NATIONAL FIRE SPRINKLER ASSOCIATION, INC.

# Tuesday e-Tech Alert
# June 5, 2007
# *Number 85*

## Best Questions of May 2007

We have selected the following questions as the "best of May 2007" answered by the engineering staff as part of the NFSA "Engineer of the Day" member assistance program:

### Question 1 – Allowable Shadows in Sprinkler Protection Areas

We recently had a conversation about the allowable amount of shadowing allowed by NFPA 13 (2007 edition) for residential, light, and ordinary hazard occupancies. Can you provide a clarification if small shadows are allowed?

**Answer:** A very small floor shadow should have no significant impact on the ability of a sprinkler to control a fire. While NFPA 13 does not directly address concerns such as these, there is much to be inferred from this committee and others. A good example would be the understanding that the 13R committee shows when they allow the omission of sprinklers in "architectural features" such as bay windows and planter box windows. These rules allow for unprotected floor space when the sprinkler is known to cover the area around the feature. The understanding that the sprinkler can overcome certain "footprint shadows" is important to good fire sprinkler system design. The understanding that the system you intend to install is a "control" system and not a "suppression" system is another important factor leading to the very decision you have made. The NFPA 13 committees have shown that obstructions may be rendered negligible by correct placement of sprinklers. As shown in NFPA 13 – 5-6.5.2.2, a two foot wide column can have a sprinkler located a mere two feet from the face of the column. The sprinkler on the opposite side of the column may be placed at a distance allowing maximum spacing between sprinklers without considering the obstruction. If one were to consider the 'shadow' as unprotected in this instance, it would take as many as four sprinkler heads placed symmetrically around the column to provide adequate protection. Studies have shown that the water spray has momentum that helps to overcome certain interference. Chapter 5-6.5.2.2 states, *"Sprinklers shall be positioned such that they are located at a distance three times greater than the maximum dimension of an obstruction up to a maximum of 24 in."* The commentary offered in the handbook clearly states that some dry shadow is allowed.

### Question 2 – Mezzanine Storage

We would appreciate your interpretation of NFPA 13 regarding sprinkler protection above and below a mezzanine. We have a situation in a lumber warehouse with two separate mezzanines, one with grating and one with plywood on wood joists. Both have miscellaneous storage, 10 feet or less in height. Sprinklers are being provided both at the roof and below the mezzanines. The AHJ is requiring the storage above and below to be added, thus creating a storage height exceeding 12 feet, which is high pile storage. The plan reviewer said they have gotten that

interpretation from NFPA. We have never heard of adding the two separate areas above and below a mezzanine and classifying the total as high pile storage. Please review and provide any interpretations or relevant information.

**Answer:** Typically, we rely on the building code to define the pieces of a structure, such as a mezzanine. The definition of a mezzanine in both of the available model codes is similar: "an intermediate level or levels between the floor and ceiling of any story with an aggregate floor area of not more than one-third of the area of the room or space in which the level or levels are located." It is a common assumption to think of a mezzanine in a building as having a solid floor as part of its construction, but there is no reference to a solid floor, and this creates a gray area with regard to grated floors.

It is agreed that if the floor of the mezzanine is solid then the heights of storage should be treated separately. The solid floor allows for heat collection and rapid operation of the fire sprinklers as intended by the standard and its installation criteria. Section 8.2.2 of NFPA 13 (2007 edition) notes that "The floor area occupied by mezzanines shall not be included in the area limits of 8.2.1." This separation is because the mezzanine creates an intermediate floor level.

However, the scenario of a grated floor between two levels of storage is similar to having catwalks or walkways at different levels throughout the storage height. Heat and flame from a fire in the lower level can spread the fire to the upper level of storage and create a higher hazard. NFPA 13 would, with the walkway scenario, require the ceiling sprinklers to protect the entire height of the storage from the main floor level. Additional sprinklers would be located below the walkways on the basis that they create obstructions to the ceiling sprinklers.

