NFSA The Voice of the Fire Sprinkler Industry TechNotes

April 14, 2015 **Issue #316**

Best of March 2015

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 March 2015." 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 – Small Closets in Garages

There is a residential home being protected under NFPA 13D. There are two small rooms with access only from the garage. One is a wine storage room that is 80 sq.ft. The other is a 55 sq.ft. closet that houses telephone and internet equipment. Are sprinklers required in these two small spaces?

Answer: No, sprinklers are not required in these garage rooms or closets. NFPA 13D is a document written for life safety. Statistics show that relatively few deadly fires start in these unoccupied areas. Also, the committee has determined that sprinklers are not required in garages due to the fact that they are usually unheated and if sprinklers were to be required, there would be an added cost for freeze protection. As noted in Section 8.3.8, sprinklers are permitted to be omitted in garages along with closets within the unsprinklered garage.

Question 2 – FDC Serving Multiple Systems

A project has multiple ESFR sprinkler systems installed in a warehouse. They will be supplied from a private fire loop which is supplied by a fire pump. It is desired to provide a single fire department connection (FDC) to the private fire loop that would serve all the sprinkler systems. Is this permissible under NFPA 13 for a single FDC to supply multiple sprinkler systems?

Answer: Yes, this is permitted as per Section 8.17.2.4.3. It states, "For multiple systems, the fire department connection shall be connected between the supply control valves and the system control valves." NFPA 13 requires that each sprinkler system must be provided with an FDC but it does not require that an FDC must serve only one sprinkler system. A single FDC may serve all the sprinkler systems supplied by a private water main loop. In this case, the FDC would need

to be installed downstream of the fire pump discharge and upstream of the sprinkler system control valves. This arrangement would allow the fire department to supplement any of the individual sprinkler systems from the same location and FDC.

Question 3 – Small Closets in Apartments
NFPA 13 has a Chapter that extracts sprinkler system requirements from other standards. In the 2007 Edition, Section 21.20.19.2.1, extracted from NFPA 101, *Life Safety Code* , referenced sprinklers in closets greater than 12 sq.ft. inside a dwelling unit. In the 2010 Edition, this language was moved into Annex D, specifically Section D.1.1.6.1. In the 2013 Edition, this language remains in Annex D. Are sprinklers required in dwelling unit closets of apartment buildings under NFPA 13?

Answer: Yes, NFPA 13 requires sprinklers in *all* apartment dwelling unit closets regardless of their size. NFPA 101 has the allowance for a small closet, identified as 12 sq.ft. or less, to omit the fire sprinkler within it. The information provided in the extracted text had caused some confusion. Therefore, the committee moved it to Annex D so that it was purely informative. This means it only applies in jurisdictions where NFPA 101, has been adopted. It is not otherwise enforceable under NFPA 13 alone.

Question 4 – FDC on an NFPA 13D System
A client has requested a fire department connection (FDC) on their NFPA 13D system. FDCs are not required by the standard. Can the requirements for FDCs from NFPA 13R be a reasonable guideline for adding the FDC?

Answer: Yes, the requirements of NFPA 13R, Section 6.11 Fire Department Connection, provide reasonable guidance but NFPA 13D does impose additional restrictions when an FDC is installed. If an FDC is installed in a NFPA 13D system, it must be designed to accommodate 200 psi during a hydrostatic acceptance test. This may restrict some of the design options otherwise available for the system. It should also be noted that the presence of the FDC could trigger different requirements for backflow prevention.

NFPA 13D does not require a FDC because it is intended as a life safety system to provide time for occupant egress. It is not typically anticipated that a fire department would supply this system in the event of a fire emergency. As it will be necessary to contact the fire department to establish their input on hose threads and the FDC location, it might be worth a discussion about their standard procedures for operations at a residence provided with a NFPA 13D system and a FDC.

Question 5 – Unit Heater in a Concealed Space
There is a project where the building is noncombustible construction. There will be gas fired unit heaters installed in a noncombustible concealed space. The building will be protected following NFPA 13. The concealed space meets the requirements such that sprinklers would normally be allowed to be omitted from this space. Does the inclusion of the unit heaters require sprinklers to be installed in the noncombustible concealed space?

Answer:
No. As Section 8.15.1.2.2 of NFPA 13 (2013) states:

8.15.1.2.2 Concealed spaces of noncombustible and limited-combustible construction with limited access and not permitting occupancy or storage of combustibles shall not require sprinkler protection.

The definition of a noncombustible, in regards to noncombustible concealed space, is dependent on the type of construction. The inclusion of gas fired unit heaters have generally not been considered as storage of combustibles. Therefore, as long as this area will not store any combustibles and since it is still a noncombustible concealed space, it shall not require sprinklers per Section 8.15.1.2.2.

Question 6 – Testing Pressure Restricting Devices
Devices are sometimes needed in order to reduce the pressure in a standpipe system. Are "pressure restricting devices" tested like other pressure reducing valves when following NFPA 25?

Answer: Yes. Pressure restricting devices, such as on standpipe hose valves, need to be flow tested on the same frequency as other pressure reducing valves and pressure control valves. The requirement can be found in NFPA 25 in the Standpipe and Hose Systems Chapter. The terminology that NFPA 25 uses in that section is the overall term for all pressure restricting and control devices. Therefore, the testing requirement applies to all devices, even those that just restrict the pressure.

Question 7 – Partitions in Ordinary Hazard
Partitions that do not go all the way to the ceiling in ordinary hazard occupancy spaces are being planned for a building. Are all partitions in ordinary hazard treated as a full height wall? Is there a distance that can be maintained below the sprinkler deflector in order to ignore the partitions when spacing standard spray sprinklers?

