

## U.S. Fire Administration / National Fire Academy

*Coffee Break Training***Topic: Fire Flow Testing for Sprinkler Protection**

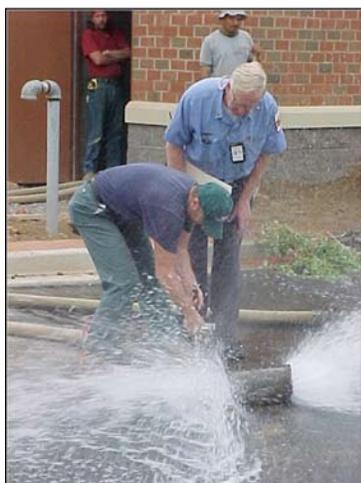
**Learning objective:** The student shall be able to identify common issues related to the accuracy of water supply data collected for fire sprinkler protection.

With the preponderance of today's automatic sprinkler systems being "hydraulically calculated," the importance of accurate water supply information is paramount. Giving a sprinkler designer or property owner inaccurate test results can lead to faulty design or worse, a sprinkler system failure when it is needed most.

According to NFPA 13, *Standard for the Installation of Automatic Sprinklers*<sup>™</sup>, "The volume and pressure of a public water supply shall be determined from waterflow test data. An adjustment to the waterflow test data to account for daily and seasonal fluctuations, possible interruption by flood or ice conditions, large simultaneous industrial use, future demand on the water supply system, or any other condition that could affect the water supply shall be made as appropriate." The standard does not specify who is required or qualified to perform the test and evaluate the results.

There are many variables the test team should consider when performing a fire flow test:

- How trained and qualified in fire flow testing and hydraulic principles are the persons conducting the test?
- How accurate are the pressure and pitot gauges? Have they been calibrated lately? How does one register the pressure when the gauge needle fluctuates among various values? How accurately were the values entered into a programmed computer formula or manually transferred to an N graph?
- Are there pending commercial, industrial, institutional, or residential developments in the neighborhood that will have a deleterious effect on the water supply?
- Has the test been taken under worst-case conditions? What is the water level of the reservoir or supply tank?
- How far is the test site from the proposed sprinkler installation? Were friction loss and elevation differences considered in the calculations?
- Was there a municipal or private fire pump running or off during the test? How does that feature influence the test results?
- What time of day was the test taken, when domestic and industrial water demand was low, normal, or high?



Before a fire department conducts water supply tests for fire sprinkler designs, it should check with the agency's legal counsel to learn if there are any potential liabilities from this practice.

For additional information, refer to NFPA 13, *Standard for the Installation of Automatic Sprinklers*<sup>™</sup>, or go to [www.nfaonline.dhs.gov](http://www.nfaonline.dhs.gov) to take the self-study National Fire Academy course *Testing and Evaluation of Water Supplies for Fire Protection* (Q218).