As with many other areas of NFPA 13, the AHJ will ultimately determine if the grated separation in storage can be considered a true mezzanine floor. The AHJ may well make this determination on the relative height of storage under the grated area, i.e. whether the storage is so close to the underside of the grated floor as to effectively provide a single fuel load, with a potential path of flame travel from below the mezzanine to the area above.

**Question 3 – Nitrogen Leakage Rates for Dry System**

NFPA 13 contains requirements for air testing dry systems and the allowable leakage.
What is the allowable leakage for nitrogen?

**Answer:** The physical properties of air and nitrogen are similar enough to use the same rules. We allow a drop in air pressure even though we do not allow a drop in water pressure for a number of reasons. Air will compress while water will not. Air may find its way out of threaded connections while water will not. So, we have different rules for air and water regarding the maintenance of pressure in the system and making sure that the system is tight. But air and nitrogen are very similar in how they compress and find their way out of spaces. In fact, air is mostly nitrogen to start with. The rules for the pneumatic test are the same for both air and nitrogen regarding the pressure to start the test (40 psi) and the pressure loss acceptable during the test (1.5 psi in 24 hours).

**Question 4 – Wet Systems Fed From Dry Systems**

I have a competitor that plans to tie a wet system into a dry system. What he wants to do is install a check valve, flood the dry system to charge the new piping with water, and then drain the dry system between the check valve and riser and make it dry again. I have looked and can't determine if this is legitimate or not. Is there a loophole that I'm missing or is this just wrong?

**Answer:** The system that you have described would not meet the definition of a wet pipe system. Water would not flow continuously from the piping if a sprinkler opened. Water would flow for a few seconds (not at any acceptable pressure) and then be replaced by air starting to leave the dry-pipe system.

The system would be considered a dry-pipe system, but a dry system with a substantial amount of trapped water. Chapter 8 of NFPA 13 requires all dry-pipe systems to be pitched to a drain, and does not allow the use of check valves to subdivide the system volume. So there are no loopholes. While a dry system can be extended from a wet system, the reverse is not allowed.

**Question 5 – Hazard Classification of an Optometrist's Office in a Mall**

We're working on a retrofit of leased space in a mall that is going to be an optometrist's office. Would the exam rooms fall under the ordinary hazard group II occupancy used for a mercantile space or would they fall under light hazard for offices?

**Answer:** In many states, hazard classification must be decided by a design professional. The hazard classification is going to vary with the quantity and combustibility of materials expected within the space. The examples within NFPA 13 can be used for guidance. If the amount and combustibility of materials and equipment within the space is typical of an office space then it would be considered light hazard. If the amount and combustibility of materials is determined to be more similar to a traditional mercantile use, then it would be considered ordinary hazard Group 2. The fact that the protected space is within a shopping mall is not a factor in making the hazard classification of the space. However, caution must be used in buildings containing more than one hazard classification. Section 11.1.2 of NFPA 13 (2002 edition) states, "For buildings with two or more adjacent occupancies that are not physically separated by a barrier or partition capable of delaying heat from a fire in one area from fusing sprinklers in the adjacent area, the required sprinkler protection for the more demanding occupancy shall extend 15 feet beyond its perimeter." The AHJ for the project should approve the separation.

**Question 6 – Draft Stop Material**

A four-story building for condominiums is being constructed with an NFPA 13 system (2007 edition). Nonmetallic sprinkler pipe is being used between the floors. Concealed spaces are formed by a ceiling attached to composite wood joist construction, and Section 8.14.1.2.6 allows omission of sprinklers from these combustible spaces, but what about the hole through the TJI that is made due to the installation of the plastic pipe? Does this section in the standard require that the composite wood joist construction have all penetrations sealed if the joist channel is not fully filled with insulation? Another question: can the space above the required 3-1/2 in. of batt insulation can be considered the area to be calculated for the volume limitation of 160 cubic feet per section 8.14.1.2.8? The local AHJ's interpretation is that the batt insulation is needed to address the air gap from the resilient channel and the total depth of the joist construction must be calculated for the volume of the joist space. Is any information available for a better understanding?

