

This issue of TechNotes was written by Michael Joanis, PE, Chief Engineer for the NFSA.

## Acceptance Testing Modifications to Existing Systems

Starting with the 2019 edition of NFPA 13, the requirements for modifications to existing systems were consolidated to Chapter 29. Prior to the 2019 edition of the standard, these requirements were located throughout in various chapters based on the topic being addressed. The existing systems chapter was later pushed back to Chapter 30 in the 2022 edition when Chapter 26 was added to address special designs for storage protection.

The existing system modification chapter covers several topics including general requirements, system components, sprinklers, renovating existing pipe schedule systems, renovating existing hydraulically designed systems, system design criteria, and testing. The focus of this TechNotes is the changes NFPA 13, 2022 edition, Chapter 30 makes to the acceptance testing requirements that are specific to modifications of existing systems.

It is important to note that Chapter 29 for acceptance testing still applies when applicable to the system modification work being conducted. For example, if the modification includes the installation of a waterflow switch, Section 29.2.3.1 requires the new flow switch to be operationally tested. However, Chapter 30 for modifications to existing systems, specifically Section 30.8 for testing, makes two significant changes to the hydrostatic and pneumatic testing of modifications to existing system piping.



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The base acceptance testing requirement in Section 29.2.1 for hydrostatic tests, indicates all piping and attached equipment subject to system working pressure shall be hydrostatically tested at 200 psi and shall maintain that pressure without loss for 2 hours. This section goes on to require when systems are normally subject to working pressures more than 150 psi, they shall be tested at a pressure of 50 psi more than system working pressure.

However, Section 30.8.1 for modifications to existing systems, specifically amends the hydrostatic testing requirements. This section permits modifications to existing piping systems that affect twenty sprinklers or less, or that cannot be isolated, be tested at system working pressure. This eliminates the requirement for a minimum 200 psi hydrostatic test pressure. This section goes on to indicate that where isolation of existing system modifications is possible, testing should be conducted at not less than 200 psi.



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The intent of the standard is that all new systems be hydrostatically tested at a minimum of 200 psi for two hours. This is to ensure the initial system installation can withstand that pressure without any failures or leaks. This test is used to verify the proper installation and condition of the system components once installed and prior to being placed in service. For example, if a threaded fitting or mechanical coupling has not been properly tightened during installation, the hydrostatic test may uncover this condition by producing a leak and loss of test pressure.

The requirements of Section 30.8.1 address additions and modifications to existing systems that have been previously fully acceptance tested when initially installed. Separating, or isolating, new work from existing systems is difficult and, in many cases, not possible. To require the entire system, both new work and existing piping, to undertake another complete hydrostatic acceptance test when only minor modifications have been made is unreasonable and not required. Modifications that cannot be isolated include new sprigs, drops, or armovers used to install new sprinklers in a revised location. The standard permits hydrostatic tests conducted at the system's normal static pressure. This allows existing portions of the system to be tested at system working pressure and not subject to a new minimum 200 psi hydrostatic test.

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The allowance in this section is often overlooked by both contractors and authorities having jurisdiction (AHJ). It also requires common sense be applied to what can and cannot be "isolated." The intent of the standard is to not require unreasonable additional work and cost to the owner. It is important to note that modifications to existing systems that cannot be isolated are still being hydrostatically tested. They are just being tested at system working pressure and not the minimum 200 psi required for new system installations.

The standard also modifies the requirements for testing modifications to existing dry pipe and double interlocked preaction systems. The base requirement for new systems in Section 29.2.2 indicates both a hydrostatic test and air test be conducted. The air test requires the system maintain 40 psi for 24 hours with 1 ½ psi or less of air loss. However, Section 30.8.2 amends these requirements. Modifications may be tested at 40 psi of air for 2 hours with a maximum 3 psi pressure loss. Alternately, these system modifications may be tested at normal system air pressure, with the air source shut off for 4 hours, without enough air loss to activate the low air pressure switch.

There were no technical changes to the 2025 edition for acceptance testing modifications to existing systems. Chapter 30 was reformatted, and these requirements were relocated in kind to Section 30.7. When modifying an existing system, it is important to review all the requirements in Chapter 30. Ensuring existing systems are properly modified, including proper acceptance testing, confirms proper system performance. This promotes the NFSA's mission to protect lives and property from fire through the wide-spread acceptance of the fire sprinkler concept.

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21-Apr-25	18-May-25	May 19-21, 2025	St. Louis, MO
11-Aug-25	7-Sep-25	September 8-11, 2025	Tacoma, WA

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## Sign-Up for the next Tech Tuesday!

Our next Tech Tuesday will be October 15, 2024 from 12:30 pm to 1:30 pm eastern time. The topic will be Modifications to Existing Sprinkler System.

It can be challenging when designing modifications to existing sprinkler systems when buildings are renovated, change use, or receive an addition. Designers need to first understand the proposed building modifications. Such information can usually be found in the architect's proposed floor and reflected ceiling plans. Then they have to determine the layout and design criteria of the existing sprinkler system. This information is often unavailable, hard to find, or requires a complete survey of the existing system. They must also review the codes and standards to determine the applicable requirements when working in an existing building. Finally, they must design and layout the new and/or modifications to existing systems.

Member Cost: Free

Non-member Cost: \$50.00 [Learn more about membership.](#)

**\*\*UPDATE\*\*** We have updated our enrollment process for Tech Tuesdays. If you have already registered for this Tech Tuesday, please disregard any links you have received. You will receive a reminder email with the updated link on the Monday prior to the Tech Tuesday session going forward. It is vital to ensure participation credit for attendees to log on with the Microsoft account they used to register. The link should not be shared as those participants will not be able to be tracked.

[Register for the next Tech](#)

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