e-TechNotes

Editor-Russell P. Fleming, P.E. *Issue No. 232* *Issued: February 14, 2012*

Best Questions of January 2012

We have selected the following questions as the "Best of January 2012" answered by the engineering staff as part of the NFSA's EOD member assistance program:

Question 1 – Water Spray Systems for Cable Galleries

Please advise if a deluge water spray system is required for cable galleries if the cables are protected with fire proof spray paint.

Answer: We are not aware of specific fire or building code requirements for water spray systems in cable galleries. Typically, such systems are a part of an overall fire protection plan developed for a facility by an engineer (usually in consultation with an insurance company) following a risk analysis that includes the owner's concerns over shutdown or potential loss of the cables. In cases such as nuclear power plants, regulatory authorities might require such systems. The determination as to whether or not to protect cable galleries with a water spray system would depend on the risk analysis, which would take cable materials and coatings into account.

Question 2 – Sprinklers Under Foldable/Collapsible Bleachers

A recreation center gymnasium has a ceiling height of 30 ft and a cantilevered elevated running track around the perimeter at a 15 ft height. Upright sprinklers are being installed under the gymnasium ceiling and in the beam pockets below the track. If foldable/collapsible bleachers are installed intermittently beneath the running track, are sprinklers also required inside the bleachers? The bleachers will be constructed of wood or plastic, and will be about 6 ft high.

Answer: The bleachers are not fixed in place in their open position. As an obstruction, they only exceed 4 ft in width on a temporary basis and therefore do not require sprinkler protection within them.

Question 3 – Sprinkler Omission from Breezeways

I have a question about the requirement for sprinklers in breezeways. In a new two-story community college building, the first floor is being built with three (3) breezeways that run under the second floor. The construction is of steel beam and open web steel joist, and metal deck with concrete poured floors, and the exterior finish is stucco. The concealed space above the breezeway is filled with fiberglass batt insulation. Are we allowed to omit sprinklers in accordance with NFPA 13 (2010 edition) Sections 8.15.7.2 and 8.15.1.2.1?

Answer: Yes. Breezeways are treated like balconies on the exterior of the building, so Section 8.15.7.2 applies to the area under the breezeways. The concealed space within the breezeway construction would appear to comply with Section 8.15.1.2.1.

Question 4 – Owner's Responsibility for Water Quality

We have a project that has been found to have water quality issues. We are of the opinion that per NFPA 13, this should have been discovered during the production of the "Owner's Certificate" and that the responsibility is on the owner or owner's representative to determine this in advance of any design or construction, since pipe type selection and treatment measures for all building systems, not just the fire sprinkler system, is critical to the life of the building. Even if the project is design-build, we believe the owner is responsible to have performed whatever water quality tests are appropriate so as to provide the subcontractor with this information. Are we correct?

Answer: We agree that NFPA 13 declares it the owner's responsibility to determine if there are any specific corrosion issues with the water before a sprinkler system is designed. If such an issue exists, it needs to be flagged prior to the design of any of the building systems that will use that water, regardless of whether the building is being constructed under "design/build" circumstances. While the building owner is generally not knowledgeable enough to conduct this evaluation themselves, they have an architect or engineer take on this responsibility at the beginning of the project.

The situation is analogous to performing a soil sample analysis prior to deciding to construct a building. Before deciding to build, the owner needs to assess the property and make sure that a building can be constructed on the site. The situation is the same with the water being used for the building. Someone needs to evaluate the water to see if it can be used.

Within the contract between the owner and the architect or project engineer should be language that identifies the architect's or project engineer's responsibilities as to determining the applicability of constructing a building in that particular location for that particular purpose. It would be part of that contract for the architect or project engineer to discover any problems with the site that would require any special design procedures. The water being used for the building systems would be considered part of the site evaluation.

Question 5 – ESFR Sprinklers for Movable Racks

Can ESFR sprinklers at the ceiling only protect 25 foot high mobile storage racks for a Class IV commodity? What about Group A plastics? These racks roll on wheels in tracks stacking against each other, providing a moveable aisle for access.

Answer: If the racks are open racks (no solid shelves) then there is no difference between such racks and multiple row racks. Since ESFR sprinklers can protect multiple row racks, they can protect these as well. If solid shelves are present, then the only way to use ESFR sprinklers would be in accordance with Section 20.7, which was a special test series on a specially designed mobile storage rack with solid shelves of a specific size (see Figure A.20.7.1 for a picture of the racks tested).