**Answer:** With respect to the penetration issue, the requirement is to provide a draft stop that is the same quality material as the web. Holes can be cut in the web without sealing the penetration and so the same is true for the draft stop. The purpose of the draft stop is to impede the momentum of the hot gasses from a fire that might get into the space from racing down the channel. These hot gasses will be impeded and their momentum will be slowed even if there is a small annular space around the sprinkler pipe that is open. That being said, this is not a license to leave a vastly oversized hole. The annular space around the pipe should be minimized, but there is no requirement to seal the penetration with any particular fire resistive material.

The volume to use in the calculation of the 160 cubic feet is the full volume of the channel regardless of the insulation. You can see this intent in the previous edition of the standard prior to the language about the metal channels being installed. The 160 cubic feet needs to be calculated as if the insulation is not present.

**Question 7 – Clearances Less than 18 inches**

I'm trying to help a client justify a situation where the distance from the sprinkler deflector to the top of some movable shelving units is 10 in. instead of the required 18 in. The client has tried to compensate by reducing the sprinkler spacing to 4 ft along the branch lines, which run perpendicular to the shelves, installing baffles between the sprinklers to overcome the spacing being less than 6 ft. Does NFSA have any information on sprinkler discharge pattern development at distances less than 18 in.?

**Answer:** Some distribution information is available on discharge pattern development in such small spaces, but it is not good, which is why we require the 18 inch clearance. From the diagram in section A.8.5.5.1 in NFPA 13 (2007 edition, similar diagram in many previous editions) you can see that the spray pattern of a sprinkler reaches an approximate distance of 4 ft horizontally from the sprinkler at a distance of 18 inches below the deflector. If you are only allowing 10 inches of clearance, even if shortening the distance between sprinklers to 4 ft, you would still be allowing significant dry spaces of potentially burning fuel.

While developing the 2007 edition of NFPA 13, the sprinkler committee worked on a number of rules for dealing with these compact shelf arrangements, including the common problem of a lack of clearance between the top of the shelving and the sprinkler deflectors. At one point the committee proposed a potential solution to limited clearance based on Canadian research involving the use of sidewall sprinklers to spray across the space rather than relying on pendent sprinklers. However, this option was removed during the public comment period and the entire section on protection of compact storage was essentially held for further study based on the protests of the affected industry. A new test program on sprinkler protection of compact storage is currently being organized through the NFPA's Fire Protection Research Foundation. At the present time, however, NFPA 13 retains its 18 inch minimum clearance requirement.

**Question 8 – Sidewall Sprinklers Below Overhead Doors**

NFPA 13 (2002 and 2007 editions) Section 8.4.2(3) permits sidewall sprinklers to be used "to protect below overhead doors". What is the purpose of the sidewall sprinkler below overhead doors? To detect the fire and sound the alarm, or to put out the fire? Spacing is allowed to be

light hazard even in ordinary hazard occupancies so that a single sprinkler may be used. Very little information is provided for storage and extra hazard applications. If the purpose is to detect the fire and sound the alarm with the overhead protection controlling the fire, the light hazard spacing for the sidewall sprinkler is acceptable. If the purpose is to put out the fire, a single sidewall sprinkler is not adequate. But installing upright or pendent sprinklers requires a minimum of two and presents hanger and spacing issues that defeat the purpose of the protection below temporary obstructions.

The NFPA 13 Handbook (2002 edition) states in the commentary "sprinklers need to be positioned so that their discharge can adequately reach under the overhead door." (2002 edition, 8.5.5.3.2; p 211). This really becomes complicated when most overhead doors are several feet minimum below the roof deck. Special sprinklers such as ESFR present additional complications and hydraulic calculation issues.

Are sidewall sprinklers acceptable below overhead doors regardless of hazard classification as indicated by 8.4.2(3)? If storage or special sprinklers are positioned at the roof to adequately protect the floor area below the overhead door when it is closed, is another equal layer of coverage required to protect below the overhead door when it is open? Or is the sidewall sprinkler combined with the overhead protection adequate to protect the area below the door which only has temporary storage during the loading/unloading or servicing process? Please discuss any information available to clarify the concern of the AHJ wanting full sprinkler protection below overhead doors to match the overhead requirements for density and spacing.

