NATIONAL FIRE SPRINKLER ASSOCIATION, INC.

Tuesday e-Tech Alert
April 8, 2008
Number 112
Russell P. Fleming, P.E. - Editor

Best Questions of March 2008

We have selected the following questions as the "Best of March 2008" answered by the engineering staff as part of the NFSA's EOD member assistance program:

Question 1 – FM Data Sheets Availability

We have heard that there has been a change in the policy of FM Global regarding distribution of their data sheets. Can you provide information?

Answer: Yes, FM Global has announced that, effective April 1, 2008, Data sheet 2-8N based on NFPA 13 is currently being revised and will be available at a later date as data sheet 2-0. Go to www.fmglobal.com/datasheets to register for the ability to download the data sheets. The "sprinklers" subset includes the following documents:

Data Sheet	Title	Last Update (mm/yy)
2-1	**Prevention and Control of Internal Corrosion in Automatic Sprinkler Systems**	**5/01**
2-2	**Installation Rules for Suppression Mode Automatic Sprinklers**	**9/02**
2-7	**Installation Rules for Sprinkler Systems Using Control Mode Specific Applications (CMSA) Ceiling Sprinklers for Storage Application**	**1/05**
2-8	**Earthquake Protection for Water-Based Fire Protection Systems**	**9/04**
2-8N	**Data Sheet 2-8N is currently being revised and is not available. It will be listed at a later date as Data Sheet 2-0**	**N/A**

The "storage" subset includes the following choices:

Data Sheet	Title	Last Update (mm/yy)
8-1	**Commodity Classification**	**5/04**
8-3	**Rubber Tire Storage**	**9/04**

8-7	**Baled Fiber Storage**	**1/00**
8-9	**Storage of Class 1, 2, 3, 4 and Plastic Commodities**	**1/08**
8-10	**Coal and Charcoal Storage**	**1/03**
8-18	**Storage of Hanging Garments**	**1/00**
8-21	**Roll Paper Storages**	**1/08**
8-22	**Storage of Baled Waste Paper**	**1/02**
8-23	**Rolled Nonwoven Fabric Storage**	**5/03**
8-24	**Idle Pallet Storage**	**9/00**
8-27	**Storage of Wood Chips**	**5/00**
8-28	**Pulpwood and Outdoor Log Storage**	**5/00**
8-29	**Refrigerated Storage**	**5/07**
8-30	**Storage of Carpets**	**1/03**
8-33	**Carousel Storage and Retrieval Systems**	**9/04**
8-34	**Protection for Automatic Storage and Retrieval Systems**	**1/03**

Question 2 – Accessible Under-Floor Space with Plastic Piping

A floor/ceiling space containing plastic piping that is part of a building's plumbing system can be accessed through a floor panel. If the space is otherwise noncombustible, can this be considered a concealed space that does not require sprinklers?

Answer: Yes, the space appears to be a concealed space that would not require sprinkler protection per section 8.15.1.2.2 of NFPA 13. The construction materials are non-combustible or limited combustible. There does not appear to be storage in the space. The fact that it is accessible through a hatch is not a problem. Since the access is a hatch and not a door, it indicates that access is not going to be a regular occurrence and points toward this being more of a concealed space than anything else.

The plastic pipe is not an issue. The committee has always considered small amounts of combustibles to be permitted to be present while leaving sprinklers out of this type of space. The issue is whether or not the combustibles would promulgate fire in all directions or not. For the 2007 edition of NFPA 13, the committee clarified its position in an annex note by specifically stating, "Minor quantities of combustible materials such as but not limited to: cabling, nonmetallic plumbing piping, nonstructural wood, etc. can be present in concealed spaces constructed of limited or noncombustible materials but should not typically be viewed as requiring sprinklers."

Even if your local jurisdiction is not yet using the 2007 edition of NFPA 13, this can be viewed by the AHJ as an interpretation on the previous editions since it was balloted by the committee and passed by a vote in excess of what the same committee would need to pass a formal interpretation.

