Backflow Prevention for Fire Protection Systems

Arkansas Department of Health
Bureau of Environmental Health Services
Division of Engineering
4815 West Markham Street
Little Rock, Arkansas 72205
(501) 661-2623

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BACKFLOW PREVENTION FOR FIRE PROTECTION SYSTEMS

Owners of commercial and industrial establishments be advised: backflow prevention assemblies are required on existing fire sprinkler systems when they are modified, extended, or enlarged.

by

John Hedgecock
Arkansas Department of Health

As of July 1, 1994, all new fire sprinkler systems installed in commercial and industrial establishments in the state must have backflow preventers installed to protect the public water distribution systems from water backflow. The type of backflow preventer required is dependent upon the hazard level or classification of the fire protection system.

City officials may wonder why a fire protection system must be equipped with a backflow preventer. One reason is that many wet type fire sprinkler systems have antifreeze or other chemicals added to prevent freezing. These chemicals are toxic to humans and animals. In addition, the water in the wet systems that do not have chemicals added sometimes remains in the pipe for months or even years; that water becomes a black soup of cutting oils, water, metal contamination and bacteria. Many fire protection systems have booster pumps and/or storage tanks which could back pressure the public water system. Some fire protection systems are connected to non-potable auxiliary water systems. These are some of the reasons why a fire sprinkler system is required to be equipped with a backflow preventer.

Some of the fire protection systems are the dry type. Some are a combination of wet and dry types. These systems do not have water standing throughout the entire sprinkler system. The pipes have air, under pressure, in them. In the past, air has sometimes been pumped into the water distribution system from dry type fire sprinkler systems creating problems. There are other types of fire protection systems but the wet and dry types are most often used.

The Arkansas Department of Health (ADH) requires the use of an approved backflow preventer. A Double Check Valve Assembly (DC) or a Reduced Pressure Principle Backflow Prevention Assembly (RP) is required depending upon the hazard level of the system. The assemblies must meet American Water Works Association standards. Some local waterworks such as Fayetteville Waterworks and the Little Rock Municipal Water Works require the use of detector check valve assemblies; namely, the Double Detector Check Valve Assembly (DCDA) or the Reduced Pressure Detector Check Valve Assembly (RPDA). The use of the detector check valves will alert the Waterworks to the clandestine use of water via the fire sprinkler system. Local waterworks must meet the minimum standards of the ADH but may be more stringent in its requirements.

Why not use a swing check valve or even use two of them in series, which would be much cheaper and they have been used in fire sprinkler systems for years? They are no longer acceptable because the technology of cross-connection control and fire protection system hardware is constantly improving. Swing check valve discs will tend to freeze in place over the years due to corrosion and the growth of biological organisms in the check valve.
Many times swing check valves have been found frozen in the open position. The DC-and-RP-type assemblies have resilient seats to prevent leakage and they are equipped with test cocks for testing the units for leakage. If the RP-type unit fails, which is almost unheard of in a properly installed and maintained unit, it will fail-safe. The ADH requires annual testing of the hardware by certified testers.

While the ADH's Policy for Cross-Connection Control for Fire Protection Systems requires the installation of DC or RP-type hardware on new fire protection systems, existing fire protection systems are not required to install them until the system is modified, extended or enlarged.

When a commercial or industrial establishment's fire sprinkler system is modified, extended or enlarged then the system is required to be upgraded at that time to bring the entire system into compliance with ADH policy. Exceptions may be made in cases where the replacement of ordinary check valves with DC or RP-type backflow preventers on existing systems reduces the flow to a point that the systems no longer complies with fire department or insurance requirements.

Fire protection system design professionals have reported to the ADH that the average owner is unaware of the requirement for upgrading his or her system if it is modified. Consequently, they are shocked and disbelieving when they are given a cost estimate for modifications or extensions. The source for this requirement comes from the Rules and Regulations Pertaining to Public Water Systems. The latest edition was adopted in January 1995 by the Arkansas Board of Health and signed into law by Governor Tucker.

If you have questions about the current regulations or want a copy of the Policy for Cross-Connection Control for Fire Protection Systems please contact John Hedgecock, P.E., at the Arkansas Department of Health, Mail Slot #37, 4815 W. Markham St., Little Rock, AR 72205 or at 501-661-2623.