**Answer:** First of all, NFPA 13 allows sidewall sprinklers to protect under overhead doors regardless of the occupancy. The section that covers this in NFPA is 8.4, which applies to all occupancy hazard classifications unless some limitation is specifically stated. For section 8.4.2(3) there are no such stated limitations, therefore the section applies to all types of buildings. Second, the sidewall sprinkler can be used to protect under the door regardless of the type of sprinkler at the ceiling. Again, this statement is made due to the placement of the provision in section 8.4. If the committee had only wanted to allow the sidewall sprinkler when specific sprinklers were at the ceiling, they would have placed the provision in section 8.6, 8.8, 8.9, 8.10, 8.11 and/or 8.12. The purpose of the sidewall sprinkler is to provide some flow of water under the door when the door is in the open position. There is no intent on the committee's part to make the sprinkler flow the same density as the ceiling sprinklers. In some cases, the storage under the door is limited when the door is in the open position because the door does not allow the same height of storage as when the door is closed. The floor area under the door still needs to be within the protection area of ceiling sprinklers. These sprinklers will still be able to provide some protection, even when the door is open and obstructing the ceiling sprinklers. Since the goal of most sprinkler systems is fire control, not suppression, the ceiling sprinklers, in addition to the sidewall sprinkler, should be able to control any fire that happens under the door without requiring any specific density from the sidewall sprinkler.

With ESFR sprinklers, the situation is somewhat different because the objective is fire suppression rather than fire control. In this case, NFPA 13 does not require any specific density, although a specifying engineer could ask for additional protection under the circumstances. If the specifying engineer has not asked for any additional density considerations for the sidewall sprinkler, it is inappropriate for the AHJ to do so. The specifying engineer should be considered to have evaluated the situation and determined that it is not a concern, perhaps due to the limited use of the space under the door for storage or because of the limited potential for the door to be open for any significant period of time. With ESFR sprinklers used at the ceiling, the water

supply will need to be increased, which should help to increase the discharge from the sidewall sprinkler. Section 22.4.4.6.4 requires two sprinklers under the obstruction to be added to the ESFR demand at the ceiling. The pressure requirements for the ESFR sprinklers will result in significant discharge from the sidewall sprinklers when added to the calculations.

**Question 9 – Changes in Rules for Patient Room Privacy Curtains**

This question is in reference to the change in NFPA 13 from the 2002 edition to the 2007 edition regarding requirements for the mesh in privacy curtains; specifically, how the vertical distance of the mesh is measured. The 2002 edition refers to the vertical distance below the sprinkler deflector, while the 2007 edition refers to the vertical distance below the ceiling.

NFPA 13 (2002 edition), section A.8.6.5.2.2 states, "The use of mesh can affect the discharge pattern of the sprinkler. Top mesh can be used when it has a minimum vertical distance of 18 in. below the sprinkler deflector with mesh openings having a minimum percent opening of 70 percent or larger."

NFPA 13 (2007 edition), section 8.6.5.2.2.1 states, "In light hazard occupancies, privacy curtains that are supported by fabric mesh on ceiling track and have openings in the mesh equal to 70 percent or greater and extend a minimum of 22 in. (559 mm) from ceiling shall not be considered obstructions…" This section applies to standard pendent and upright spray sprinklers.

The same requirements are specified for:

- Standard sidewall spray sprinklers (section 8.7.5.2.2.1)
- Extended coverage upright and pendent spray sprinklers (section 8.8.5.2.2.1)
- Extended coverage sidewall spray sprinklers (section 8.9.5.2.2.1)

It is my understanding that the change in wording regarding how to measure the vertical distance was to make it easier for users to measure the distance. Please confirm that in light hazard occupancies, privacy curtains that are supported by fabric mesh on ceiling track and have openings in the mesh equal to 70 percent or greater and extend a minimum of 18 inches from the sprinkler deflector shall not be considered obstructions and do not have to be replaced.

**Answer:** Curtains that are at least 70% open and are at least 18 inches below the sprinkler deflectors are not obstructions to the sprinkler spray pattern. With the 70% open mesh, sufficient water should be able to get through the mesh to control a fire.