Question 3 – Light Fixtures and Obstruction Rules in Small Closets

We still have a few AHJ's asking us to move sprinklers in small closets due to obstructions created by light fixtures. We recall receiving prior advice that this is not necessary. Also, is it required to check the wattage of closet lights to maintain minimum separation distances?

Answer: Since 1999, the NFPA sprinkler committees have continued to relax the rules associated with sprinklers in closets. There is no intent to require that sprinklers in closets follow any obstruction rules. Although closets are not addressed specifically, the NFPA 13 rules allow spray sprinklers to ignore light fixtures in light and ordinary hazard occupancies, so the sprinkler is permitted to be placed anywhere in the closet without respect to the position of the fixture (see 8.6.5.2.1.4). The committee was actually asked to address the situation and considered it too obvious to warrant a direct statement.

In the 2007 editions of NFPA 13R and NFPA 13D, the committee (a different committee than the one responsible for NFPA 13) directly addressed the issue of closets and residential sprinklers. Section 8.2.5.1 was added to NFPA 13D and section 6.8.1.5.3.1 was added to NFPA 13R. Both of these sections read the same. Sprinklers are permitted to be placed in closets (even those housing mechanical equipment) without respect to any obstruction rules as long as the closet is less than 400 cubic feet and the sprinkler is placed at the highest elevation in the closet.

The two different committees take a different approach, but have a similar intent. If a fire starts in a closet, the heat from the fire will set a sprinkler off regardless of small obstructions like light fixtures. Once that sprinkler opens, the closet will be flooded with water. Even if the sprinkler can't get the water directly on a fire, the water droplets will be entrained in the air to the fire and will control the heat being released from the fire.

Question 4 – Listing of Thread Sealants

Are thread sealants required to be listed or do they fall more under the category of components that don't affect the system performance (Section 6.1.1.5 in the 2007 edition of NFPA 13)?

Answer: This is an extremely complex subject that goes deeper than just trying to answer the question about whether the thread sealant "affects system performance". First, section 6.1.1.3 allows certain types of pipes and fittings to be installed without being listed. As such, any compound or tape used to seal those joints could also be unlisted. It would make no sense to require an unlisted pipe and an unlisted fitting to be joined with listed thread sealant. Second, sections 6.3.6 and 6.4.3 allow other types of pipe and fittings to be used in sprinkler systems when they are specially listed. It is possible that a condition of a special listing involves the use of a specific listed thread sealant. Since all of the rules of a special listing must be met when using a special product, then the sealant must be listed if the special listing of the pipe and/or fitting requires it to be. Third, there is the potential for some situation that does not fall into either of these two categories. In such cases, while it is true that poorly made thread sealants might allow leakage, the same could be said of items such as drain valves that are not required to be listed.

One obvious advantage of using a listed thread sealant involves the issue of compatibility of different products. By listing a sealant, the listing laboratory takes on the responsibility of making sure that the product is compatible with general industry practices.

Question 5 – Definition of Flexible Elbow

Figure A.9.3.2(b) of NFPA 13 (2007 edition) calls out the use of a “flexible elbow”. The term is used nowhere else. Should it say “elbow assembled using flexible couplings” or something similar?

Answer: Yes. The "flexible elbow" is simply an elbow attached with flexible couplings. The elbow itself is not flexible.

Question 6 – QR Sprinkler Area Reduction in Parking Garages

We are dealing with an underground parking garage, four tiers/floors high. If quick response sprinklers are installed can the design area be reduced? The floor and ceiling of the garage are sloped, but are parallel, but are also open to adjacent floors with ramps going up or down. Plus, at the ends of the ramps the floor/ceilings are flat. My gut reaction is no, because I assume the area reduction is based on typical building floors/ceilings, but the parallel slopes are interesting when applied this way. What do you think?

