NFSA
The Voice of the Fire Sprinkler Industry

Tuesday e-Tech Alert

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Editor – Russell P. Fleming, P.E.

Best Questions of June 2009

We have selected the following questions as the "Best of June 2009" answered by the engineering staff as part of the NFSA's EOD member assistance program:

Question 1 – Five-Year Flow Testing of Multiple Standpipes

We are currently attempting to come up with a standardized test procedure for the 5-year flow testing of Class I automatic standpipe systems. NFPA 25, 2008 edition, Section 6.3.1.1 is ambiguous as to what actually constitutes an acceptable test of an automatic Class I standpipe.

Another association recently issued a bulletin indicating that there need to be two different flow tests of standpipe systems to demonstrate compliance with NFPA 25. This includes one at the highest elevation at which the maximum numbers of standpipes are present so as to be able to show that the water supply is capable of meeting the standpipe demand. Are you in agreement that NFPA 25 requires this test of water supply every five years for automatic standpipe systems? If not, what should constitute a correct standpipe test in compliance with NFPA 25?

Answer: While we would agree that the wording of Section 6.3.1.1 is vague, we do not agree that the standard requires the simultaneous flowing of multiple standpipes so as to be able to test the water supply. We addressed the issue of NFPA 25 requirements for testing of standpipe systems in an issue of e-TechAlert (No. 142) published on March 17, 2009.

Section 6.3.1 in NFPA 25 covers flow testing of standpipe systems. The Committee wants to make sure that there is sufficient pressure for the hose connections on the standpipes, which is the reason behind the test. Section 6.3.1.3 states, "All systems shall be flow tested and pressure tested at the requirements for the design criteria in effect at the time of the installation." But in order to understand the meaning of this section it is necessary to review the Committee actions on past public proposals and comments.

When the 1998 edition of NFPA 25 was being prepared, a proposal was submitted to clarify this section (25-17), which is when the concept of design pressure was introduced. The annex language discussing that this test is typically done at a roof manifold or top of a stair leading to the roof was added in a comment (25-29) for that same edition. However, the Committee intent is apparent from its statement on proposal 25-42 during the preparation of the 2002 edition. This proposal resulted in the addition of the word "automatic" to clarify that only systems with an automatic water supply had to be subjected to the flow test. In its statement, the Committee described its pass/fail criteria with the phrase "…one considers 500 gpm at 65 psi as the test criteria…" This indicates the Committee's desire to test to the criteria expected for the hydraulically most remote standpipe and

not the complete system demand. Finally, in the preparation for the 2008 edition of NFPA 25, the Committee accepted a proposal in principle (25-89), replacing the term "system demand" with "design criteria". Again, this shows that the design criteria for the most remote standpipe should be used and not the total system demand for the flow test.

NFSA will suggest the Committee further clarify its intent in future editions of NFPA 25.

Question 2 – Hand Grenade Manufacturing and Storage

The following is our interpretation on protecting a grenade manufacturing floor area at an army ammunitions plant. Can the building floor storage area be protected with 0.2 gpm/sq ft over 3000 sq ft with the below assumptions and code interpretations?

- Per UFC 3-600-01 Section 6-10.1, the ammunition processing area will be protected in accordance with Army AR 385-64, U.S Army Explosives Safety Program; Army Pamphlet 385-64, U.S. Army Ammunition and Explosives Safety Standards.

- Per Army Pamphlet 385-64 par. 3-20, an automatic sprinkler system shall be provided in accordance with NFPA for explosive manufacturing facilities.

- Per NFPA 495 2006 – Explosive Materials Code Section 14.3.9(4)(h) the building shall be protected in accordance with NFPA 13.

- Per NFPA 13 (2007) Table A.5.6.3, "Ammunition" shall be classified as a Class IV commodity.