The section that you have referenced from the 2007 edition of the standard is a subsection of 8.6.5.2, which only applies when the obstruction is within 18 inches of the sprinkler deflector. In that case, we need to be concerned. Section 8.6.5.2.2.1 was added to the standard after testing (by NIST) showed that the solid portion of the curtain could be within 18 inches of the sprinkler deflector, but that sufficient water would still get through the curtain mesh at the top if there was a space of 22 inches of open (more than 70%) mesh from the ceiling.

There was no intent on the committee's part to cause any wholesale change in the mesh curtains that have been used for years.

**Question 10 – NFPA 13R**

NFPA 13R, 2007 edition (Obstructions to Residential Sprinklers, Section 6.8.1.5.3.1) states, "In all closets, including those closets housing mechanical equipment, that are not larger than 400 $ft^3$ in size, a single sprinkler at the highest ceiling space in the closet shall be sufficient without regard to obstructions."

Does the above excerpt reference both pendent and horizontal sprinklers? It is noted that the sprinkler must be at the highest ceiling space in the closet, which could lead someone to believe the reference is only for a pendent sprinkler. A local AHJ is concerned that a sidewall sprinkler's water distribution pattern can be obstructed by storage on the shelving of a closet and that storage may affect the response time by blocking the heat from getting to the sprinkler. A.6.8.1.5.3 notes, "Where the obstruction criteria established by this standard are followed, sprinkler spray patterns will not necessarily get water to every square foot of space within a room." In my opinion, this statement addresses the intention of this code, but clarification on the above excerpt would be much appreciated.

**Answer:** Yes, section 6.8.1.5.3.1 in the new 2007 edition of NFPA 13R applies to both pendent and sidewall sprinklers. The structure of section 6.8.1.5.3 was intentionally designed to have 6.8.1.5.3.1 apply to all situations, section 6.8.1.5.3.2 apply to pendent sprinklers, and section 6.8.1.5.3.3 apply to sidewall sprinklers. If the committee had intended the closet rules to only apply to pendent sprinklers, they would have put them in section 6.8.1.5.3.2 rather than making them their own section.

The committee had a special task group on obstructions to residential sprinklers that worked for three years running hundreds of different tests and computer fire models. The task group concluded that obstructions in very small compartments have no effect on sprinkler response. The heat from a fire moves so fast and bounces off all of the surfaces so that the heat reaches the sprinkler from multiple angles. Regardless of where the sprinkler is in relation to the obstruction, heat from a fire in a small closet will quickly activate any sprinkler, pendent or sidewall, provided the sprinkler is near the top of the compartment. Once the sprinkler has activated, water will also flood the space, bouncing off of obstructions and walls and absorbing heat from the fire in the space. Even without direct water spray, the deluge of water discharging from a sprinkler in a small closet should be able to control a fire in that closet, regardless of obstructions near the sprinkler. At a minimum of 7 psi, even a small orifice residential sprinkler will discharge 13 gpm. With a typical 8 ft ceiling, a 400 cubic foot closet will have a floor area of only 50 sq ft., resulting in a density of 0.26 gpm per sq ft, well above the 0.05 gpm per sq ft required as a minimum density for NFPA 13R applications.

**Question 11 – Atmospheric Pressure for Pumps**

My staff has been discussing utilizing atmospheric pressure within a non-pressurized water storage tank that could augment the pressure available for the suction of a fire pump. I don't believe it is reasonable to use this +14 lbs, but I am not positive. Do you have any advice on this topic? Or is this just basic physics 101?

**Answer:** In effect, NFPA 20 already allows you to take advantage of atmospheric pressure for a fire pump being fed from a tank. Section 5.14.3.2 allows you to get down to a gage pressure of -3 psig when taking suction from a tank on the same elevation as the pump. When the tank is almost

empty and the water level is near the same elevation as the pump, there is no elevation head pushing water into the tank. But atmospheric pressure will still get the water there, even with friction loss in the pipe.

That is all we are allowed to use atmospheric pressure to do. Otherwise, section 5.14.3.1 requires that we use some additional pressure to get the water to the pump suction flange.