Question 6 – Red Tags on Sprinkler Systems

As an AHJ, I have a three-story apartment complex in my jurisdiction with 450 units and an NFPA 13R sprinkler system. The complex has always maintained all of their life safety systems in excellent condition since it was built about five years ago. Recently a fire sprinkler contractor informed the condo association that they will need to go into each and every unit to inspect the fire sprinklers as part of an

annual inspection. The maintenance supervisor at the property advises that, in the past, they rotated the units that were looked at, typically 30% of the units each year, not 100%. The fire sprinkler contractor advised that unless they are able to look at each and every unit the system will be “red tagged.” Here in the State of Florida it has always been my interpretation that the "red tag" meant that the system was "impaired or non-functional as installed," and that the red tags were not to be used for minor maintenance issues. I have researched NFPA 25 but have not found information that specifically states that it is mandatory to look at every sprinkler every year. As you can imagine, this is going to be a very labor intensive and extremely costly to the apartment complex because they will have to go into all of the units. Can you please direct me to any code reference or section that might apply to this situation? More importantly, is it typical of most fire sprinkler companies to operate in this fashion?

Answer: Section 5.2.1 of NFPA 25 requires the annual inspection of all of the sprinklers on a system (100%). However, this section does not require that the sprinklers be inspected simultaneously, and it does not absolutely require that the sprinkler contractor perform this inspection, since a qualified maintenance person could also inspect the sprinklers.

Unit tenants and owners realize that there are many times that the landlord or condo association needs to have access to their units, for issues such as HVAC maintenance, pest control, structural inspections, etc. Notice is usually required in advance for such access, and there is often the opportunity to schedule alternate times. As such, the time of the sprinkler contractor’s inspection should be made known to all condo owners. If they cannot provide access, they need to schedule an alternate time when someone can come in and inspect the sprinklers.

Inspection of the sprinklers is not difficult. The contractor is checking from floor level to make sure the sprinklers are not damaged, painted, corroded, or loaded with foreign material.

While NFPA 25 calls for a tagging system to indicate system impairments (Section 15.3 in the 2008 edition), colors are not specified. You are correct that red tags are traditionally used to indicate impaired systems, but a state or municipality could decide its own marking system. In any event, the failure to inspect all of the sprinklers is not considered a system impairment.

The contract between the contractor performing the inspection and the owner should be clarified to state that the contractor is only responsible for inspecting the sprinklers in the rooms to which he has access. The contract could stipulate that the unit owners or the condo association will assume responsibility for the other inspections.

Question 7 – Sprinklers for Tanning Beds

A question has come up about the need for sprinklers in standing tanning booths with attached dressing rooms in otherwise sprinklered buildings. On the one hand, these are considered pieces of equipment which should not require sprinkler protection within the units themselves, which are protected by the building sprinkler system. On the other hand, the dressing room is an occupied space and would appear to require sprinklers per NFPA 13. I have looked at obstruction rules in NFPA 13, read the handbook regarding not providing sprinkler coverage in dwelling unit bathrooms (a potentially comparable occupied, non-sprinklered space situation), and searched for studies online, all to no avail. Should the sprinkler requirement be determined on a case-by-case basis since the construction will vary per manufacturer? Do you know of any rulings or studies regarding this type of situation?

Answer: Most of these dressing rooms and booths are rooms and need to be sprinklered under NFPA 13 Section 8.1.1(1). An exception would be the tanning bed itself, which would be treated as a piece of

furniture. The sprinkler in the room would be expected to cover the entire floor area, including that occupied by the tanning bed.

If you call a tanning room a piece of equipment or furniture and then do not sprinkler it, then how is that floor space being protected by sprinklers? If there are sprinklers above that tanning room that cover the floor space of the tanning room, what hazard classification are you going to use for those sprinklers? By the time a fire in the tanning room breaks out above the equipment, is a light hazard design going to control that fire? What's to prevent an owner from turning the tanning room into storage space as fewer people use their services?

An AHJ might accept an alternative to putting sprinkler protection in the tanning booth if a sprinkler is installed in the space above the booth to cover the floor area that would exist if the booth were removed, and if the sprinkler protection is designed for Extra Hazard Group 2. Section 5.4.2 allows for this design condition, which is how we traditionally handle large obstructions too difficult to equip with sprinklers, such as manufactured home assembly facilities.

