



Tuesday e-Tech Alert
August 14, 2007
Number 92

Best Questions of July 2007

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

Question 1 - Intermixing Control Mode and ESFR Sprinklers

Is it the intent of NFPA to require draft stops to separate ESFR sprinklers from standard response sprinklers, i.e. to separate suppression mode sprinklers from control mode sprinklers? Or can ESFR sprinklers be used in the same area as quick response sprinklers without the use of draft stops?

We've been speaking with an engineer on a project who feels the intent of NFPA was actually to separate suppression mode and control mode sprinklers through the use of draft stops as required by FM Data Sheet 2-2. FM is typically more restrictive than NFPA, however our particular project is not insured by FM and should not require that we follow FM guidelines.

Answer: The intent of NFPA 13 is very clearly to only require the draft stop between the ESFR sprinklers and the standard response sprinklers. The whole issue has to do with response time, not control mode. If the sprinklers on the control mode side of the building are quick response, then they will react to the fire before remote ESFR sprinklers even without a draft stop between them. Section 8.4.6.4.1 of NFPA 13 very clearly only requires the draft stop when the other sprinklers are “standard response sprinklers”. The language was new to the 1999 edition of NFPA 13 and was originally submitted from a member of the general public as applying to “standard spray sprinklers”. The committee specifically changed it to “standard response sprinklers” because they did not want to have the draft stop rules apply to quick response sprinklers.

While we cannot presume to interpret FM standards, we did look up the vote on the subject and the FM representative on the NFPA 13 committee voted in favor of the change. So they at least agreed that NFPA 13 should not require the draft stop when ESFR sprinklers are adjacent to quick response sprinklers.

Question 2 – Combustible Concealed Spaces Without Channeling

I have an open web wood floor truss less than 36 inches deep with no slope and a ceiling attached to the bottom which forms a horizontal combustible concealed space. The top chord of the floor truss is a 2” x 4” laying flat (1 ½” deep). Per Section A.8.14.1.6 of NFPA 13 (2002 edition) this does not channel heat. Is it acceptable to install standard spray sprinklers in this horizontal combustible concealed space?

Answer: According to the 2002 Edition of NFPA 13, the answer to your question is "yes," the space can be protected with standard spray sprinklers as the annex notes that heat is not considered to be channeled until the upper member is 2 inches in depth. However, this section (A.8.14.1.6) was deleted during the revision cycle to produce the 2007 Edition of NFPA 13.

Test reports were submitted to the Committee that showed fire in a horizontal combustible concealed space not controlled by standard spray quick response sprinklers even when the upper members of the truss were less than 2 inches in depth. Section 8.15.1.6 (previously 8.14.1.6) now describes the horizontal combustible concealed space and then states that sprinklers used in those spaces "shall be listed for such use." The language about channeling heat has been removed from the main paragraph. The combustibility of the upper surface of the concealed space poses a challenge to the fire sprinklers and therefore the Committee feels they need to be specially listed in order to handle the fire hazard in the space.

Question 3 – Size of Pump Mounting Pads

Does NFPA 20 govern the size (area) of the concrete pad mounting a vertical, centrifugal, limited service pump (similar in size to a jockey pump on a standard fire pump installation)?

Answer: No, NFPA 20 has no requirements for mounting pumps on pads. NFPA 20 simply mandates protection against flooding and vermin. That would be the reason most owners place pumps on "housekeeping pads". They can hose down the floor and keep anything from easily reaching the pumps this way.

Question 4 – Pressure Restricting Devices on Small Hose Connections

My question has to do with 1 ½-inch hose connections to sprinkler systems and whether there is a need to limit both static and residual pressures, or whether a simple pressure restricting device can be used. We have a building that has a fire booster pump and the normal sprinkler system static pressure is close to, but less than, 175 psi. We are proposing to install several 1 ½-inch fire hose racks supplied from these overhead sprinkler systems. We are required to use NFPA 13, 1999 edition, which states in Section 5-15.5.1.2 (4) "When the pressure at any hose outlet exceeds 100 psi, an approved device shall be installed at the outlet to reduce the pressure at the outlet to 100 psi."

Our local Fire Department is referring to Section A-5-15.5.1.2 of the NFPA's *Automatic Sprinkler Systems Handbook*, which states: "The pressure at the outlet is restricted to 100 psi due to the danger to the operator in using a hose subject to high pressure in either the static or underflow conditions. Therefore, the maximum allowable pressure at the hose outlet under both conditions is 100 psi."

Our contention is that a 1 ½-inch pressure restricting valve is an approved device that meets both of these conditions. The normally closed valve certainly protects the operator against the high static pressure, whereas upon flow the residual pressure is restricted below 100 psi by the valve itself. The local fire department is insisting that the code language "from the Handbook" as stated above is very specific about mandating a pressure regulating valve on these units, so as to address both the high static and residual pressures.

