



Sizing Fire Pumps

The next issue of e-TechNotes will contain the “Best of June 2012” questions and answers from our EOD service. But for this quick edition between the end of June and the July 4th holiday, here are two quick questions and answers about fire pumps.

Question 1: Can a fire pump be used to meet the flow demand of fire protection systems that exceed the rating of the pump?

Answer: Yes. NFPA 20 allows fire pumps to be used with fire protection system demands up to 150% of the rated flow of the pump (see section 4.8.1 of NFPA 20-2010, similar sections in previous editions). For stationary fire pumps, the rated flow is not the maximum allowable flow. The rated flow of a fire pump is used to compare the pump’s performance to other fire pumps, and to provide details on how much pressure the pump can create at the rated flow. But the purpose of the rated flow is not to limit the amount of water that can be considered running through the pump.

Of course, the pump can only be used if the discharge pressure produced by the pump exceeds the pressure demand of the fire protection system. At a flow greater than the rated flow of the pump, the discharge pressure will be less than the discharge pressure of the pump at rated flow. This lower pressure still needs to be sufficient to meet the demand of the fire protection system in order to use the pump.

One of the reasons that fire marshals don’t always understand this position is that the centrifugal pumps on fire trucks are rated in different ways. Even though these pumps are similar to the stationary pumps we use for sprinkler and standpipe systems, the pumps on fire trucks are rated for their maximum flow capacity (see NFPA 1901, section 16.2.3). So, a fire truck with a pump rated at 1500 gpm should not be used for flows exceeding 1500 gpm. But a stationary fire pump rated at 1500 gpm can be used to satisfy flow demands of fire protection systems up to 2250 gpm.

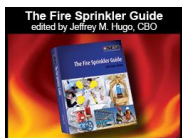
There are a variety of historical reasons for the differences in pump use and rating. Fire trucks need the net pressure that they produce to be at least 150 psi so that they can deal with the friction loss in their hoses and still get at least 100 psi to the nozzle at the end of the hose. A stationary fire pump does not need to produce so much pressure. A net pressure of 40 psi or 50 psi is still useful for sprinkler systems (and other fire protection systems). So, the amount of usable flow above the rated flow of a pump is different when these similar pumps are being used in different circumstances.

Question 2: Why does annex note A.4.8 state that use of the pump at less than 90% of its rated capacity is not recommended?

Answer: The annex note that recommends the use of pumps at 90% of capacity or above is there for two reasons. The first is financial. There is a tendency for specifying engineers to oversize pumps when writing specifications with the thought that it will cover them, but we want them to put more thought into the specification. We don’t want them to force a building owner to buy a 1000 gpm pump if they only have a demand of 750 gpm.

The second reason for the annex note is regarding efficiency. In general, a fire pump is most efficient in converting horsepower to pressure between 100% and 140% of rated capacity. Use of some fire pumps at flows less than 90% of capacity tends to have the pump use more fuel or electricity when operating at these lower flows.

It is important to point out that this annex note is just there for information. It is not enforceable as noted at the beginning of Annex A. It is extremely common to use fire pumps at flows significantly lower than their rated flow for convenience. For example, a very common use of fire



TECHNICAL TUESDAYS
for the 2nd half of 2012 have been announced.

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pumps is for combined sprinkler and standpipe systems. A single fire pump rated at 1000 gpm is common for a standpipe system. This same pump can be used to meet the flow of the fire sprinkler system in the same building, which might only be a 250 gpm demand. In this case, the pump is being used at 25% of its rated capacity. While this might cause a little more fuel or electricity to be used while the pump is running, it is still more efficient than installing a separate pump for the sprinkler system.



Upcoming NFSA "Technical Tuesday" Seminar – July 10

Topic: Is that really an Obstruction?

Instructors: James D. Lake

Date: Tuesday, July 10, 2012- 10:30 am EST

The rules governing clearance between sprinklers and partitions, library stacks and structural components are intended to provide sufficient distance for the sprinkler spray pattern to develop and deliver water over the floor area it covers. These rules vary by sprinkler type and the kind of obstruction. This seminar will explore the rules governing clearance to sprinklers and demonstrate the impact of the rules on actual sprinkler spray patterns.

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:

July 9	Denver, CO	Sprinkler System Installation Requirements
July 10	Denver, CO	Fire Service Mains & Their Appurtenances
July 11-12	Denver, CO	2-Day Sprinkler Protection of Storage
July 11	West Palm Beach, FL	Inspection, Testing & Maintenance for the AHJ
July 13	Altamonte Springs, FL	Inspection, Testing & Maintenance for the AHJ
July 24	Mashantucket, CT	Plan Review Procedures & Policies
July 24	Westminster, CO	Sprinkler Installation Requirements
July 25	Westminster, CO	Fire Service Mains & Their Appurtenances
July 26	Westminster, CO	NFPA 13 Update 2010

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.

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About the National Fire Sprinkler Association

Established in 1905, the National Fire Sprinkler Association (NFSA) is the voice of the fire sprinkler industry. NFSA leads the drive to get life-saving and property protecting fire sprinklers into all buildings; provides support and resources for its members – fire sprinkler contractors, manufacturers and suppliers; and educates authorities having jurisdiction on fire protection issues. Headquartered in Patterson, N.Y., NFSA has regional operations offices throughout the country. www.nfsa.org.

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