



Tuesday e-Tech Alert
December 4, 2007
Number 102

Best Questions of November 2007

We have selected the following questions as the “best of November 2007” answered by the engineering staff as part of the NFSA’s EOD member assistance program:

Question 1 – Valves and Sprinklers in Paint Spray Rooms

If I have a control valve isolating a 2,000 sq ft spray room do the spray booths also need their own isolation valves? The spray room has a density of 0.40 gpm per sq ft over 2,000 sq ft. I also would like to know if the sprinklers inside each paint booth, providing densities of 0.40 gpm/sq ft with protection areas of 90 sq ft, need to be minimum 11.2 K-factor due to the high density.

Answer: NFPA 13 is misleading on this subject due to an error in the preparation of the 2007 edition. The applicable standard is NFPA 33, and the relevant requirement is extracted from NFPA 33 to also appear as Section 21.4.1.5 of the 2007 edition of NFPA 13:

The sprinkler system for each spray area and mixing room shall be controlled by a separate, listed indicating valve(s), operable from the floor.

A review of the editions of standards referenced in NFPA 13 suggests that this wording appears as Section 9.4.5 of the 2007 edition of NFPA 33, but in reality the wording of the section was changed during the development of the 2007 edition of NFPA 33 such that it now reads as follows:

The sprinkler system shall be controlled by a separate listed indicating valve(s), operable from floor level.

The substantiation for the change, which was unanimously approved by the committee, was that “As presently written, the requirement could require too many valves for small systems. The revised wording requires a single valve for each system. Also, the revision defines ‘accessible’.” Given the recent documentation of this change, it is clear the committee did not intend to require a multitude of valves protecting each spray booth within a spray room, and intends that but that a single valve is sufficient.

You have also asked if the sprinklers inside of paint spray booths need to be at least K-11.2 due to the density of 0.4 gpm per sq ft. The answer is no. The requirement for larger orifice sprinklers based on density is found within Section 12.6 of NFPA 13 and is applicable only to storage applications.

Question 2 – Omitting Trapeze Hangers in Extra Wide Bays

Our company has installed a gridded wet pipe sprinkler system within a warehouse with 58-ft bays, 6 lines per bay. System line piping is supported from the building bar joists with a hanger on each starter pipe attached to the bar joist immediately adjacent to either side of the cross main. The hangers on the cross main are located at each building beam with intermediate trapeze hangers, but two trapeze hangers are being omitted in accordance with NFPA 13 (2002 edition) Section 9.2.4.4. While we feel this arrangement is acceptable per NFPA 13 the structural engineer is insisting additional trapeze hangers must be installed between branch lines. Are we correct in stating that our installation is in accordance with the requirements of NFPA 13?

Answer: We agree that the omission of two non-adjacent intermediate hangers for the main in the extra wide bay meets the intent of NFPA 13. NFPA 13 presumes that the structural members will have the capacity to support this load arrangement. If there are special concerns about the ability of this particular structure to support the loads then additional trapeze hangers can be added beyond those required by NFPA 13. However, it is important that the structural engineer correctly understands the intent of NFPA 13. The NFPA 13 specification of a point load of 250 lb. plus the weight of the water-filled pipe at each point of hanging is sometimes misinterpreted as a cumulative loading for the piping system.

Question 3 – Using Rack Protection Criteria for Palletized Storage

It seems to me there is a paragraph in NFPA 13 that indicates that if a commodity can be protected in racks with a particular density that the same criteria can be used for protection of the commodity in palletized storage as well. Is this correct?

Answer: You're probably thinking about Section 15.2.6 in the 2007 edition, which allows the use of the Chapter 17 rack storage protection criteria for plastics in place of the palletized criteria for the same storage height and clearance. That was based on the recognition that the rack criteria was developed based on larger orifice sprinklers, which are now mandated for the higher densities. We're not aware of any parallel section in Chapter 14 that would allow the use of Chapter 16 criteria for Class I thru IV commodities, but this could be allowed by the AHJ on the basis of equivalency. It is widely recognized that rack storage presents a more severe protection challenge due to the availability of combustion air in rack configurations.

Question 4 – Testing of Preaction Systems

NFPA 13 (2007 editions) sections 8.17.4.4.3 and 8.17.4.4.4 state that a test connection is required for a double interlock preaction system over 750 gal. However, the only difference between them is that 8.17.4.4.4 requires this at the remote location on the system. Why? Was one of these sections intended to address a different type of preaction system to justify the difference?

Answer: The intent was to mirror Section 8.17.4.3 on dry-pipe systems. The first section requires the connection and the second section tells you that the connection needs to be on the most remote portion of the system. The NFPA likes it to be this way so that each section contains only a single requirement. We agree that the language is awkward and needs to be evaluated since double-interlock systems that are less than 750 gal in size need to have a test connection as well, and that test connection needs to be at the most remote point since Section 7.3.2.3 eliminated the

750 gal alternative to the time limit. We need to know the water delivery time to the most remote portion of all double-interlock systems, so sections 8.17.4.4.3 and 8.17.4.4.4 both need to apply to all double-interlock systems, not just those over 750 gal in size. NFSA will attempt to convince the NFPA Sprinkler Committee to address this issue in the next edition of NFPA 13.