Answer: This issue does not usually come up because most parking garages have dry-pipe systems and you are not allowed to reduce the design area for a dry-pipe system.
Assuming that the system is a wet pipe system, there would still need to be evidence that each floor is its own compartment. There is a potential problem that the hot gasses from the fire would go up the ramp and not collect at the sprinklers, removing the advantage of the QR sprinklers. Effectively, the ceiling height is greater than 20 ft to its “peak”. So, the answer would depend on how well the ramps were separated from the rest of the parking areas. If there was some type of draft stop, then the case might be made that the garage floors are separate compartments and the reduction would be applicable.

Question 7 – NFPA 13R Systems in Group I Occupancies

In our state (Indiana), they are going to start classifying assisted living facilities as an “I” institutional occupancy just like nursing homes, as opposed to a residential occupancy. Does this affect whether or not we can protect them with a NFPA 13R system?

Answer: The International Building Code (IBC) classifies assisted living facilities as I-1 occupancies. According to section 903.2.5 of that Code, you are allowed to protect I-1 occupancies with NFPA 13R sprinkler systems. However, you need to be careful. In order to qualify for Medicare and Medicaid reimbursement, these facilities also need to comply with the NFPA Life Safety Code, which allows a “beefed-up” NFPA 13R sprinkler system, but only for certain buildings. Section 32.2.3.5.3.1 of the Life Safety Code limits the use of NFPA 13R to “small facilities” (those that only have a maximum of 16 residents) and then requires the system to have sprinklers in all habitable areas and closets. So, this is more stringent than the IBC. Since many if not most assisted living facilities rely on Medicare and Medicaid payments, they may well need to meet the more stringent rules of the Life Safety Code.

Question 8 – Break Tanks for NFPA 13D and 13R Systems

Can I use a tank that contains less than the required 10 minutes of capacity for 13D system, or less than the 30-minute capacity for 13R, if there is a supply line coming into the tank that will make up the difference? As an example, although I need 260 gallons to supply the two sprinklers in a 13D system for 10 minutes, I only have room for a 200 gallon tank. The domestic line will refill the tank at a rate of 10 GPM. If we do a flow test for 10 minutes to prove that it will work, are we meeting code?

Answer: The short answer to your question is yes, you can count on refill from a supply to make up some of the duration. This type of tank is called a "break tank". NFPA 13D places no limitations on the design of the break tank or the reliability of the refill source.
The AHJ would have to agree on the reliability of the refill source. In your example, you mention a refill rate of 10 gpm. You would need to prove to the AHJ that this is reasonable given the conditions that exist.

For NFPA 13R, the break tank rules are more consistent. NFPA 13R states that pumps need to be installed in accordance with NFPA 20. The 2007 edition of NFPA 20 has an entire section devoted to the installation of break tanks and their refill mechanisms.

Question 9 – Residential Sprinklers Under Exposed Wood/Composite Wood Joists

A four-story mixed use (office and residential) building is being sprinklered in accordance with NFPA 13, using residential sprinklers for the dwelling units and their corridors. The floor in question is comprised of residential condo units, and was originally designed to have gypsum wallboard installed below 16-inch deep composite wood joists. Now the architect wants to know the potential consequences of not installing the gypsum wallboard but leaving the composite wood joists exposed. We have looked at the listing for the sprinklers initially proposed and can't find this exact scenario described.
Can we use the residential sprinklers for this application? If not, what are our options?

Answer: You cannot use residential sprinklers under exposed wood joists or composite wood joists. The only exception is for the protection of basement areas in NFPA 13D systems, which “assumes” the later installation of ceiling sheathing. The only option that we can suggest would be to switch to quick response spray sprinklers installed in accordance with Section 8.6 of NFPA 13. The sprinklers are permitted by Table 8.6.2.2.1(a) to be spaced at 130 sq ft per sprinkler (combustible obstructed construction less than 3 ft on center) with a maximum of 15 ft between sprinklers. You need to put the sprinklers 1 to 6 inches below the plane of the bottom of the composite wood joists, which will keep them within 22 inches of the deck above, to meet the minimum requirements of Section 8.6.4.1.2. The design area would start at 0.1 gpm/sq ft over 1500 sq ft, but could be reduced due to the use of the QR sprinklers.

