted, then a ceiling height of 36.5 feet would have ESFR sprinkler use 21.5 psi (p= 20 + ((36.5-35)/(40-35))(25-20))as the operating pressure.

A**nswer:** No, interpolation is not permitted. ESFR sprinklers have specific pressures for specific ceiling heights and are listed accordingly. Section 12.1.3.2 states that ESFR sprinklers shall be used in buildings with a height that is equal or less than the listing of the sprinkler. A building that is 36.5 feet tall (from the example given above) would need to use the listing for 40 feet, or a drop ceiling may be installed at 35 feet in order to use the lower pressure.

Question 6 – Quick Response Sprinklers in Ordinary Hazard Spaces

Can quick response sprinklers be used in ordinary hazard occupancies?

Answer: The answer is "yes." The ordinary hazard occupancy is permitted to be protected by quick response sprinklers unless the listing specifically prohibits this use or where there are substantial amounts of flammable liquids or flammable dusts. This can be found in NFPA 13 Section 11.2.3.2.2.2, which also indicates quick response sprinklers cannot be used in extra hazard occupancies.

Question 7 – Residential Sprinkler Use

Under NFPA 13, the second through sixth floors of a building are residential occupancy. Can the corridors, in addition to the dwelling units the corridors connect, on those floors use residential sprinklers?

Answer: Yes, Section 8.4.5.1 in NFPA 13 states that corridors, which adjoin dwelling units, can be protected with residential sprinklers. The caveat is that this has to be in accordance with the residential sprinkler listing.

Question 8 – Water Hammer

Is there a time limit for shutting control valves that connect the domestic water from a common feed with a NFPA 13R system?

Answer: Yes, Section 5.2.14.1.2 of NFPA 13R, 2013 Edition requires valves to close in not less than 5 seconds. While the control valve for the domestic water is not directly supplying water to the sprinklers, a quick closing valve could impact the water in the fire protection supply. The required slow-close valve prevents damage from water hammer from other systems connected to the same (common) water supply as the sprinkler. Section 6.8.5 does permit valves that are 2 inches or less on backflow preventers to be exempt from this slow-closing requirement.

Question 9 – Testing the Fire Department Connection

Following the testing required by NFPA 25, is some leakage permitted when hydrostatically testing the fire department connection (FDC) piping?

Answer: No, NFPA 25 refers to NFPA 13 for the requirements of hydrostatic testing. The FDC and its piping are hydrostatically tested according to NFPA 13 as aboveground piping. These requirements do not permit any leakage.

Question 10 – Air Release Valves

Is an air release valve required at the top of each standpipe in a dry manual standpipe system?

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Answer: No, NFPA 14 does not require air release valves in standpipe systems. A dry manual standpipe is empty. When there is a fire, the fire department will fill the system with water and use the water to control the fire. Any air in the piping will be bled out through the hose operated by the firefighter. In other standpipe systems, the trapped air contributes to corrosion, but the typical scale in a standpipe is not a great concern. In general, a piece of scale is not going to plug a 1 ½-inch or 2 ½-inch hose nozzle as it would in the smaller orifices of sprinklers. In combined sprinkler-standpipe systems, the air release valve is triggered by NFPA 13.

Question 11 – Room Design Method and Density/Area Method

When hydraulically calculating a fire sprinkler system, can the Room Design Method be used in adjacent areas of the same building where the Density/Area Method is being used?

Answer: Yes, NFPA 13 permits, at the discretion of the designer, the use of the Room Design Method in any space, including those spaces adjacent to areas calculated with the Density/Area method. In fact, it is very popular to use the Room Design Method in a small room adjacent to areas calculated with the Density/Area Method. An example would be a small ordinary hazard store room calculated with the Room Design Method adjacent to a larger light hazard space calculated with the Density/Area Method. This scenario is very common and is certainly permitted by NFPA 13.

Questions 12 – Hangers on Small Lengths of Pipe

It may be necessary to use short lengths of pipe to avoid an obstruction in a building such as a beam. Do each of these small lengths of pipe on cross mains or feed mains have to have their own hangers?

Answer: No, the intent of the NFPA 13 is for hangers on cross mains and feed mains to follow the spacing rules of Table 9.2.2.1(a) regardless of how many different pieces of pipe are between those hangers and the direction of the pipe. The distance is measured linearly by following the path of the piping.

The language has improved in the 2013 Edition where a new Section 9.2.4.7 was added to clarify this specific point. The new sections says, “A single section of pipe shall not require a hanger when the cumulative distance between hangers on the main does not exceed the spacing required by Table 9.2.2.1(a) and Table 9.2.2.1(b).”

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 5, 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.