



Tuesday E-Tech Alert

January 31, 2006

Fire Flow Requirements

An NFSA member proposing to install a sprinkler system was recently asked by an Authority Having Jurisdiction to express the sprinkler system water flow demand at a pressure of 20 psi. The AHJ was apparently attempting to determine the impact of the system on the fire flow capability for the area.

Fire and water departments often deal with fire flow available at a pressure such as 20 psi as a minimum drafting pressure. This is expected to provide a sufficient safety factor such that public mains will not be overdrafted, creating suction pressures and potential backsiphonage or physical damage to the public water supply system.

The NFSA responded by acknowledging that this is an unusual request, but that the flow of the sprinkler system could be approximated by calculating a "system k-factor" in much the same way that a branch line k-factor is developed when performing hydraulic calculations manually. Assuming the normal system residual pressure is higher than 20 psi, the calculated system flow at 20 psi will be less. As such, this information is of limited use. Many sprinkler systems will have no real performance capability at a lower pressure, which is a reason fire departments are expected to support sprinkler system pressures through the fire department connection.

The broader issue is the concern of the AHJ for the fire flow available for manual suppression efforts at the time the sprinkler system is operating. There should be a recognition that if the sprinkler system is working properly, the flow demand for manual operations will be drastically reduced or eliminated.

One source for information on fire flow demands available to the water authority is the American Water Works Association's manual M31 - *Distribution System Requirements for Fire Protection*. The manual references several of the methods by which fire flow demands can be calculated for properties, including the ISO method, the IIT Research Institute method and the Iowa State University method. For fully sprinklered properties, however, the manual notes that the NFPA 13 sprinkler demand including hose stream allowance is widely considered sufficient for the fire flow. This same philosophy is reflected in the ISO Fire Suppression Rating Schedule.

The International Fire Code (IFC) is not as generous, but a specific reduction is given for sprinklered buildings in Appendix B (2003 edition). This amounts to 50 percent in dwelling areas and for most NFPA 13 or 13R systems, but 75 percent for light hazard systems in noncombustible buildings. Where this type of reduction is given, it would be reasonable to exclude the hose stream allowance when considering the sprinkler demand.

The base fire flow demands (without sprinklers) of the IFC are given in Table B105.1 and, depending on the construction type and fire flow calculation area, range from 1500 gpm to 8,000 gpm. The fire flow calculation area is defined as the total area of all floor levels within exterior walls plus the horizontal projection areas of the roof. For fire resistive construction (Types IA and IB), the fire flow calculation area consists of the area of the three largest successive floors, except that a single floor is used for open parking garages. For one and two-family dwellings with fire flow calculation areas not exceeding 3600 sq. ft. the designated minimum fire flow is 1000 gpm.

Annex H in NFPA 1 – *Uniform Fire Code* contains similar provisions for base fire flow. A reduction in fire flow of up to 75 percent is permitted for sprinklered buildings, but not less than 1000 gpm. For buildings protected with quick response sprinklers the minimum is 600 gpm.

For both fire codes, these annex sections must be specifically adopted by the jurisdiction to be enforced. The annex sections in both fire codes also recommend fire flow requirements be reduced for rural and suburban areas without water supply systems. The International Fire Code specifically authorizes the fire code official to use NFPA 1142 – *Water Supplies for Suburban and Rural Fire Fighting*. Like the AWWA Manual M31, that standard (2001 edition) gives full credit to built-in protection:

“7.4.1 The authority having jurisdiction shall be permitted to waive the water supply required by this standard when a structure is protected by an automatic sprinkler system that fully meets the requirements of NFPA 13,...13D,...or 13R.”

NFPA 13 contains its own reduction in fire flow requirements for areas without public water supplies, found in Section 11.2.3.1.8(11) of the 2002 edition:

“Where pumps, gravity tanks, or pressure tanks supply sprinklers only, requirements for inside and outside hose need not be considered in determining the size of such pumps or tanks.”