Question 5 – Protection of PODS (Portable On Demand Storage)

I had a question on the PODS system last week and thought I recalled an NFSA article on the subject but couldn't find anything. My research shows that 47 states have a PODS storage unit in them, and I can't really see the AHJs and contractors all hiring fire protection engineers to develop special protection criteria. How are they being classified for purposes of sprinkler protection?

Answer: The NFSA has not published any articles on the protection of PODS, but the NFPA 13 Committee just discussed this subject at its November 2007 meeting. The committee noted that there are some people that would protect this as a Class IV commodity given that we generally consider the fire starting on the outside of the commodity and the storage units that the PODS company uses are mostly wood and metal with a little plastic (less than 25%). However, the NFPA 13 committee took the position that there are no set criteria. The owner (PODS) needs to hire a professional engineer to examine the situation and come up with specifications. Then, it is up to the owner (PODS) to police their customers and make sure that they do not violate the assumptions about what will be stored in the units.

Question 6 – Hydrostatic Testing of Sprinkler Drops

A question that has come up with a few different local sprinkler contractors is whether hydrostatic testing is to be performed with or without the sprinklers installed. I think that it is a requirement of 13 that the sprinklers be installed but some contractors have argued otherwise. Who is correct?

Answer: This topic is a difficult one. Years ago the NFSA Engineering and Standards (E&S) Committee addressed this situation and established the position that the industry standard was not to perform two hydrostatic tests. The hydrostatic test was usually performed prior to the walls and ceilings being finished so that the pipe was still exposed and any potential problems could be easily identified and repaired. This meant that the sprinklers would not yet be in place because there was a concern that they might be damaged when the ceiling was being installed, so this test was conducted with plugs in the sprinkler outlet. Once the sprinkler system has passed this test, our E&S Committee believed that an additional test with the sprinklers in place was unnecessary because each individual sprinkler undergoes a separate hydrostatic test at the factory before it is shipped to the job site. So, our position for many years was that the hydrostatic test did not need to be performed a second time after the sprinklers were placed in the system.

More recently, we have begun to rethink this question. In an era where building owners are extremely concerned about accidental discharge from sprinklers, the single hydrostatic test with plugs in the sprinkler outlets may not be enough assurance of system integrity. Even though each sprinkler is subjected to an individual hydrostatic test before it leaves the factory, there are issues of damage or other problems that could occur in the transportation or installation of that sprinkler that would affect the potential for leakage or inadvertent operation. Conducting a hydrostatic test

after the sprinklers have been installed is one way to make sure that the sprinklers have been threaded correctly into their outlets and are capable of handling system pressures.

Question 7 – Spacing to Walls vs. Windows

A sprinkler in the center of a small room is 9'0" off a wall. The window along the wall extends an additional 6 inches, leaving the sprinkler 9'6" from the window. Is this spacing acceptable per NFPA (assuming the room is less than 900 sq. ft.)?

Answer: Yes, we space to walls, not windows. This is obvious by reading the section on sprinkler spacing, where the standard specifically says that we measure the maximum allowable distance from the wall, not the window (see 8.5.3.2.1 in the 2002 edition of the standard, similar section in all previous editions). So many AHJs seem to have a problem understanding this simple concept that we had to add a section to the 2007 edition to clarify the situation. See Section 8.5.3.2.4 in the 2007 edition, which specifically states that the distance to the wall is measured to the wall (not the window) as long as the inset of the window does not create any additional floor space.

Question 8 - Sprinklers in Closets with Washers and Dryers

NFPA 13, 2002 Section 8.14.8.2 states sprinklers are not required in clothes closets, linen closets, and pantries within dwelling units....etc. What about closets containing a washer/dryer? Would this fall under this rule as well, as long as it does not exceed 24 sq ft and the least dimension does not exceed 3 ft?

Answer: First, be careful when using this section from NFPA 13. When you read all the way to the end of the sentence, you see that it only applies to hotel and motel rooms. Most hotel and motel rooms do not have washers and dryers in the closets.

Second, if you do have a hotel or motel room with a washer and dryer in the closet, then the closet is no longer a "clothes closet, linen closet or pantry". The closet has become a small laundry room and requires sprinkler protection. Given the high number of dryer fires in residential occupancies, it only makes sense to sprinkle these closets.

Question 9 – Tank Capacities Relative to Vortex Plates

Where a pump takes suction from a tank, what dimension from the bottom of the tank is used to calculate usable water when calculating the amount of water storage in the tank?

Answer: Technically, you can't count any of the water below the anti-vortex plate. Lock in the location of your anti-vortex plate and then make sure that you have a sufficient amount of water above the plate.

Question 10 – Branch Line Restraint for Grids in Earthquake Areas

Would branch line restraint be required on gridded systems when all of the branch lines are located between the mains? There really is no end of the branch line.

