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Editor – *Russell P. Fleming, P.E.*

Testing Standpipe Systems

The NFSA “Expert of the Day” program often receives questions with regard to testing of standpipe systems, both for acceptance tests and for tests associated with periodic inspection and testing in accordance with NFPA 25. Manual wet standpipe systems seem to be a special problem, since these systems do not incorporate the pump needed to obtain the flow and pressures that will be needed during a fire event until the fire department pumper arrives at the scene and connects through the fire department connection (FDC).

For low and mid-rise sprinklered buildings, the use of these manual wet standpipe systems allows use of combined risers while avoiding the need for the 100 psi at the top of the riser that can pull in the requirement for a fire pump. The manual wet standpipes are allowed to be installed in accordance with Section 3.3.12.4 of NFPA 14 as further discussed in Section 5.2.5 (2007 edition). No special permission is usually needed from the fire department, since Sections 5.4.1.1 and 5.4.1.2 of NFPA 14 allow any Class I standpipe system to be a manual wet system provided the building is not a high-rise.

Here are the four basic questions dealing with acceptance and periodic flow testing of automatic and wet manual standpipe systems:

Question 1 – What is the acceptance test procedure for automatic standpipe systems that have more than one riser?

Are all risers flowed (up to the maximum 1000 or 1250 gpm) or is only the most remote riser required to be flowed?

Answer: Section 11.5.1 of NFPA 14 requires all standpipe systems, including automatic standpipe systems, to undergo a flow test during the set of tests performed at acceptance of the system. Section 11.5.1.1 goes on to clarify that the test needs to be conducted “by flowing water simultaneously from the outlet(s) indicated in the approved hydraulic calculations of each standpipe as required by Sections 7.8 and 7.10.” This means that in a building with two risers, 500 gpm needs to be flowed from the most remote riser and 250 gpm needs to be flowed from the second riser simultaneously. For larger systems, regardless of the number of risers, Section 7.10.1.1.3 of NFPA 14 states that the total system water demand need not exceed 1250 gpm, or 1000 gpm for buildings that are sprinklered throughout. Standpipe systems need to be designed with a thought as to how this acceptance flow test will be performed. However, since for most systems this test will only need to be performed once for the life of the system (see Question 3), running hose down the stairs, up to the roof or even bringing a portable tank into the building to collect the water might be acceptable options.

Question 2 – What is the acceptance test procedure for manual standpipe systems that have more than one riser? Are all risers flowed (up to the maximum 1000 or 1250 gpm) or is only the most remote riser required to be flowed? Additionally, what are the pass/fail criteria since the water supply is not required to have any specific flow or pressure?

Answer: As stated in the answer to question 1, all standpipe systems, whether automatic or manual, need to undergo a flow test during the acceptance testing of the system. Section 11.5.2 of NFPA 14 specifies that manual systems are to be tested with a fire department pumper truck or a portable pump capable of creating the same pressure and flow as the fire truck to make sure that the standpipe system can deliver the flow and pressure necessary at each point in the system. As with the automatic system test discussed in the answer to Question 1, the full flow demand of the standpipe system must be achieved with all risers flowing up to the maximum demand of 1000 or 1250 gpm.

Question 3 – After the acceptance tests are over and the building is occupied, what are the requirements for periodic flow testing of an automatic standpipe system?

Answer: Section 6.3.1.1 of NFPA 25 (2008 edition) requires automatic standpipe systems to be flow tested every 5 years. However, this test is very different from the acceptance test. For the periodic flow test, only the most remote riser is required to produce flow. The standard is not specific about the amount of flow, but it states this flow test is conducted at “the most remote hose connections of each zone” and in the annex clarifies that these are usually at a roof manifold or top of a stair. The implication is that this test should produce at least a flow of 500 gpm (250 from each of two outlets).

Question 4 – After the acceptance tests are over and the building is occupied, what are the requirements for periodic flow testing of a manual standpipe system?