- The assumption is made that where the ammunition is processed it will be locally protected by an ultra high-speed deluge system in accordance with UFC 3-600-01 Section 6-10.1.1.1. The remainder of the floor area will house and store raw materials and finished product. These commodities will consist of product in cardboard boxes, bins, and barrels on wood pallets. The product will not be stacked in excess of 12 ft.

- Per NFPA 13 (2007) Table 13.2.1 a Class IV commodity shall be protected as Ordinary Hazard Group II where it does not exceed 12 feet in storage height.

- Per UFC 3-600-01 Table 4-1, Ordinary Hazard Group II shall be 0.20 gpm per sq ft over 3000 sq ft with an exterior hose demand of 500 gpm for 90 minutes. This is the worst-case hazard for this facility on which the calculations are based.

Answer: Sorry, but we are not in a position to comment on the proposed discharge criteria for any specific project, since in some states this would constitute the practice of engineering. We can comment that the inclusion of "ammunition" as a Class IV commodity in Tables A.5.6.3 and A.5.6.3.4 of NFPA 13 is intended to be for small arms such as shotgun shells and handgun bullets. It should also be pointed out that the material in these tables is for storage of a finished product in cartons and, at the least, information would be needed as to whether the storage of grenades could be considered to burn the same. We suspect it would be considered more hazardous. The storage of raw materials might be a completely different hazard classification based on the quantity of the material and how it is packaged. Finally, however, we would suggest this is a variation on the old saying "Almost only counts in horseshoes and hand grenades". If the sprinkler system "almost" responds in time to prevent detonation of a single hand grenade, the hand grenade wins.

Question 3 – Protection of Combustible Concealed Space by Attic Sprinklers

My question is on combustible concealed spaces. We have a situation where we have a 32-inch deep wooden bar joist with roof trusses bearing on top. There is unfaced fiberglass insulation in between the roof trusses, on top of the bar joists. The bar joist cavity is a heated space but the roof truss space is unheated. There is a wet pipe system running through the 32-inch bar joist space protecting the area below the ceiling, which is attached to the underside of the bar joists, and a dry system protecting the roof truss attic space above the insulation. The question is this: Are additional sprinklers required for protection of the 32-inch combustible bar joist space, in light of the insulation barrier? Or is this space considered protected by the attic system?

Answer: If we understand you correctly, if you were within the space in question you could look up and see insulation, you could look down and see the attached ceiling, and you could look to the sides and see combustible bar joists with sprinkler piping running through, but with the sprinklers located below the ceiling. Per NFPA 13, you need sprinklers for that space unless you can comply with one of the exceptions in Section 8.15.1.2. It should be noted that, in the 2007 edition of the standard, a new section was added as follows:

> 8.15.1.2.16* Concealed spaces formed by noncombustible or limited combustible ceilings suspended from the bottom of wood joists, composite wood joists, wood bar joists, or wood trusses that have insulation filling all of the gaps between the bottom of the trusses or joists, and where sprinklers are present in the space above the insulation within the trusses or joists, shall not require sprinkler protection. The heat content of the facing, substrate, and support of the insulation material shall not exceed 1000 Btu/ft^2 (11,356 kJ/m^2).

Although this might appear to address your situation, the conditions are different. In the wording of the new section, the only visible combustibles in the space under consideration are the undersides of the lower chords of the combustible bar joists or trusses, and insulation fills the gaps between those chord faces. In your situation, you have the full depth of the combustible bar joists within the space. Unless you fall under one of the other conditions specifically allowing omission of sprinklers, such as filling the space entirely with noncombustible insulation, then sprinklers are required in the bar joist space.

Question 4 – Pump Back-up Power Arrangements

We have a school with a questionable back-up power supply. There are two generators with a transfer switch. The fire pump feed is off of the generator transfer switch. Is this allowed, and does the pump transfer switch need to start the generator? I am not sure it does under the current configuration.