Answer: In our opinion the answer to your question is "yes", pressure restricting devices can be used. As you note, Section 5-15.5.1.2 (4) simply states, "When the pressure at any hose station outlet exceeds 100 psi, an approved device shall be installed at the outlet to reduce the pressure at the outlet to 100 psi." This sentence does have some ambiguity to it as static and/or residual pressure is not specified in the charging paragraph. Therefore, more information should be sought out. One source for additional information you have noted is the NFPA's *Automatic Sprinkler Systems Handbook*. Here the author of the commentary for this chapter suggests that both static and residual pressures need to be considered as high pressures since either case could cause danger or difficulty to the hose operator. However, the handbook is not an officially processed document of NFPA and it should be recognized that while the language was written by a Committee member, it was never reviewed by the entire Committee.

A better resource that could be utilized for review of this situation is NFPA 14 - *Installation of Standpipe and Hose Systems*. Although NFPA 13 is the governing document, it is important to be aware of what guidelines the Standpipe Committee offers on high pressures at hose stations, since hose connections and their safe use by firefighters are the primary focus of the that Committee. Section 7.8.3 of the 2007 edition addresses the maximum pressures at hose connections. This section applies to all standpipe classes, and similar language does exist in previous editions.

Section 7.8.3.1 states, "Where the residual pressure at a 1 ½-inch outlet on a hose connection available for trained personnel use exceeds 100 psi, an approved pressure-regulating device shall be provided to limit the residual pressure at the flow required by section 7.10 to 100 psi." This indicates that the residual flow must be maintained at or below 100 psi. By contrast, Section 7.8.3.2 states, "Where the static pressure at a hose connection exceeds 175 psi, an approved pressure-regulating device shall be provided to limit static and residual pressures at the outlet of the hose connection to 100 psi for 1 ½-inch hose connections available for trained personnel use and 175 psi for other hose connections." This section shows that there is a concern for high static pressures, but only for static pressures higher than 175 psi.

While NFPA 13 only calls for an "approved device," NFPA 14 calls for an "approved pressure-regulating device," which is defined in Section 3.3.8 as a "device designed for the purpose of reducing, regulating, controlling or restricting water pressure." The annex to this section provides examples of approved pressure-regulating devices, such as "pressure-reducing valves, pressure control valves, and pressure-restricting valves."

In conclusion, NFPA 14 is more specific than NFPA 13 in its consideration of maximum pressures for the 1 ½-inch hose connection. Both residual and static pressures do need to be considered, but provided the static pressure of the system does not exceed 175 psi then only the residual pressure needs to be regulated and held to 100 psi or less. If the system static pressure is greater than 175 psi, then both the static and residual pressures must be regulated to 100 psi or less.

Question 5– Moving Up the Curve for Nonsprinklered Combustible Spaces

A local AHJ is requiring a light hazard occupancy's remote area to be increased to 3000 sq ft due to the unsprinklered concealed space above the occupancy. The construction will not allow for sprinklers within the concealed space. Can I use the density/area curve at 3,000 sq ft and reduce the density to .07 gpm/sq ft?

Answer: Yes. The “discretion of the designer” is the determining factor for which density/area is selected from the curves. Sections 11.2.3.2.1.2 and 11.2.3.2.1.3 explain that only one point on the curve needs to be satisfied. Therefore, one option available to the design professional is to choose 0.07 gpm/sq ft over an area of 3,000 sq ft as an initial design criteria. In your case, the unsprinklered concealed combustible space requires a minimum 3,000 sq ft remote area. This would be an optimal way to utilize the density/area curves for your situation. The minimum 3,000 sq ft is required to be taken into account after all other adjustments are made to the remote area for items such as quick response sprinklers, dry systems, and sloped ceilings. In fact Section 11.2.3.7.2, clearly states that the 3,000 sq ft requirement be applied after “all other modifications have been made”.

Question 6 – Separation Between Occupancy Classification Areas

Is it the intent of NFPA 13 to require anything as a separation between areas for the purpose of determining room occupancy classification? Is a rated wall or an 8-inch lintel required? For example, in a restaurant with a self serve area, can the seating area be classified as light hazard even though it is open to a more hazardous area?

Answer: No, there is no requirement for any separation between different portions of the building that are protected with different hazard classifications. However, section 11.1.2 of NFPA 13 (2007 edition, similar sections in previous editions) requires that if you do not have a physical separation, you need to carry the sprinkler protection for the higher hazard 15 ft into the lower hazard space.

Question 7 – Restraint of Branch Lines in Earthquake Areas

NFPA 13 (2002 edition) Section 9.3.6 relates to restraint of branch lines where seismic bracing is required. Specifically, 9.3.6.3 states that the end sprinkler on a line shall be restrained against excessive vertical and lateral movement. Is this restraint required for ALL branch lines regardless of branch line length?

