

Don't Let Your Control System Control You

By following some simple guidelines, you'll ensure control valves operate optimally and provide years of trouble-free service. **BY MARK MAGDA**



REGULAR MAINTENANCE ensures valves remain healthy. If your system is operating properly, you should physically inspect all valves at least every 12 weeks to check for tubing leaks and other abnormalities. Pressure gauges should be checked to ensure each valve is performing as designed. If you find something wrong, refer to the appropriate instruction manual, which may be available online.

Because valves are under pressure, care should be taken to bleed the pressure before a valve is taken apart. For example, in a 6-in. valve with 100 psi in the line, at least 2,800 pounds of force is trying to push off the valve cover.



Isolation ball valves should be exercised with the handles returned to an in-line position to ensure a full open water way.

PILOT SYSTEM SHUTOFF BALL VALVES

Exercise the main valve's three pilot-isolating valves, which are located in front of the strainer on the upstream side of the valve, on the bonnet over the top of the valve, and below the pressure-reducing pilot on the valve downstream. Turning the isolating ball valve a quarter turn to the closed position and returning it to the open position is sufficient. In the open position, the isolating valve's handle lines up with its body.

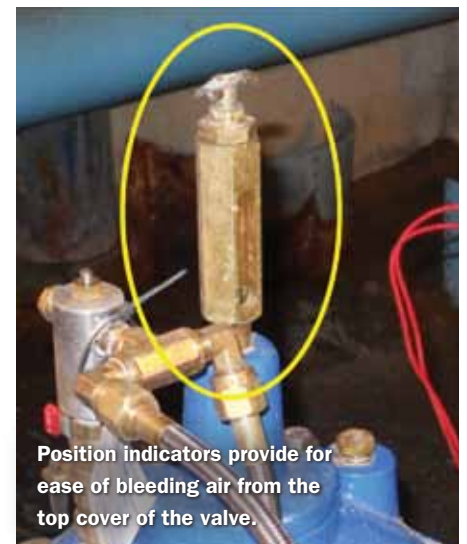
AIR IN THE PILOT SYSTEM

Air, the pilot system's primary enemy, causes false readings and poor valve operation. Bleed air from the valve bonnet. If the valve is equipped with a position indicator, a bleed cock will be located on top of the position indicator. Open the bleed cock slightly by turning the handle counterclockwise.

If the valve doesn't have a position indicator, bleed air from the valve's high point. If the water runs clear and no air bubbles are seen in the position indicator's glass, close the bleed cock. If air is present, indicated by foamy white water, run the water until the air dissipates.

STRAINERS

Pilot systems rely on a supply of clean water, usually taken from the valve inlet. External or flush clean strainers can be installed. If an external strainer is installed, an occasional flush is a good idea. Cleaning the strainer screen for 3–5 seconds is usually sufficient. After you've gained some experience, you'll know whether flushing should be conducted for a longer period.



Position indicators provide for ease of bleeding air from the top cover of the valve.

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Alternate pilot system tubing options, such as stainless steel braided tubing, help ensure long control valve pilot system service life and function.

flow and the other handling large or fire flows—the larger valve should be operated for a minimum of five minutes. This can be done by closing the isolating cock on the downstream side of the smaller valve pilot system (the cock below the pressure-reducing pilot). This will close the smaller valve and cause the larger valve to open, allowing flow into the system. These steps can be used for a larger valve when it's in flowing mode.

This is also a good time to ensure the main line control isolating valves are in good working order. The gate or butterfly valves used to isolate the control valve should also be checked in case they're needed.

MINIMIZING WATER LOSS

Nonrevenue water—water the utility distributes and doesn't ultimately bill for—is costly to a utility. Unground leakage, pipe breakage, and overflowed storage tanks are all forms of water loss experienced by utilities.

Pressure-reducing valves are a key component for a utility that undertakes a major water loss project where multiple district metered areas or pressure zones typically will be required. Neglected maintenance of pressure-reducing valves can lead to overpressures in the distribution system, pipe breakage, and potentially catastrophic damages.

In addition to normal maintenance, the purchase of pilot-operated control valves shouldn't be taken lightly. These valves are built to different standards worldwide, and different quality materials may be used by different manufacturers. There are also many different options that can be added to increase the life of these valves or that can make maintenance much easier. Make sure you research the valves, and remember the specification you create should focus on a long service life and ease of maintenance. Following this routine can help provide years of trouble-free service.

Some water utilities install a ball valve on the strainer's flushing plug, allowing operators to conduct a short flush every time they're in the valve station. A plugged strainer can cause major problems.

REDUCING PILOT

Ensuring the control valve pilot is operational is easy. However, before adjusting the pressure, ensure that doing so is acceptable for the system and that supervisory control and data acquisition system alarms are turned off. To exercise the pressure-reducing pilot, loosen the

lock nut on the pilot-adjusting screw and turn the screw clockwise to increase the pressure 5 psi above the normal set point.

After ensuring the downstream pressure gauge is tracking the adjustments, turn the adjusting screw counterclockwise to reduce pressure to 5 psi below the set point. Next, turn the adjusting screw clockwise to increase the pressure to the original set point and tighten the lock nut. If the pressure gauge doesn't move as you adjust the screw, the gauge is bad or a pilot should be examined.

MAIN VALVE FLOWS

Just as we drive our cars to give them an occasional running workout, valves also need to have an occasional flow-through workout. During a major fire isn't a good time to find out the main valve won't fully open. Get some water flowing through the valve station to open the peak demand/fire-flow valve. This could be as simple as opening a hydrant on the outside of the valve station.

If a station or vault has two valves in parallel—with one valve handling normal



External strainers provide a convenient way to regularly flush dirt and debris from the strainer.

PHOTOGRAPHS: SINGER VALVE