Question 8 – Ceiling Slope Increase for Aircraft Hangars

Is a 30% increase in design areas necessary for sprinkler protection being installed to conform to NFPA 409 and NFPA 13 Section 21.24? We are working on a hanger bid and we need to confirm if a 30% increase for a sloped ceiling must be used. I find no specific reference in NFPA 409 for this increase. NFPA 13 Section 11.1.4.1 (3) refers to Chapter 21 for special occupancy approaches. NFPA 13 Section 21.24 refers to NFPA 409 for aircraft hangar design requirements. NFPA 409 does not show a 30% increase factor. It appears that the reference in NFPA 13, Section 11.2.3.2.4 for sloped ceilings is for designs using the area/density method as described in that chapter.

We are being told by the fire protection engineer for the project that the 30% increase is required based upon the requirement for increasing the remote area by 30% in NFPA 13. He states that just because you meet NFPA 409 it doesn't mean the requirements of NFPA 13 are void, so he feels that the 30% increase is still valid

Answer: Section 11.2.3.2.4 of NFPA 13, which is the only section of NFPA 13 that has a 30% increase for roof/ceiling slope, only applies to light, ordinary or extra hazard occupancies. Since an aircraft hangar is not a light, ordinary or extra hazard occupancy, this section does not apply. While the installation rules of NFPA 13 certainly apply to sprinkler systems in aircraft hangars (rules like hanging and bracing the system, the type of pipe you can use, and the methods for joining the pipe), the discharge rules (flow, pressure and number of sprinklers in the design area) are only supposed to come from NFPA 409. None of the rules in Chapters 11 through 20 are applicable to aircraft hangars.

Question 9 – Quarterly Inspections of Backflow Preventers

Does the presence of a backflow prevention device on a sprinkler system somehow create a requirement for quarterly sprinkler inspections? A local insurance company appears to be telling their customers this, but I am not aware of the connection between backflow prevention devices and quarterly inspections.

Answer: All fire sprinkler systems are required by NFPA 25 to have a quarterly inspection and test. There are a number of items involved in this quarterly inspection and test, including verifying that the fire department connection (FDC) is in good shape, making sure alarm devices are free from damage, and that the alarm devices sound an alarm when water flows (although this last one is a semi-annual test in some editions of NFPA 25 for some types of systems).

When a backflow device is added to a sprinkler system, an additional quarterly test is required by NFPA 25. This additional test is a main drain test. The sprinkler system without the backflow preventer is required to have a main drain test annually. With the backflow device, the test has to be done quarterly in order to give more exercise to the internally loaded check valves in the backflow device.

Perhaps the insurance company is using a version of NFPA 25 where the alarm test is semi-annual and they don't care about the inspection of the FDC. In this case, they might not have cared about the quarterly inspection and testing items. But if a backflow device is added, they care about the quarterly main drain test on the sprinkler system.

Question 10 – Pump Transfer Switch with Single Power Supply

We have been asked to install a controller with a transfer switch, but the pump has only a single power supply. Is this permitted?

Answer: Such an installation would be rare considering the extra cost, but it would not violate any rules. Perhaps the specifying engineer anticipates the installation of a future second power supply and wants to make the connection easy. It is also possible that the specifying engineer made a mistake. But there should be no concern about the operation of the controller. If the power goes out and comes back, the transfer switch will automatically switch back to the main power supply.

Question 11 – IFC Chapter 34 Requirements for Diesel Fire Pump Tanks

Have you ever heard of Chapter 34 of the International Fire Code being enforced on a small diesel storage tank that feeds a diesel fire pump? An AHJ is requesting spill control, secondary containment, overfill prevention, fill line auto-shutoff, reduced flow rate, etc. on a 70 gallon diesel tank for a 250 gpm fire pump

Answer: Every once in a while, the issue of Chapter 34 in the IFC comes up with respect to fire pumps. The overwhelming majority of AHJ's do not enforce this portion of the IFC for diesel tanks for fire pumps because this article was not written specifically for diesel tanks for fire pumps. Chapter 34 is a general portion of the code intended to deal with a wide range of flammable and combustible liquids.

As a general rule of law, a specific code provision always supersedes a general provision. In fact, the IFC specifically comes out and says this in Section 102.9 in the 2006 edition (102.10 in the 2009 edition). The code states: "Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable."