Answer: The purpose of the restraint at the end of the branch line is to keep the line from whipping around during an earthquake. Attaching the branch line to the main (as you do in a grid) and bracing that main provides more than adequate restraint of the branch line. You will need to restrain branch lines at intervals as required in Table 9.3.6.4 of the 2007 edition.

Question 11 – Minimum Distance from Lights as Heat Sources

NFPA 13 references distances from lights to sprinklers in residential areas (NFPA 13, 2007 edition, Table 8.3.2.5c), however there isn't a reference to areas other than residential for lights as a heat source. Our current situation involves a church with a 575 watt light that is approximately 12 inches from the back of the light to our sprinkler. Are lights considered a heat source to which a high temperature sprinkler would need to be utilized?

Answer: Section 8.3.2.2 is intended to be a performance-based requirement that applies to all sprinklers. Table 8.3.2.5(c) is a prescriptive mechanism for meeting Section 8.3.2.2 with fast response sprinklers around heat sources that are common in residential occupancies. The guidance in Table 8.3.2.5(c) is also applicable to non-residential situations. If you doubt the guidance in Table 8.3.2.5(c) for any particular non-residential situation, then you need to evaluate the temperature in the location where the sprinkler is going to go. Put a thermometer in that location and record the temperature after the light has been on for a long period of time (several hours). If the temperature exceeds 100 degrees, use an intermediate temperature rated sprinkler.

Question 12 – Inspection, Testing and Maintenance of Pilot Sprinkler Lines

A deluge system at our facility tripped because of various leaks on the air pilot lines. In reading NFPA 25, I do not see anything that specifically mentions maintaining or testing pilot lines. Should the pilot lines be tested and how? What do other facilities do?

Answer: The pilot lines are technically part of the detection system, which is required to be tested and maintained in accordance with NFPA 72. Unfortunately, that document does not have specific rules for testing or maintaining pilot detectors. Instead there are statements such as "test and maintain in accordance with manufacturers instructions". We'll try to clarify this in future editions of NFPA 25 and NFPA 72. But, since a dry pilot line is essentially a small dry pipe system, the same air leakage tests should be performed once every three years.

Upcoming NFSA "Technical Tuesday" Seminar – December 11th

Topic: Special Storage Sprinkler Systems

Instructor: Cecil Bilbo, Jr., NFSA Director of Technical Services

Date: December 11, 2007

There have been numerous types of sprinklers listed for use in Storage Applications in recent years. Now there are entire systems listed for use in Storage Applications. This seminar will discuss the many options available and the history behind their development. From Large Orifice, to Large Drop, to ESFR, to Big Box, to Antifreeze, all of the available options on the market will be discussed. Also included will be a conversation about "surrounding and

drowning” a fire. Understanding the limitations faced by all of these products will help you choose the best strategy for winning the next bid on a storage project.

Information and registration for this seminar is available at www.nfsa.org or by calling Dawn Fitzmaurice at 845-878-4200 ext. 133 or email: dawn@nfsa.org.

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 between now and the end of 2007:

Dec 11	Pumps for Fire Protection	Marana, AZ
Dec 12	Fire Pump Layout & Sizing (1/2 day) (A.M.)	Marana, AZ
Dec 12	Standpipe Systems (1/2 day) (P.M.)	Marana, AZ
Dec 13	Inspection, Testing & Maintenance	Marana, AZ

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

NFSA Announces Technical Tuesday Onlines for 1st Half of 2008

For the first half of 2008, the NFSA “Technical Tuesday” Online Seminars will carry a “Systems Update” theme, focusing on recent changes in system requirements. In each of ten selected subject areas, the seminars will feature an update on rules changes that are important to fire sprinkler contractors, technicians, and authorities having jurisdiction. The seminars will present information not only on the changes themselves, but in many cases on the research, deliberations and intentions behind the changes, which provide valuable insights needed for proper application.

Date	Topic	Instructor
Jan 29	Wet Systems	Victoria B. Valentine, P.E.
Feb 12	Dry and Preaction Systems	Russell P. Fleming, P.E.
Feb 26	Antifreeze System Updates	Kenneth E. Isman, P.E.
Mar 11	NFPA 13R Systems-Outside the Dwelling Unit	Cecil Bilbo, Jr.
Apr 1	Foam Sprinkler Systems Update	Russell P. Fleming, P.E.
Apr 22	Water Supply Systems	Cecil Bilbo, Jr.
May 6	Exposure Protection Systems	Russell P. Fleming, P.E.
May 20	Water Cooling Towers	Michael Friedman, P.E.
Jun 10	Standpipes, Pressures and Pumps	Kenneth E. Isman, P.E.
Jun 24	The Extent of Systems	Jeff Hugo

A 30% discount is available when signing up for all ten seminars in the series. Information and registration for this seminar series is available at www.nfsa.org or by calling Dawn Fitzmaurice at 845-878-4200 ext. 133 or email: dawn@nfsa.org.

Additional NFSA training opportunities include...

NFSA Two-Week Technician Training Classes

February 4-15, 2008 (waiting list only)	Centennial, CO
April 7-18, 2008	Orlando, FL
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 or by calling 845-878-4200 ext. 149 or email: Sprague@nfsa.org.

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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.