**Question 12 – ESFR Minimum Calculation Area**

NFPA 13 (2007 edition) states the following for ESFR sprinklers in Section 8.12.2.3: "The minimum allowable protection area of coverage for a sprinkler (As) shall not be less than 64 square feet." However, Section 22.4.4.3.1 states, "For ESFR sprinklers, the design area shall consist of the most hydraulically demanding area of 12 sprinklers, consisting of four sprinklers on each of three branch lines, unless other specific numbers of design sprinklers are requesting in other sections of this standard. The final design shall include a minimum of 960 square feet." The minimum coverage area for 12 sprinklers based on the minimum per sprinkler would be 768 square feet (12x64=768 square feet), which is less than the required 960 square feet reference in chapter 22. In the scenario in which all the sprinklers in the remote area are spaced at 64 square feet, it would seem that 15 ESFR sprinklers would need to be included in the calculation area (960/64=15 sprinklers). Why was the minimum protection area per sprinkler reduced to 64 square feet if the minimum design area of 960 square feet stayed the same? The situation noted above is rare, but there are more typical situations in which the 12 remote sprinklers cover an area less than 960 square feet. Please clarify.

**Answer:** You are correct that the 2007 edition would require 15 sprinklers in the design area instead of 12 if the sprinklers are all on 64 sq ft spacing. The two different rules cover different concerns. The minimum area is related to the concern of getting one sprinkler wet with the spray from another sprinkler. Years ago, the rules were set at a minimum of 8 ft between sprinklers and a minimum of 80 sq ft per sprinkler based on the distribution of water from the sprinkler and an analysis of how that would effect the opening pattern of the sprinklers during a fire given different possible locations for the origin of the fire below the sprinklers. At that time, Factory Mutual felt that the minimum 8 ft per sprinkler was not sufficient and wanted the sprinklers spread out a little more so that the second sprinkler in at least one direction was not as close and would have a chance of opening without being sprayed by water from the sprinkler next to it. Years later, additional work showed that this concern was not as important as was first thought, so the minimum was recommended to be changed from 8 ft in one direction to 8 ft in both directions (8 x 8 being 64 sq ft).

The design area has to do with how many sprinklers will open during a fire, taking into account the fact that for some reason the first sprinklers might not be able to suppress the fire. The heat released from a fire will spread out over a certain area at the ceiling and open sprinklers more remote from a fire. The original work with ESFR sprinklers led to a design area of 960 sq ft (12 x 80 sq ft), and the NFPA committee has not seen any data that would lead them to the conclusion that a smaller design area would be sufficient if the sprinklers were closer together. There may be such data in existence (since FM has not moved to a minimum design area in their standards) but the data has not been shared with the NFPA sprinkler committee. Therefore, the committee wants to be conservative and continue to enforce the minimum 960 sq ft design area until they see more data on the heat release from a fire and the opening pattern of the sprinklers.

## Upcoming NFSA "Technical Tuesday" Online Seminar – June 12th

**Topic: Changes to the Pump Requirements**
**Instructor: Kenneth E. Isman, P.E., NFSA Vice President of Engineering**
**Date: June 12, 2007**

Along with the other standards, NFPA 20 has also undergone a revision for 2007. This seminar will discuss the major changes in this new edition including the use of the term "alarm" throughout the standard and the new definition for "reliable" power supplies so that it is more clear when an electric motor driven fire pump can be installed without back-up power.

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 "Business Thursday" Online Seminar – June 21st

**Topic: Tort Law Reform**
**Instructor: Buddy Dewar, NFSA Director of Regional Operations**
**Date: June 21, 2007**

Tort law reform has been taking place in some areas of the country and these areas have experienced above-average economic growth. Coincidence? There are many areas in the U.S. unfriendly to the business environment of a fire sprinkler contractor. This seminar defines a "tort" with regard to fire protection law, describes how it may be dangerous to business and local economics, and reviews examples of successful reform.