Answer: Partitions are not considered full height walls and if these partitions end at least 18 inches below the deflector (for standard spray sprinklers) they can be ignored when it comes to spacing sprinklers.

As noted, Section 8.6.5.2.2 and its corresponding table and figure apply only to light hazard occupancies. When protecting an ordinary or extra hazard situation, where partitions do not go all the way to the ceiling, the minimum clearance for the sprinkler being used at the ceiling would have to be provided in order to space sprinklers independent of the partition locations. For standard spray sprinklers, the minimum clearance is 18 inches. So, if the partitions stop at an elevation where there is at least 18 inches from the top of the partition to the sprinkler deflector, then the location of the partitions can be ignored when spacing the sprinklers at the ceiling. If the top of the partition encroaches into the 18-inch clearance space, then the partitions are considered as walls when spacing the sprinklers, but they still need to maintain the minimum 6 feet between sprinklers because there will be no solid object protecting a sprinkler from the direct spray of water when a nearby sprinkler operates.

Question 8 – Galvanized Pipe for Dry and Preaction Systems
NFPA 13 Section 8.4.7.2.1 limits steel piping in preaction and dry pipe systems to galvanized steel. Is it the intent of NFPA 13 to limit *all* dry pipe systems where steel pipe is used to galvanized pipe?
Answer: No, Section 8.4.7 and its subparagraphs apply *only* to CMSA sprinklers. Galvanized pipe is required for dry pipe CMSA systems except as permitted in certain freezers under the conditions specified in 8.4.7.2.2 where black steel is permissible. Galvanized pipe is not required for systems using other sprinkler types.

Question 9 – Sprinklers in Revolving Doors
Are there provisions in NFPA 13 that would permit a sprinkler to be omitted inside a revolving door enclosure?

Answer: Yes, it is implicit in that there is no practical way to install a sprinkler inside a revolving door enclosure which may also be regarded as a piece of mechanical equipment. A reasonable argument can be made citing Section 8.1.1*(8) and regarding the revolving door assembly as mechanical equipment. Although it will arguably be "occupied", the occupancy is by nature transient and also prevents the significant accumulation of combustibles inside the enclosure. Ceiling sprinklers should be arranged to protect the floor space as if the "equipment" were not present.

The 2016 Edition of NFPA 13 is expected to contain new language explicitly permitting this in a new Section 8.15.25, see below. Once that edition is published, it may be acceptable to an AHJ to cite it under the equivalency clause in older editions of the standard.

> ***NFPA 13 (2016, Second Draft)***
> 8.15.25 Revolving Door Enclosures.
> Sprinkler Protection shall not be required within revolving door enclosures.

Question 10 – Alternate Power Requirements for Electric Fire Pumps
Apart from the requirements in NFPA 20 and with the exception of high-rise and underground buildings, are there any requirements to provide alternate power to fire pumps?

Answer: No, the International Building Code (IBC) defers to NFPA 20 with the exception of Section 403 for *High-Rise Buildings* and Section 405 for *Underground Buildings*. NFPA 20 only requires an alternate power source for electric fire pumps if the height of the structure is beyond the fire department's pumping capabilities as per Section 9.3.1 or if the normal power source is not deemed reliable as per Section 9.3.2*.

Question 11 – Antifreeze Use in Jurisdictions Adopting 2007 or Earlier NFPA 13
Our jurisdiction still references the 2007 edition of NFPA 13 which still permits the use of unlisted antifreeze solutions in new sprinkler systems. Are there any special limitations for antifreeze systems where older editions of NFPA 13 permit their use?

Answer: Yes, based on the latest edition of the NFPA 13 standard, unlisted antifreeze solutions should not be used in new systems. The changes in the antifreeze requirements are reflected in the latest 2013 Edition of NFPA 13 and have been made retroactive to the 2010 Edition by

means of a *Temporary Interim Amendment*. Although no official amendment has been made by NFPA to the 2007 or prior editions, it would be prudent not to ignore the information that is available. The hazard with antifreeze does not change depending on which edition of the standard is used for installation purposes. Failure to acknowledge these limitations could create a potential liability as the information is readily available in the newer editions. It is rare for NFPA to process a TIA on documents other than the most current published edition. Although this issue is a large concern, the NFPA chose to only process the TIA on the 2010 Edition, recognizing that the newest published edition represents the current positions based on information presented to the Committee.

Some additional information about antifreeze testing may be found in Annex F of NFPA 13:

F.1.2.12 FPRF Publications. Fire Protection Research Foundation, 1 Batterymarch Park, Quincy, MA 02169.

Antifreeze Solutions Supplied through Spray Sprinklers – Interim Report, Fire Protection Research Foundation, February 2012

Antifreeze Systems in Home Fire Sprinkler Systems — Literature Review and Research Plan, Fire Protection Research Foundation, June 2010

Antifreeze Systems in Home Fire Sprinkler Systems – Phase II Final Report, Fire Protection Research Foundation, December 2010

Question 12 – Sprinklers Location Relative to Top of Skylight

There have been situations observed where sidewall sprinklers have been used in skylights at locations several feet below the skylight ceiling level. Is this permissible under NFPA 13?

Answer: No, there is no prescriptive provision in NFPA 13 that alters the distance a sprinkler can be located below a ceiling for skylights. The only alternative provided to install sprinklers at a greater distance below a ceiling is provided in 8.1.1*(6) based on tests or modeling calculations. If calculations or testing demonstrates comparable performance of the sprinklers then a greater distance from the ceiling (or ceiling of the skylight) could be acceptable.