Answer: Yes, section 9.3.6.3 applies to all branch lines. There are two additional considerations for the application of this section:

- 1) Pipes to individual sprinklers are armovers, not branch lines. Since they are not branch lines, they are not subject to 9.3.6.3.
- 2) Branch lines large enough to have their own braces are not required to be additionally restrained because the braces are more than sufficient to also meet 9.3.6.3.

Question 8 – Upgrades to Existing Sprinkler Systems

A local industrial/business park consists of both newer construction buildings and an original War Department Supply Depot built in the early 1940s. The original buildings were fully sprinklered at the time of construction. These sprinkler systems were not provided with fire department connections, nor were any sprinklers provided under overhead doors. If changes to these existing buildings are not being made, under what circumstances could the local building/fire AHJ require that these items be added by the present user?

Answer: One of the primary methods of implementing upgrades to systems is when modifications are made to a building. However, you have indicated that no changes are being planned for these buildings. Another method would be for a local retrofit ordinance to be adopted. This would mean that within a certain time frame all buildings specified in the ordinance would have to be brought up to meet current code. However, this is fairly rare.

In general, it is not the practice to update all existing systems. When the building was constructed it was approved by the authority having jurisdiction and given its certificate of occupancy. As long as the hazard/commodity has not changed for the building then it is still considered an acceptable arrangement.

Question 9 - Rolled Nonwoven Fabrics

FM Global data sheets 8-23 cover protection for rolled nonwoven fabric storage. Is there anything in NFPA that addresses this type of storage?

Answer: Unfortunately, NFPA 13 does not cover rolled nonwoven fabrics. We also did a search through the electronic NFPA documents and the material was not returned in any of the other documents with further information. The FM guidelines may be your best source of information.

The option exists for the owner, supplier, or manufacturer to have the material tested and classified. Both UL and FM, as well as some international laboratories, offer the service of fire testing the product to see which standard class of commodity most resembles the product's burning and suppressibility characteristics.

Question 10 - Fire Pump Grouting

A question has been asked regarding grouting of a fire pump. A contractor has installed a fire pump at a skid type fire pump at a department store that has not been grouted. Is it necessary to grout? NFPA 20 Sections 6.5 and A.6.5 suggest it should be. What is your opinion on the matter?

Would any other NFPA requirements apply to ensure the pump be grouted? After looking in the code I find the grouting reference over and over, but in what case would the pump need to be grouted?

Answer: You have asked if a fire pump attached to a skid is required to be grouted. The answer to your question is "no." NFPA 20, 2007 edition, Section 6.5 talks about the alignment of the driver for the pump. The main emphasis on the paragraph is to follow the manufacturer's instructions to ensure that the pump is aligned properly and will therefore perform properly. The annex, Section A.6.5 refers to grouting the fire pump. It discusses how the grout can be used to align and hold shims and other pieces in place after alignment has been done. Grouting is a very common method for helping to achieve the proper alignment of the fire pump but if another method meets the goal and is not in conflict with the manufacturer's specifications then it could be used.

Question 11 – Inspecting Sprinklers in Inaccessible Occupied Areas

It has been our policy that when performing annual testing and inspections in apartment, condominium, or hotel/motel occupancies (for both NFPA 13 and 13R systems) that we inspect all commons areas, empty units, the sprinkler riser, FDC's, standpipes, etc. but we routinely do not enter occupied residential spaces (living areas) just to look at sprinklers. These areas are generally unoccupied and locked or occupied by the resident or guest. However, we can't find anything in NFPA 25 (2002 edition) that describes or allows this practice. A full inspection of every occupied room would be overly cumbersome and expensive at best, and we can't imagine having to perform such an inspection in a four star hotel with few vacancies or an apartment or condominium complex. Can you shed some light on this?

Answer: You have asked if it is the intent of NFPA 25 that all sprinklers are visually inspected, even in apartments, condominiums, hotels, etc, where the units could be occupied or inaccessible. The answer is "yes," NFPA 25 does intend all sprinklers to be visually inspected once a year. The chosen method to handle the inspections may vary with the type of occupancy being examined. For example, if an inspection is being done in an apartment building, then the owner can send notice to occupants that all units will need to be accessed on a certain day for inspection of the sprinkler system. Another way to handle apartments is to have the maintenance personnel inspect the sprinklers at the same time other work or services are being done in the unit. If this method is used, then it is best for the sprinkler contractor to have it noted in their service contracts that maintenance personnel will inspect units and that inspections of common areas, risers, standpipes, and flow will be completed by the service agreement.

In dealing with condominiums, a slightly different approach may be necessary as each unit will have a different owner. Here the condo association will have to find a way to handle all unit inspection, either with maintenance or possibly with a clause that makes each owner responsible for the portion of the sprinkler system in their unit. Again, service contracts should reflect which portion of the work will be completed by the contractor.