In this case, Chapter 34 is a general requirement with respect to diesel tanks for fire pumps. The specific requirement is in Section 913.1, which requires that fire pumps be installed in accordance with NFPA 20. Since NFPA 20 (Section 11.4) contains the provisions for secondary containment, overfill protection, vents, etc., this more specific provision is what is intended to be enforced for diesel tanks for fire pumps.

For the 2010 edition of NFPA 20, the fire pump committee specifically rewrote Section 11.4 to clarify some of the more confusing aspects of diesel tank design and installation. The NFPA 30 committee then reviewed the work of the NFPA 20 committee and added NFPA 20 to their list of documents that are "deemed to comply" with NFPA 30. This means that if you follow NFPA 20 and do all of the things required in that document, you are automatically in compliance with NFPA 30. Since NFPA 30 has the same objectives as Chapter 34 of the IFC (in fact it is constantly referenced by that chapter), the intent of the code is clearly met by simply complying with NFPA 20.

Question 12 – Glass Bulb Sprinklers in a Firing Range

I'm working on a project where a firing range is being installed in a warehouse. The firing range installer is concerned that the glass bulb of the sprinklers could break from the percussion of the gunfire. Have you ever heard of this before?

Answer: We were previously unaware of such concerns. However, sprinklers are not tested for their ability to withstand high decibel noises, and there is nothing in NFPA 13 that specifically addresses this issue. If needed, solder link sprinklers could be specified, and standard response sprinklers may be preferable to fast response sprinklers. A similar situation is recognized in Section A.9.12.12.2 of NFPA 909 for protection of libraries and museums, which recognizes that "standard response sprinklers employ more robust operating elements than quick-response sprinklers and can be more appropriate for use in areas where concern for inadvertent water discharge outweighs the advantages of thermal sensitivity."

Upcoming NFSA "Technical Tuesday" Seminar – February 21st

Topic: Pressure Control in Buildings with Standpipe Systems
Instructors: Victoria Valentine, P.E. – NFSA Director of Product Standards and John Corso, NFSA Training Manager
Date: Tuesday, February 21, 2012- 10:30 am EST

This seminar will begin with a review of the pressure requirements for standpipe systems, and will address the ways in which pressure is controlled for the use of standpipe systems by fire departments and, in some cases, the general public. The definitions of various terms like pressure reducing, pressure control, pressure restricting, direct acting and pilot operated will be provided, with the limitations of the corresponding devices clarified. The rules relating to configurations of zones, valves, pumps and drains will be explored, with examples provided of the arrangements allowed by the standards.

To register or for more information, click **HERE** or contact Michael Repko at (845) 878-4207 or e-mail to **seminars@nfsa.org**.

Layout Technician Training Course (2-week course)

Fishkill, NY – October 8-19, 2012

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

Upcoming In-Class Training Seminars

The NFSA training department also offers in-class training on a variety of subjects at locations across the country, and in recognition of the current recession has adopted a new reduced fee structure. Here are some upcoming seminars:

Feb 28 *(SPECIAL RATE!!)*	Charleston, SC	Inspection, Testing & Maintenance for the AHJ
Mar 1 *(SPECIAL RATE!!)*	Raleigh, NC	Inspection, Testing & Maintenance for the AHJ
Mar 6-8	Apple Valley, MN	3-Day Inspection & Testing for the Sprinkler Industry
Mar 6	Pataskala, OH	Inspection, Testing & Maintenance for the AHJ
Mar 7	Pataskala, OH	Hydraulics for Fire Protection
Mar 8	Pataskala, OH	Sprinkler Protection of Special Storage
Mar 13 *(SPECIAL RATE!!)*	Louisville, KY	Inspection, Testing & Maintenance for the AHJ
Mar 13	Winston-Salem, NC	Hydraulics for Fire Protection
Mar 14	Winston-Salem, NC	Plan Review Policies & Procedures
Mar 20	Meridian, ID	Inspection, Testing & Maintenance for the AHJ
Mar 21	Meridian, ID	NFPA 13, 13R & 13D Update
Mar 22	Meridian, ID	Basic & Advanced Seismic Protection
April 10-11	Willoughby, OH	Two-Day NFPA 13 Overview
April 12	Willoughby, OH	Inspection, Testing & Maintenance

These seminars qualify for continuing education as required by NICET, and meet mandatory Continuing Education Requirements for Businesses and Authorities Having Jurisdiction.

To register for these in-class seminars, click **HERE.** Or contact Michael Repko at (845) 878-4207 or e-mail to **seminars@nfsa.org** for more information.

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.