Question 10 – Hanger Requirements for Short Pieces of Pipe

We have a project where clean room modules are shipped in from Sweden and put in place here. The modules will be reconnected with grooved spool pieces of pipe 1 to 6 inches in diameter and from 1.5 to 3 ft in length. Are hangers needed for these short spool pieces or can

they be supported from hangers on the adjacent pipes? The hangers on the adjacent pipes will be within 12 ft of each other.

Answer: Extra hangers for the spool pieces of pipe should not be required so long as the distance between the hangers complies with Table 9.2.2.1(a) or (b). While NFPA 13 does require that every piece of pipe have its own hanger, there are exceptions that are similar to this situation, or that create a condition that is worse than this situation, so you should be able to convince the AHJ of equivalency in accordance with Section 1.5 and 1.6 of NFPA 13 addressing alternate arrangements. For example, short pieces of pipe up to 6 ft long are permitted on branch lines without hangers when sprinklers are spaced less than 6 ft on center provided the hangers are no more than 12 ft apart (see Section 9.2.3.2.2). In essence, this puts a hanger on every other short piece of pipe. Your situation is better than this example since it would provide hangers on two of the three pipes and the hangers will be closer than 12 ft.

Question 11- Minimum Spacing of ESFR Sprinklers

Can ESFR sprinklers ever be spaced closer than 8 ft apart without having a wall separating them? For example with 24 inch deep beams spaced 6 ft apart and framed into girders, can ESFR sprinklers be spaced in every pocket at 6 ft apart? Can ESFR sprinklers be spaced closer than 8 ft apart in open bar joist construction if a baffle is placed between the ESFR sprinklers?

Answer: No, the distance between ESFR sprinklers is NEVER allowed to be less than 8 ft. The use of baffles is not recognized by NFPA 13 and does not address the concern regarding the number of sprinklers that might open. Section 8.4.6.3 of NFPA 13 makes it clear that even with solid obstructed types of construction, the minimum spacing rule of 8 ft between sprinklers still applies.

Question 12 – Fire Department as the AHJ for the FDC

We note a change in Section 8.17.2.4.6 of the 2007 edition of NFPA 13 dealing with the location of the fire department connection. Section 8.17.2.4.6 now states, “The location shall be based on the requirements of the fire department” whereas it used to refer to the Authority Having Jurisdiction (AHJ). Can you confirm that the committee was only trying to be clearer in this section revision and that they believed a state AHJ already has the authority to require the local fire department be consulted for FDC location in the 2002 edition of NFPA 13?

Answer: The 2002 edition of NFPA 13 (as well as all other editions) makes it very clear that there can be more than one AHJ. The definition of the AHJ in Section 3.2.2 clearly states that it is the entity responsible for approving any portion of the standard. Since the standard covers a number of subjects, there is no intention to limit the approvals to one individual or entity. The annex text (A.3.2.2) goes on to clarify this subject further, indicating that the definition of an AHJ is intentionally “broad” and could be a fire chief, fire marshal, insurance agent or building owner. For the 2007 edition of NFPA 13 the committee accepted a proposal for language regarding the need for the fire department to be consulted on the placement of the FDC. The 2007 edition of the standard reflects the NFPA’s official position on what the correct rules should be. There is no reason to expect any difference between the language of the 2007 edition and the language of a Formal Interpretation on this subject if the committee were balloted on a prior edition.