Hotels should be easier to handle. Typically, hotel staff enters all rooms on a daily basis. This should allow the inspector to complete the task of visually examining all sprinklers. However, if the owner prefers, the maintenance staff could also do the visual inspection of the rooms. This will depend on what portions of the inspection the owner wants to hire an outside contractor to do and what pieces they want to handle with their own staff.

In general the owner, or their representative, needs to be aware or made aware of what is required in the inspection. Then the contractor and owner can work out who will be responsible for the individual items of the inspection.

Question 12 – NFPA 13R Hose Stream Demand

We don't see any requirement for hose stream demands within NFPA 13R, but is it required that such demands be pulled in from NFPA 13 as part of the hydraulic calculation method? Does the presence of a standpipe system make a difference?

Answer: You are correct that hose stream demands are NOT required by NFPA 13R and the presence of a standpipe system makes no difference. An attempt was made to clarify this a few years ago when we added annex section A.6.8.2, which specifically reminds the user that there is no hose stream demand in NFPA 13R and that there is no intent to pull in the hose stream demand from NFPA 13.

Upcoming NFSA “Business Thursday” Online Seminar – August 16th

Topic: How to do Effective Strategic Planning

**Instructor: Don Pamplin, NFSA Northwest Regional Manager
(Former Fire Chief of Vancouver, British Columbia, Canada)**

Date: August 16, 2007

The majority of public and private sector organizations do not perform effective strategic planning. They think they do and in some situations, they even call it “strategic planning” but the planning model that they use is really not strategic. In the business world, the absolute bottom line is to make a profit and the more profit you consistently make, the better insulated you are from the disastrous effects of economic and social change. By practicing effective and efficient strategic planning, you can be better prepared to change direction to meet new markets demands and technology shifts. All business organizations within the Fire Sprinkler Industry need to use effective strategic planning to create a realistic and achievable road map to lead them to where they want to be in five or ten years.

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

Upcoming NFSA “Technical Tuesday” Online Seminar – August 21st

Topic: Concealed Space Area Calculations

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

Date: August 21, 2007

There are many different requirements for defining the remote areas of a sprinkler system when concealed spaces are present. This seminar will discuss the calculation of sprinkler systems when there are concealed spaces present. It will define concealed spaces and explain the differences between the types of concealed spaces. In addition, the 3,000 sq ft rule and how eaves and overhangs affect these decisions will be included. Also, optional methods of protection for these spaces will be reviewed.

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

NFSA Technician Training Classes

The two-week NFSA technician training class scheduled for September 24- October 5 in Kansas City, MO, is completely full at the present time, and a wait list is being developed. However, the extra class added for November of 2007 in Newburgh, NY still has availability. These seminars also serve as starting points for the NFSA’s two-year Certificate Program for Fire Sprinkler Technicians.

Only the following classes remain in the 2007 NFSA engineering department training schedule:

Two-Week Technician Training Seminar

November 5-16 Newburgh, NY

3-day Advanced Technician Training Class

September 5-7 St Louis, MO

NICET Inspector Certification Review Classes

November 6-8 Providence, RI

For more information on any of these classes, contact Nicole Sprague at 845-878-4200 ext. 149 or email Sprague@nfsa.org.

In-Class Training Seminars

NFSA also offers in-class training on a variety of subjects at locations across the country. Here are some upcoming seminars:

Aug 16	Hydraulics for Fire Protection////Centerville, OH
Sept 11	Inspection, Testing & Maintenance////Brea, CA
Sept 13	Sprinklers for Dwellings////Brea, CA
Sept 18	Sprinkler Protection for General Storage////Seattle, WA
Sept 19	Sprinkler Protection for Rack Storage////Seattle, WA
Sept 20	Pumps for Fire Protection////Seattle, WA
Sept 18-19	Two-day NFPA 13 Overview & Intro to Plan Review////Baltimore, MD
Sept 20	Pumps for Fire Protection////Baltimore, MD
Sept 25	Sprinkler Protection for General Storage////Eugene, OR
Sept 26	Sprinkler Protection for General Storage////Eugene, OR
Sept 27	Inspection, Testing & Maintenance////Eugene, OR
Oct 23	Introduction to Sprinkler Systems (1/2 day)(AM)////Woodland, CA
Oct 23	Underground Piping (1/2 day)(PM)////Woodland, CA
Oct 24	Inspection, Testing & Maintenance////Woodland, CA
Oct 25	Basic Seismic Protection (1/2 day)(AM)////Woodland, CA
Oct 25	Advanced Seismic Protection (1/2 day)(PM)////Woodland, CA
Oct 30-31	Two-day NFPA 13 Overview & Intro to Plan Review////Spokane, WA
Nov 1	Sprinkler Protection for Special Storage////Spokane, WA

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

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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.