Answer: These questions may be better asked of the transfer switch manufacturer, because they may have an opinion about the use of their specific product, but we can address the questions in terms of the NFPA standards. As to whether there can be a transfer switch for the generators that then is connected to the transfer switch for the pump controller, the answer is a qualified “yes”. Essentially, this would be similar to Figure A.10.8 in NFPA 20 (Arrangement II) with the alternate source indicated in the top right corner of the figure connected to a transfer switch that controls from which generator the alternate source current is coming. This is permitted by NFPA 20 because there has to be a transfer switch between generators. You can’t have a situation where both generators are running and providing power to the energized alternate source. However, this answer is “qualified” because we are concerned with the performance requirements of NFPA 20 and the delays that might occur from multiple transfer switches taking their time to do their job. There are delays that are permitted by NFPA 20 to handle different real world problems, but compounding these delays with additional transfer switches might be a problem. Section 10.8.3.12 of NFPA 20 allows a delay in starting an alternate source generator. There is no specific time period, it is simply hoped the delay will be reasonable. But with multiple generators, you don’t

want to compound long delays. You would need to shorten the duration of at least one of the delays to still provide power to the pump in a reasonable period of time. You may need to work with the manufacturer of the transfer switches to determine what additional considerations they have with your specific arrangement.

Your second question is whether or not the transfer switch is required to start the generator. Most of the time, we don't need to address this issue in fire protection. Generators are installed in buildings for many reasons that have nothing to do with fire protection (heat, light, water), so the generator starts whenever there is a power outage, regardless if there is a need for fire protection at that moment. We can appreciate the argument that a generator that is only feeding a fire pump might not need to start immediately upon loss of power. In the majority of instances that the power goes out in buildings, there is no fire. So, the argument could be made that a generator that only serves a fire pump should only have to start if there is a fire protection demand (like a loss of water pressure in the fire protection system) during a power outage. However, this argument assumes that the controller and transfer switch have their own source of back-up power (like batteries) that will survive the duration of the power outage and call for the generator to start if needed. Section 10.8.3.6.2 of NFPA 20 does require the transfer switch to start the generator under low voltage or no voltage situations. But Section 10.8.3.6.5 states that Section 10.8.3.6.2 does not apply where the transfer switch is upstream of the controller circuit breaker. We don't think the committee intended for this loophole to say that generators don't have to start on loss of power, but that is the end result of what the committee did as they were trying to address a more complex issue of where the power is monitored in order to make this transfer of power. So, in summary, it would appear that NFPA 20 allows the transfer switch to be arranged so that it does not automatically start the generator upon loss of power. However, the generator would need to be set to start on both the loss of power and a signal from the fire protection system, and all devices responsible for receiving and interpreting that signal from the fire protection system would have to have their own sources of back-up power including the alarm/detection system, the fire pump controller and the transfer switch(es).

Question 5 – Hose and Pipe Thread Designations

What is the difference between NH and NST thread dimensions? Can the terms be used interchangeably?

Answer: NH stands for National Hose thread, developed as a standardized thread for joining hose or for attaching hose to a pipe as with a fire department connection or a standpipe connection. NST stands for National Standard Thread, developed for use in pipe joining. Both NH and NST have exactly the same measurements and dimensions. They are completely compatible with each other. If you have a pressure gauge (for example) with NST threads, it can be screwed onto the end of any hose with NH threads or any outlet with NST threads. But to be completely and technically accurate, NST should be used when discussing the joining of pipe and NH should be used when discussing an outlet for a hose connection.

The pipe threads typically used for joining steel pipe in sprinkler systems are not NST, however, but National Pipe Tapered thread, or NPT. By way of comparison, an NPT for 1-inch steel pipe has 11.5 threads per inch, but only 8 threads per inch with the NH/NST schedule.

Question 6 – Multiple Hazards and Combined NFPA 13 and 13R Systems

Is there anything in the codes that would require a mixed occupancy to be protected by separate sprinkler zones or separate sprinkler systems altogether? What we have is a building that has 13R in some wings connected by a "commons" area which was specified as an NFPA 13 area and separated by 2-hour fire walls from the wings with protected openings. An official is telling us they need to be protected by different zones or systems. I cannot recall anything in the codes that would require these areas to be protected by different zones. What is your take on the situation?