Answer: Since section 6.3.1.1 in NFPA 25 only applies to automatic standpipe systems, there are technically no periodic flow tests required for manual systems. This was confirmed as recently as January of 2009 in the technical committee actions on proposed amendments leading to the 2011 edition of NFPA 25. Although it was pointed out that subsequent Section 6.3.1.3 refers to “all systems”, the committee’s statement clarified that it intends this flow test to apply only to automatic systems. Section 6.3.2 requires a hydrostatic test every five years for all manual standpipe systems, but manual wet systems that are part of a combined sprinkler/standpipe system are given a special exemption in Section 6.3.2.2.1. Inspection of the gages allows the inspector to confirm that there is water in the pipe under pressure, which in a way provides an indication of piping integrity.

Upcoming “Business Thursday” Online Seminar – March 19th

Topic: Starting a State or Local Residential Fire Sprinkler Coalition

Instructor: Dan Gengler, NFSA North Central Regional Manager

Date: March 19, 2009

The adoption of residential sprinkler language in the 2009 International Residential Code requires a plan. With a January 1, 2011 effective date, educating the public on the benefits of residential fire sprinklers and indoctrinating state and local policy makers will be necessary to pass legislation requiring total IRC adoption and compliance. Partnerships with the fire service, building officials and the sprinkler industry to name a few will be needed for success. Participating in this session will help set a course of coalition development to outreach stakeholders like the general public, developers, home builders, elected officials and new home buyers.

Upcoming “Technical Tuesday” Online Seminar – March 24th

Topic: Copper Tube for Sprinkler Systems

Instructor: Michael Friedman, P.E., NFSA Consultant

Date: March 24, 2009

This seminar will summarize all of the rules for using copper tube in NFPA 13, NFPA 13R and NFPA 13D systems. Topics will include the decision to use copper, the decision to braze or solder the copper, the use of specially listed products to join the copper and make tees, and the changes to the hydraulic calculations that need to be made when copper tube is being used.

Information and registration for the above “Technical Tuesday” and “Business Thursday” seminars are available at www.nfsa.org or by calling Dawn Fitzmaurice at 845-878-4200 ext. 133.

Additional training opportunities available through the NFSA engineering department include...

Two-Week Layout Technician Training

March 23-April 3, 2009	Cincinnati, OH
August 10-21, 2009	Omaha, NE
September 14-25, 2009	Baltimore, MD
October 12-23, 2009	Phoenix, AZ

Inspection and Testing for the Sprinkler Industry

April 7-9, 2009	Champaign, IL
April 14-16, 2009	Long Island, NY
April 21-23, 2009	Nashville, TN
June 16-18, 2009	Leominster, MA

Advanced Technician Training

June 23-25, 2009	Denver, CO
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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:

March 24-25	NFPA 13 Overview & Intro to Plan Review (2 Day)	Bettendorf, IA
March 26	Plan Review Policies & Procedures	Bettendorf, IA
March 24-25	NFPA 13 Overview & Intro to Plan Review (2 Day)	Fairbanks, AK
March 26	Inspection, Testing & Maintenance	Fairbanks, AK
March 27	General Storage	Fairbanks, AK
March 24	Inspection, Testing & Maintenance	Freeport, ME
March 25	Sprinklers for Dwellings	Freeport, ME
March 26	CPVC Sprinkler Piping (1/2 Day AM)	Freeport, ME
March 26	Commissioning & Acceptance Testing (1/2 Day PM)	Freeport, ME
March 30	Introduction to Sprinklers (1/2 Day AM)	Anchorage, AK
March 30	CPVC Sprinkler Piping (1/2 Day PM)	Anchorage, AK
March 31	Pumps Layout & Sizing (1/2 Day AM)	Anchorage, AK
March 31	Commissioning & Acceptance Testing (1/2 Day PM)	Anchorage, AK
March 31	NFPA 13 Update	Willoughby, OH
April 1	Hydraulics for Fire Protection	Willoughby, OH
April 2	General Storage	Willoughby, OH

For more information on these seminars, or to register, please visit www.nfsa.org or call Dawn Fitzmaurice at 845-878-4207 or email seminars@nfsa.org.

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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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