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

## Sign Up Now for July-December 2007 "Technical Tuesday" Seminars

Registration is under way for the series of ten "Technical Tuesday" online classes for the second half of 2007. As in the past, a discount of 30 percent is available when signing up for all ten seminars in the series:

| Date | Topic | Instructor |
|---|---|---|
| July 17 | Multipurpose Piping Systems | Russell P. Fleming, P.E. |
| Aug 7 | Flammable and Combustible Liquids – Part 1 | Victoria B. Valentine, P.E. |
| Aug 21 | Concealed Space Area Calculations | Cecil Bilbo, Jr. |
| Sept 11 | Smoke and Heat Vents | Michael Friedman, P.E. |
| Sept 25 | Cloud Ceilings | Kenneth E. Isman, P.E. |
| Oct 9 | Special Considerations for Dry Systems | Cecil Bilbo, Jr. |
| Oct 23 | Flammable and Combustible Liquids – Part 2 | Victoria B. Valentine, P.E. |
| Nov 6 | Spec Buildings | Kenneth E. Isman, P.E. |
| Nov 20 | NFPA 25 – 2007 Update | Russell P. Fleming, P.E. |

Register at www.nfsa.org or call Dawn Fitzmaurice at 845-878-4200 ext. 133.

The following are the descriptions for each class:

July 17, 2007 – **Multi-Purpose Piping Systems –** Russell P. Fleming, P.E, Executive Vice President – Basic/Intermediate

NFPA 13 specifically recognizes the use of sprinkler systems with non-fire protection connections, and NFPA 13D and NFPA 13R also contemplate some types of combined piping systems. This seminar will provide a historical review of combination system concepts, review the current applicable rules of the NFPA standards, and discuss the potential impacts of their use. Do these systems simply represent an available alternative or are they the future of the fire sprinkler industry?

August 7, 2007 – **Flammable and Combustible Liquids – Part 1** – Victoria B. Valentine, P.E., Manager of Product Standards – Basic/Intermediate

Flammable and combustible liquids offer a challenge to many fire protection systems. The amount of liquids and the storage arrangement can affect the ability of a fire to be controlled. NFPA 30, Flammable and Combustible Liquids Code, offers some guidelines on how to protect specific arrangements. This seminar will review the different types of systems that can be used to protect these hazardous liquids and some scenarios that fall outside the scope of the standardized protection schemes.

August 21, 2007 – **Concealed Space Area Calculations –** Cecil Bilbo, Jr., Director of Technical Services – Basic/Intermediate

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.

September 11, 2007 – **Smoke Vents, Heat Vents, and Draft Curtains –** Michael J. Friedman, P.E., NFSA Consultant – Intermediate

While not the primary function of a sprinkler design technician, the effect of smoke vents, heat vents, and draft curtains on sprinkler performance is critical to proper sprinkler placement and integration of venting systems. This seminar will provide information a technician needs to know and the effect on sprinkler layout.

September 25, 2007 – **Cloud Ceilings** – Kenneth E. Isman, P.E, Vice President of Engineering – Intermediate

They have been called “Cloud Ceilings”, “Non-continuous Ceilings” and even “Islands in the Sky” by architects. These architectural features can be described as any ceiling that is not continuous across an entire room or space creating multiple objects in between the observer on the floor and the eventual roof of the room or space. As far as fire sprinklers are concerned, the

issues are whether to sprinkler above or below these features (or both). This seminar will address all of the relevant concerns of matching a sprinkler system to a variety of different architectural features that have the potential to block hot gasses from getting to sprinklers and the potential to block discharge from the sprinklers from getting to the floor below.

October 9, 2007 – **Special Considerations for Dry Systems** – Cecil Bilbo, Jr., Director of Technical Services – Intermediate

This seminar will discuss the special requirements that are often overlooked on dry systems. The discussion will include the calculation of water delivery times and the new manifolds for testing systems in this manner, as well as the new requirements for signs and information on a dry sprinkler system. Also, find out if the small room rule and the largest room method can be used on dry systems. More importantly, the TIA recently issued for dry systems and its affect on the development of the 2007 edition of NFPA 13 will be discussed. In addition, this seminar will take a look at the history of the requirements for water delivery in NFPA 13 over the last hundred years.