Answer: NFPA 13 specifically permits a single system to protect multiple hazards. You can see this in sections like the occupancy hazard definitions of Chapter 5 where the occupancy classifications are allowed to be for a "portion of an occupancy", meaning that multiple occupancies can be in the same building. Other sections that also talk about a single system protecting multiple hazards include sections 11.1.2, 12.3 and 12.7.2. In the 2007 edition of NFPA 13, the committee clarified the subject even more when they stated that a single sprinkler system is permitted to serve multiple buildings, as long as the buildings had some component in common (like a wall, roof, breezeway, etc.). This can be found in Section 8.2.4. Even completely separate buildings (with completely separate hazards) can be protected with a single sprinkler system if the AHJ can be convinced that the occupants of the second building will have access to control equipment in the first building (see Section 8.2.5). In summary, there is nothing in NFPA 13 that requires completely different systems for different buildings or different hazards within buildings. Since NFPA 13R is silent on the issue, the intent is to refer back to NFPA 13 for such issues outside of the dwelling units.

However, this is not the same question as to whether a system can be both an NFPA 13 system and an NFPA 13R system. It cannot, since the level of protection of the two systems is different, and a vulnerability of an NFPA 13R system could theoretically compromise an adjacent NFPA 13 system. You describe your building in a way that suggests it could be protected with an NFPA 13R system, with the commons area considered an area outside the dwelling unit and protected using design criteria from NFPA 13. If, however, the commons area is definitely specified as a full NFPA 13 sprinkler system, it cannot be part of the NFPA 13R system. The option also exists to protect the building with an NFPA 13 system, using residential sprinklers in the wings under the NFPA 13 criteria, but this obviously could affect the need for sprinklers in combustible concealed spaces.

Question 7 – What Does "Adjacent" Mean?

NFPA 13 (2007 edition) Section 11.2.3.1.4(3) talks about applying a 3000 sq ft design area for areas that are adjacent to the qualifying (unsprinklered) combustible concealed space. If the second floor of a three-story building has a qualifying combustible concealed space that requires 3000 sq ft, do I also have to design for a 3000 sq ft area on the third floor if the third floor does not have a qualifying combustible concealed space? In other words, is the third floor "adjacent" to the second floor?

Answer: The Committee has never defined the word "adjacent". The reason this rule exists is out of concern for a fire emerging from a nonsprinklered combustible space and challenging sprinklers over a larger area than normal. The Committee added the word "adjacent" because they did not want to penalize the sprinkler system on the 15th floor for a nonsprinklered concealed space on the second floor. Without any specific definition for "adjacent" we have to fall back on the dictionary definitions, which include "contiguous" or "adjoining". Since the sprinklers on the third story protect the floor of the third story, the 3000 sq ft requirement would apply to the sprinklers on the third story if the combustible concealed space touched the floor of the third story. If the combustible concealed space is the floor/ceiling assembly, then the assembly does touch the third floor and a 3000 sq ft design area should be provided for the sprinklers protecting the third floor. If the concealed space is on a portion of the second floor that is not covered by the third floor, or for some reason is separated from the floor of the third story by sufficient fire resistive construction to allow it to be considered a separate building as determined by the building code, then the third story sprinkler area would not be considered adjacent and the 3000 sq ft rule would not apply to the sprinklers protecting the third story.

Question 8 – Use of Listed Expansion Chambers

NFPA 13 (2007 edition) Section 7.6.3.3 states: "Where the connection between the antifreeze solution and the wet pipe system incorporates a backflow prevention device, and the conditions of 7.6.3.4. are not met, a listed

expansion chamber of appropriate size and precharged air pressure shall be provided to compensate for thermal expansion of the antifreeze solution as illustrated in Figure 7.6.3.2". Does the expansion chamber tank have to be listed for fire protection use or for the specific antifreeze solution? There are very few expansion tanks listed for fire protection and they are very costly and different from standard expansion tanks.

