Coffee Break Training - Fire Protection Series

Automatic Sprinklers: Retarding Chambers

No. FP-2011-8 February 22, 2011

Learning Objective: *The student shall be able to explain the purpose and function of a retarding chamber on a wet-pipe sprinkler system.*

Wet-pipe sprinkler systems may be equipped with an alarm check valve assembly* that contains a free-pivoting clapper that opens when the incoming water moves due to a sprinkler operating, a broken pipe, an inspector's test valve opening or even a water surge. The alarm check valve typically has two attached pressure gauges (supply pressure and system pressure), as well as an outlet piped to a water motor gong or electronic flow alarm device.

Where alarm check valves are installed under conditions of variable water pressure, National Fire Protection Association (NFPA) 13, *Standard for the Installation of Sprinkler Systems*, requires the installation of an alarm retarding device so periodic pressure surges do not result in unwanted false alarms. Alarm retarding devices may consist of listed, time-delayed flow or pressure switches, or mechanical devices such as the retarding chamber in today's illustration.

This retarding chamber attached to the wet-pipe sprinkler system reduces the likelihood of false alarms caused by water surges.

When a water surge occurs, the clapper in the alarm check valve opens slightly and allows water to flow into the retarding chamber from the horizontal pipe to the right of the chamber. The retarding chamber is a simple reservoir that collects the excess water from the surge. If the surge does not exceed the capacity of the reservoir, once the surge stops the water will drain from the retarding chamber and no water flow alarm is transmitted.

If the surge continues—or water is flowing to control a fire—the retarding chamber will fill and the water will be discharged out the top pipe that leads to a water motor gong, an electronic pressure switch, or perhaps a flow switch.

Retarding chamber assemblies are required to have a strainer to prevent rocks and other debris from passing through them. The strainer should be located at the outlet of the retarding chamber unless the retarding chamber is provided with an approved integral strainer in its outlet.

For additional information, refer to NFPA 13, Chapter 8.

---

* So-called "shotgun" wet-pipe riser assemblies do not include an alarm check valve, and consist only of a main control valve, a pressure gauge, and an electronic flow switch.