October 23, 2007 – **Flammable and Combustible Liquids – Part 2** – Victoria B. Valentine, P.E., Manager of Product Standards – Intermediate

Automatic fire protection for inside storage of flammable and combustible liquids is one of the most common topics that sprinkler contractors have to deal with in NFPA 30. There are many protection schemes that are laid out for the users based on testing data. This seminar will focus on the different arrangements of inside storage and the options put forth by NFPA 30 including the flow charts used for determining protection. In addition, where in-rack protection is needed the schemes will be reviewed.

November 6, 2007 – **Spec Buildings** – Kenneth E. Isman, P.E., Vice President of Engineering – Intermediate

A fundamental assumption of NFPA 13 is that the sprinkler system is designed to match the use of the building. But what do sprinkler contractors do if the use of the building has not been established by the owner? What if the owner does not know how the building is going to be used and is just putting up the building in the hopes that someone else will buy or lease it? This seminar will provide strategies that sprinkler contractors can use to adequately protect these buildings that are being constructed without specific uses in mind.

November 20, 2007 – **NFPA 25 Update** – Russell P. Fleming, P.E., Executive Vice President – Basic/Intermediate

The 2008 edition of NFPA 25, presented at the June 2007 NFPA conference, includes new responsibilities for system inspectors. Among other items, the committee has been concerned about the lack of signage and the need for an air pressure integrity test for dry pipe systems. The committee has also attempted to address long-standing gray areas such as the degree to which a water supply can deteriorate before an investigation of adequacy is warranted, and the tests needed following component replacement or repair. Even in areas where older editions of NFPA 25 are enforced, the new provisions represent the state of the art that can impact the liability of companies performing inspection, testing and maintenance.

December 11, 2007 – **Special Storage Sprinkler Systems -** Cecil Bilbo, Jr., Director of Technical Services – Intermediate/Advanced

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.

## Additional NFSA Training Opportunities

### Two-Week Technician Training Seminar

*September 24- October 5* *Kansas City, MO*

This seminar, the last available for 2007, also serve as a starting point for the NFSA's two-year Certificate Program for Fire Sprinkler Technicians. For more information, contact Nicole Sprague at 845-878-4200 ext. 149 or email: Sprague@nfsa.org.

### 3-day Advanced Technician Training Classes

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| *July 24-26* | *Chicago, IL* |
| *September 5-7* | *St Louis, MO* |

For more information, contact Nicole Sprague at 845-878-4200 ext. 149 or email: Sprague@nfsa.org.

### NICET Inspector Certification Review Classes

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| *June 19-21* | *Wilmington, DE* |
| *August 14-16* | *San Antonio, TX* |
| *November 6-8* | *Providence, RI* |

For more information, 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:

June 5 Hydraulics for Fire Protection////Albany, NY
June 6 NFPA 13 2002 Update////Albany, NY

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| June 7 | Pumps for Fire Protection////Albany, NY |
| June 12-13 | Two-day NFPA 13 Overview & Intro to Plan Review////Holland, MI |
| June 14 | Hydraulics for Fire Protection////Holland, MI |
| July 31 | Introduction to Sprinkler Systems (1/2 day)(AM)////Pataskala, OH |
| July 31 | Underground Piping (1/2 day) (PM)////Pataskala, OH |
| Aug 1 | Pumps for Fire Protection////Pataskala, OH |
| Aug 2 | Sprinkler Protection for Rack Storage////Pataskala, OH |
| Aug 14-15 | Two-day NFPA 13 Overview & Intro to Plan Review////Centerville, OH |
| Aug 16 | Hydraulics for Fire Protection////Centerville, OH |

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



*In the promotion of the fire sprinkler concept, the National Fire Sprinkler Association represents all fire sprinkler industry interests including fire sprinkler contractors, manufacturers and suppliers of fire sprinklers and related equipment and fire protection professionals. Established in 1905, the National Fire Sprinkler Association provides publications, nationally accredited seminars, representation in codes and standards-making, market development, labor relations and other services to its membership. Headquartered in Patterson, New York, the National Fire Sprinkler Association has regional operations offices throughout the country.*