Answer: Yes, the expansion chamber needs to be listed for fire protection. You are correct that there are few manufacturers and that they seem expensive. The reason that the Committee wants the chamber to be listed for fire protection is that the bladder inside can be fragile. If the bladder fails, the tank won't work properly. Unlisted tanks typically are only rated for 80 psi and will not stand up to the pressures expected in sprinkler systems.

Question 9 – Clearances from Other Mechanical Equipment

Is there somewhere in NFPA 13 (2007 edition) that states a particular clearance around or from the work of other mechanical, electrical or plumbing (MEP) trades, or is there such a reference in the building codes? I have a particular project and the contractor is asking for an allowable tolerance, asking to see it somewhere in a particular standard or code. I can't find any set clearance around MEP trades' equipment in regard to fire sprinkler pipe or hangers. Can you help steer me in the right direction of where this information might be located?

Answer: While NFPA 13 addresses clearances from structural members and through walls and floors in its seismic requirements, we are not aware of any code or standard that contains specific minimum clearance requirements for sprinkler pipe or hangers from other mechanical equipment. There are sections of NFPA 70 that require certain clearances for electrical components. There are also sections of NFPA 13 that require de facto clearances for the sprinklers themselves, i.e. the obstruction rules. But none of these rules apply to sprinkler pipe, hangers or braces. Prior to the 2007 edition of NFPA 13, restraint of branch lines was required where upward or lateral movement could result in an impact against the building structure, equipment, or finish materials. Such restraint is now required for all branch lines in areas where the earthquake protection criteria is applied, and it is presumed that the equipment of other trades is likewise restrained against impact on sprinkler systems. In general, common sense dictates some degree of clearance around pipe and fittings for all systems in order to accomplish maintenance and repairs. We have also seen the need to prevent inadvertent contact that could result in corrosion, inappropriate grounding, or, in the case of CPVC piping, the potential for environmental stress cracking (ESC) from contact with incompatible materials.

Question 10 – Residential Sprinklers in Areas Contiguous with Corridors

We are currently laying out a congregate living facility. In NFPA 13 (2002 edition) Section 8.4.5.1 it states: "Residential sprinklers shall be permitted in dwelling units and their adjoining corridors provided they are installed in conformance with their listing". We are proposing using residential sprinklers in the building. The corridors in the building follow the rule, but the corridors continue into other light hazard occupancies (i.e. living rooms, dining rooms, etc.). Our question is, are we allowed to continue utilizing residential sprinklers in these areas that are connected to the corridors? There are no doors or walls that separate these areas. These areas are all open to the corridor and there is no mixture of occupancies in the areas in question. Please let us know if these sprinklers are acceptable to use in our design.

Answer: No. The living rooms, dining rooms, etc. in your scenario are their own light hazard spaces and not part of the dwelling unit and therefore would need to be protected with quick response sprinklers or quick response extended coverage sprinklers. If the living rooms or dining rooms were part of the dwelling unit as in apartment

buildings or condominiums, then residential sprinklers could be used in those spaces because they would be considered part of the dwelling unit. A dining room serving multiple units is not part of a dwelling unit.

Question 11 – Room Integrity Testing with FM-200

We have a project in an existing building where we installed an FM-200 clean agent system in a small room with an acoustical tile ceiling. The room has been sealed as tightly as possible using dampers, caulking and sealants. The room however, can not be sealed tightly enough to maintain the required concentration for the required duration without the use of a plastic membrane and tape on the ceiling. We do not have a second door fan to pressurize the above ceiling space. In accordance with NFPA 2001 (2008 edition), we have several questions. Are all leaks in the enclosure required to be positively sealed? Is it acceptable to use a flexible membrane temporarily taped to the ceiling to eliminate the ceiling leakage factor when determining if the enclosure meets the requirements of NFPA 2001 for retention time? Finally, if the room passes the door fan / room integrity test with the temporary flexible membrane in place at the ceiling but not with it removed, does this constitute failure of the enclosure test?