Upcoming NFSA "Business Thursday" Seminar – April 17th

Topic: ICC Code Development Process/FS-FP Proposals
Instructors: Bruce Johnson and Dorothy Harris
Date: April 17, 2008

This presentation is a review of the International Code Council's code development and review process. How code change proposals can be proposed; the make-up and purpose of the Code Review Committees, Initial and Final Action Hearings, public comment and testimony, Final vote by Governmental Members, publication of Supplement and Final Code Books. The presentation will also review selected fire protection related code change proposals currently under review for Final Action in Minneapolis, Minnesota, September 2008.

Upcoming NFSA "Technical Tuesday" Seminar – April 22nd

Topic: Water Supply Systems
Instructor: Cecil Bilbo, Jr., NFSA Director of Technical Services
Date: April 22, 2008

When a sprinkler system is called on to help control a fire in a building, the adequacy of the water supply can determine if property and lives will be saved. Understanding the different types of water supplies that can be used in the NFPA Standards will ensure the system works properly. Whether it is a city water supply, fire pump, tank, or a pond, you will need to know the rules that affect the installation, testing, use and inspection of the different types of water supply systems. This seminar will cover a broad review of the rules for each of the types of water supplies allowed for use in fire protection systems. It will also cover some of the federal regulations that have made it into each state and county in the United States.

Information and registration for the above "Technical Tuesday" and "Business Thursday" seminars are available at www.nfsa.org or by calling Dawn Fitzmaurice at 845-878-4200 ext. 133.

Additional NFSA training opportunities include…

NFSA Two-Week Technician Training Classes

August 4-15, 2008	Providence, RI
October 13-24, 2008	Chicago, IL
November 10-21, 2008	Houston, TX

For more information, contact Nicole Sprague using Sprague@nfsa.org or by calling 845-878-4200 ext. 149.

In-Class Training Seminars

The NFSA training department also offers in-class training on a variety of subjects at locations across the country. Here are some seminars scheduled for 2008:

Apr 22	Richmond, CA	Pumps for Fire Protection
Apr 23	Richmond, CA	Fire Pump Layout & Sizing (a.m.)
Apr 23	Richmond, CA	Commissioning & Acceptance Testing (p.m.)
Apr 24	Richmond, CA	Inspection, Testing & Maintenance (CA Edition)
Apr 29	McFarland, WI	Plan Review Policies & Procedures
Apr 30	McFarland, WI	Pumps for Fire Protection
May 1	McFarland, WI	Commissioning & Acceptance Testing (a.m.)
May 1	McFarland, WI	Fire Pump Layout & Sizing (p.m.)
May 6-7	Colorado Springs, CO	NFPA 13 Overview & Intro to Plan Review
May 7	Mundelein, IL	Introduction to Sprinklers (a.m.)
May 7	Mundelein, IL	NFPA 13 Update 2002 (p.m.)
May 8-9	Mundelein, IL	NFPA 13 Overview & Intro to Plan Review
May 8	Colorado Springs, CO	Sprinklers for Dwellings
May 13	Quincy, MA	Sprinklers for Dwellings
May 14	Quincy, MA	Basic Seismic (a.m.)
May 14	Quincy, MA	Standpipe Systems (p.m.)
May 15	Quincy, MA	Pumps for Fire Protection
May 20	Willoughby, OH	Plan Review Policies & Procedures
May 21	Willoughby, OH	Inspection, Testing & Maintenance
May 22	Willoughby, OH	Underground Piping (a.m.)
May 22	Willoughby, OH	Commissioning & Acceptance Testing (p.m.)

For more information on these seminars, or to register, please visit www.nfsa.org or call Dawn Fitzmaurice at 845-878-4207 or email seminars@nfsa.org.

About the National Fire Sprinkler Association

Established in 1905, the National Fire Sprinkler Association (NFSA) is the voice of the fire sprinkler industry. NFSA leads the drive to get life-saving and property protecting fire sprinklers into all buildings; provides support and resources for its members – fire sprinkler contractors, manufacturers and suppliers; and educates authorities having jurisdiction on fire protection issues. Headquartered in Patterson, N.Y., NFSA has regional operations offices throughout the country. www.nfsa.org.