In this manner, NFPA 13 avoids penalizing the owner of a building in a rural area. A sprinkler system can be installed without requiring the provision of fire flow that might not be required for a nonsprinklered building.

Upcoming NFSA Technical Tuesday Online Seminar

February 7, 2006 – Standard Spray Sidewalls – Kevin J. Kelly, P.E., Manager of Codes

The sidewall sprinkler provides some unique benefits in the layout of sprinkler systems. This seminar will review the history and development of the sidewall sprinkler as well as the current rules from NFPA 13 for proper location and positioning, including obstruction rules. This seminar will also cover additional uses, limitations and future developments for the standard spray sidewall sprinkler.

Information and registration for this seminar is available at www.nfsa.org.

Spring 2006 Onlines Announced

For the On Line Seminar Series in the first half of 2006, the NFSA has decided to focus on the devices on the system that discharge the water (sprinklers and nozzles). Over the course of 10 programs, the use of different kinds of sprinklers will be explored. Each program will take a slightly different slant, but each one will look at the situations unique to that kind of sprinkler. The programs will be:

Date	Topic	Instructor
Jan. 24	Standard Spray Upright and Pendent Sprinklers	Kenneth E. Isman, P.E.
Feb. 7	Standard Spray Sidewall Sprinklers	Kevin J. Kelly, P.E.
Feb. 21	Extended Coverage and Quick Response Sprinklers	Kenneth E. Isman, P.E.
Mar. 7	Residential Sprinklers	Victoria B. Valentine, P.E.
Mar. 21	ESFR, Large Drop and Specific Application Sprinklers	Kevin J. Kelly, P.E.
Apr. 4	Dry Sprinklers	Russell P. Fleming, P.E.
Apr. 18	Special Sprinklers	Cecil Bilbo, Jr.
May 9	Sprinkler Aesthetics and Protective Coverings	Russell P. Fleming, P.E.

May 23	Spray Nozzles and Directional Sprinklers	Cecil Bilbo, Jr.
June 13	Water Mist Nozzles	Victoria B. Valentine, P.E.

The level of all seminar topics is considered intermediate. Because these seminars are being offered as a complete program on NFPA 13, a 30% discount is available when signing up for all ten seminars in the series.

To register visit www.nfsa.org.

Are You Aware of CPFST?

There are more than a hundred students currently enrolled in the NFSA's Certificate Program for Fire Sprinkler Technicians (CPFST). This 2-year program, initiated in 2004, has become the industry standard for technician training. It starts with the NFSA's two-week basic technician training seminar, and continues with a planned sequence of proctored on-the-job training, online training, chat rooms, and advanced training. The program includes periodic testing to monitor progress, and a certificate is awarded to recognize successful completion of the program. There are two "entry points" to the program each year, with the next entry point coming up in February/March of 2006. More information is available at the NFSA website or by contacting Ken Isman (isman@nfsa.org.)

2006 Basic and Advanced Technician Training, NICET Inspection Seminars

The NFSA is the only organization that offers two-week basic technician training seminars, 3-day advanced technician training seminars, and NICET-oriented inspection and testing review seminars at various locations across the United States. The 2006 schedule has been set for the following dates and locations:

2-week Basic Technician Training

March 6-17, 2006 – Chicago, IL
August 14-25, 2006 – Seattle, WA or Denver, CO
October 16-27, 2006 – Philadelphia, PA

3-day Advanced Technician Training

April 18-20, 2006 – Chicago, IL
May 16-18, 2006 – TBD
October 3-5, 2006 – Minneapolis, MN

3-day NICET Inspection and Testing Certification Review

February 22-24 – Phoenix, AZ
February 28-March 2 – Washington State
May 9-11 – Washington State
June 27-29, 2006 - Anchorage, AK
July 11-13, 2006 - Edwards, CO

For more information, contact Nicole Sprague using Sprague@nfsa.org

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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.