Answer: Annex C of NFPA 2001 provides information on procedures for checking enclosure integrity. Section C.1.2.2 notes that "enclosures with large overhead leaks but no significant leaks in the floor slab and walls will yield unrealistically short retention time periods. However, in such cases the authority having jurisdiction might waive the quantitative results in favor of a detailed witnessed leak inspection of all floors and walls with a door fan and smoke pencil."

NFPA 2001 contains an Annex C.2.6.2 with an optional "Suspended Ceiling Leakage Neutralization Method" that states: "Where an unobstructed suspended ceiling exists, the leakage area below the ceiling can optionally be measured by neutralizing ceiling leaks. This method provides a more accurate estimate of leakage rates." The technique involves the use of two separate door fans or a multiple blower fan so as to pressurize the above-ceiling space. Since you have noted that a second fan is not available, we would point out that Section C.2.6.2.8 specifically allows an alternate method involving the use of a flexible membrane, such as polyethylene sheet and tape, to temporarily seal identifiable ceiling leaks, which could include the entire suspended ceiling lower surface. Below-ceiling leakage is then measured solely using door fans drawing from the lower part of the room.

The reason that passing the test with the temporary membrane in place for the suspended ceiling does not constitute failure of the enclosure in the normal arrangement is that the clean agents are heavier than air. When computer programs are used to predict leakage based on the results of the fan test, the software produces the worst case scenario in which 50% of the cracks or gaps in the test area are at a low level where heavier gas/air mixture will seep out, and 50% are at a high level where lighter air will enter to displace it. Having leakage only at the ceiling level is not considered a breech of room integrity. However, for purposes of estimating retention time, whatever leaks are found in the walls and floor with the temporary membrane in place should all be assumed to be gaps where the gas/air mixture will seep out, since the ceiling with the temporary membrane removed can be assumed to allow the corresponding make-up air.

Question 12 – Residential Sprinklers on Soffits with "Shelves"

We have a situation where we are protecting residential units with residential sidewalls in the face of a soffit, with a residential pendent below the soffit to provide additional coverage. There is a lighting feature that creates a "shelf" at the bottom of the soffit below the sidewall sprinkler, effectively bringing the soffit out further into the room. Would this arrangement be acceptable? If not, what would the maximum depth of the lighting feature

need to be to make this work? An obstruction directly below the sidewall sprinkler is not addressed in NFPA 13 or the NFPA's *Sprinkler Handbook*.

Answer: In general, your arrangement projects in a similar fashion to kitchen cabinets although shallower in depth. The sidewall sprinkler can usually still protect the space adequately even if there is an obstruction below it. We do recommend consulting the AHJ as each scenario has its own variations that need to be taken into account.

The maximum depth for a soffit supporting sidewall sprinklers without the requirement for additional sprinklers under the soffit is 8 inches. In this manner, the standards allow a small unsprinklered area where water is not applied directly to the floor surface due to the obstruction. In the case of a "shelf" adding depth to the soffit, sprinklers would be required when the total obstructed depth exceeds 8 inches. In your case, you are providing sprinkler protection under the soffit, so the arrangement should be acceptable.

New 50% "Business Thursday" Discounts Encourage ITM Training

As previously announced, the NFSA is coordinating its "Technical Tuesday" and "Business Thursday" seminars for the second half of 2009 to promote comprehensive training in the area of Inspection, Testing and Maintenance, helping individuals train for the work elements in the NICET Inspection and Testing certification program. Ten "Technical Tuesday" online training programs will be offered along with six "Business Thursday" online seminars. The seminars start at 10:30 am Eastern time (7:30 am Pacific time) and run from 60 minutes to 90 minutes in length, allowing participants to ask questions via e-mail. The seminars are priced at $125 each for NFSA members. While the usual 30 percent discount will be available for the package of ten "Technical Tuesday" seminars, and a similar 30 percent discount will be available for the package of six "Business Thursday seminars", the NFSA is also offering an unprecedented 50 percent discount for the six Business Thursday seminars to anyone who signs up for the ten Technical Tuesday seminars. That's a total of only $1250 for members for all 16 seminars, or about $78 each. Fees are per connection, so it doesn't matter how many students are actually sitting in at a location. The two seminar series dovetail to allow a comprehensive review of both technical and nontechnical topics in the same overall subject area, aimed at NICET Inspection and Testing certification.

NOTE: Although field personnel that might benefit from the training might not be available during hours of the original presentations, NFSA members are reminded that the seminars are accessible online for at least 24 hours following their original broadcast. Perhaps you should consider scheduling Wednesday/Friday training sessions for your personnel at your own company's convenience.

Upcoming "Technical Tuesday" Online Seminar – July 21st

Topic: System Terminology
Instructor: Victoria Valentine, P.E., NFSA Director of Product Standards
Date: July 21, 2009

One of the struggles to beginning in any industry is learning the terminology. This is no different for the sprinkler industry and those responsible for inspecting fire sprinkler systems. This program will review the components that make up the water-based fire protection systems. It will include basic definitions that are applied in inspections of systems as well as necessary forms and checklists. (Great study guide for NICET Work Elements 41001, 41002, 41003, and 41008)

Upcoming "Business Thursday" Online Seminar – July 30th

Topic: Business and Professional Communications
Instructor: Russell P. Fleming, P.E., NFSA Executive Vice President
Date: July 30, 2009

The ability to write clear sentences and paragraphs is considered essential to everyone working in the business world today. Use of proper punctuation, vocabulary, spelling and sentence structure is important for company image, which contributes to company success. This seminar will present the basics of proper written communication and will include a look at the most common mistakes, including some involving terminology specific to the fire sprinkler industry. (Great study guide for NICET Work Elements 41012 and 45008)

To register or for more information, contact Dawn Fitzmaurice at (845) 878-4207.

Additional training opportunities available through the NFSA engineering department include…

Two-Week Layout Technician Training

September 14-25, 2009	Baltimore, MD
October 12-23, 2009	Phoenix, AZ

Inspection and Testing for the Sprinkler Industry

July 21-23, 2009	St. Louis, MO
August 4-6 (rescheduled from June 16-18)	Leominster, MA
August 18-20, 2009	Wilmington, DE

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

In-Class Training Seminars

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

NFPA 13 Overview	New Lenox, IL	July 8-9
Fire Pumps for Fire Protection	Denver, CO	July 7
Fire Pump Layout & Sizing (1/2 Day)	Denver, CO	July 8
Underground Piping for Fire Protection (1/2 Day)	Denver, CO	July 8
Inspection, Testing & Maintenance	Denver, CO	July 9
CPVC Piping Installation Requirements (1/2 Day)	Denver, CO	July 21
Sprinkler Protection for Flammable & Combustible Liquids	Denver, CO	July 21
Residential Sprinklers: Homes to High Rise	Denver, CO	July 22
Sprinkler Protection for Dwellings	Denver, CO	July 23
Commissioning and Acceptance Testing (1/2 Day)	Apple Valley, CA	July 28
CPVC Piping Installation Requirements (1/2 Day)	Apple Valley, CA	July 28

Inspection, Testing & Maintenance	Apple Valley, CA	July 29
Sprinkler Protection for Rack Storage	Apple Valley, CA	July 30
Inspection, Testing & Maintenance	Lake Jackson, TX	Aug 4
Hydraulics for Fire Protection	Lake Jackson, TX	Aug 5
NFPA 13 2007 Update	Lake Jackson, TX	Aug 6
Residential Sprinklers: Homes to High Rise	Rogers, AR	Aug 11
Sprinklers for Dwellings	Rogers, AR	Aug 12
Sprinkler Prot. for Flam. & Comb. Liquid Storage (1/2 Day)	Rogers, AR	Aug 13
CPVC Piping (1/2 Day)	Rogers, AR	Aug 13
NFPA 13 Overview	Kahului, HI	Aug 12-23
Inspection, Testing & Maintenance	Kahului, HI	Aug 14
NFPA 13 Overview	Brighton, MI	Aug 19-20
Sprinklers for Dwellings	Brighton, MI	Aug 21
NFPA 13 Update 2007	Aurora, IL	Aug 26
NFPA 13 Overview	Aurora, IL	Aug 27-28
NFPA 13 2007 Update	Boardman, OR	Sept 1
Hydraulics for Fire Protection	Boardman, OR	Sept 2
Inspection, Testing & Maintenance	Boardman, OR	Sept 3
Introduction to Sprinkler Systems (1/2 Day AM)	Alexandria, MN	Sept 8
NFPA 13 2002 Update (1/2 Day PM)	Alexandria, MN	Sept 8
Plan Review Policies & Procedures	Alexandria, MN	Sept 9
Inspection, Testing & Maintenance	Alexandria, MN	Sept 10
Commissioning & Acceptance Testing (1/2 Day)	Seattle, WA	Sept 15
CPVC Piping (1/2 Day)	Seattle, WA	Sept 15
Hydraulics for Fire Protection	Seattle, WA	Sept 16
Standpipe Systems for Fire Protection (1/2 Day)	Seattle, WA	Sept 17
Fire Pump Layout & Sizing (1/2 Day)	Seattle, WA	Sept 17
NFPA 13 2007 Update	Dayton, OH	Sept 16
Sprinkles for Dwellings	Dayton, OH	Sept 17
CPVC Piping Installation Requirements (1/2 Day)	Dayton, OH	Sept 18
Commissioning and Acceptance Testing (1/2 Day)	Dayton, OH	Sept 18
NFPA 13, 13R, 13D 2007 Update	Anaheim, CA	Sept 22
Hydraulics for Fire Protection	Anaheim, CA	Sept 23
Underground Piping (1/2 Day)	Anaheim, CA	Sept 24
Basic Seismic (1/2 Day)	Anaheim, CA	Sept 24
Plan Review Policies & Procedures	Berlin, VT	Sept 22
Sprinkler Protection for Rack Storage	Berlin, VT	Sept 23
CPVC Piping (1/2 Day)	Berlin, VT	Sept 24
Basic Seismic (1/2 Day)	Berlin, VT	Sept 24
Inspection, Testing & Maintenance	Concord, NH	Oct 13
Residential Sprinklers: Homes to High Rise	Concord, NH	Oct 14
Sprinklers for Dwellings	Concord, NH	Oct 15
Underground Piping (1/2 Day)	Woodland, CA	Oct 20
Commissioning & Acceptance Testing (1/2 Day)	Woodland, CA	Oct 20
Sprinkler Protection for General Storage	Woodland, CA	Oct 21
Sprinkler Protection for Special Storage	Woodland, CA	Oct. 22
Pumps for Fire Protection	Edwardsville, IL	Oct 27
Sprinkler Protection for General Storage	Edwardsville, IL	Oct 28
Sprinkler Protection for Rack Storage	Edwardsville, IL	Oct 29
NFPA 13 Overview	Pembroke, MA	Oct 27-28
Plan Review Policies & Procedures	Pembroke, MA	Oct 29

Inspection, Testing & Maintenance	Irving, TX	Oct 27
Hydraulics for Fire Protection	Irving, TX	Oct 28
NFPA 13, 13R, 13D 2007 Update	Irving, TX	Oct 29

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.