

Fabri-Valve® Helps Water Works “Pig” Pipeline

Imagine walking on an inspection tour of a six-foot diameter, dark aqueduct pipe, where the only thing between you and a flood of 160 psi water is a closed valve. And by the way, the nearest exit is a mile away. Reliably holding back that flood of water are 72” Fabri-Valve knife-gate valves from ITT Engineered Valves (EV).

That is the situation at Utah’s Jordan Valley Water Conservancy District (JVWCD), where aqueducts supply raw water from the Uinta Mountain Range to a 180 million gallon per day water treatment plant serving customers and communities throughout a large part of the greater Salt Lake Valley.

Cleaning With a “Pig” to Improve Water Flow

The reason behind the inspection tour of the aqueduct is an upcoming cleaning of the entire inside of the 17-mile long aqueduct. As the aqueduct delivers raw water from the mountains, grit, sediment and even moss coats the inside of the pipe, reducing its flow characteristics. According to Alan Packard, PE, engineering department manager for the JVWCD and manager of the cleaning project, the intended capacity of the aqueduct was 270 cubic feet per second (cfs). The deposits on the pipe have reduced that flow to 240 cfs. This amounts to almost 20 million gallons per day of flow capacity lost due to the coating.

During the first weeks of December, 2004 the JVWCD initiated a cleaning process called “pigging” to scour the interior of the pipe, removing the layer of sediment. This is accomplished by running a cylindrical foam device covered with bristle-imbudded urethane through the pipe. The device is called a “pig.” How it became known as a pig is not clear, but an expert at the Pigging Products & Services Association (PPSA) speculated that when pipe pigs were first used in Texas around 1870, they were made of bundles of leather and made a squealing sound when they came out at the end of the pipe. This reminded people of a pig squealing – thus the name ‘pig’ was adopted. The pressure of the water flow behind the pig forces it through the aqueduct.

Butterfly Valves Replaced

When the aqueduct was originally constructed, 72” butterfly valves were installed throughout its length. Because the pigging device takes up the entire area of the pipe, the pig would not be able to pass by the butterfly valves. In the Summer of 2003, all three butterfly valves were replaced by Fabri-Valve bonneted knife-gate valves from ITT EV. The gate of the valves fully retracts and provides an unrestricted full flow port, which allows the pig to pass through.



ITT EV offers bonneted Fabri-Valve knife gate valves for difficult services such as buried service requiring gate protection and high cycle stem sealing. The cylindrical packing around the stem provides a tight, easy to maintain stem seal. The 72" valves used in this aqueduct had:

- 304 stainless steel wetted components and a carbon steel exterior
- A bonnet to protect the gate and a dirt shield to protect the actuation
- Dual, replaceable neoprene seats
- A special seat protector to shield the soft neoprene seats from the abrasive bristles of the pig
- Electric actuator

In addition to this raw water application, the Fabri-Valve knife-gate valves can be employed to handle process fluids for the pulp and paper, chemical, petroleum, refining, mining, waste water, power and marine industries.

As for taking a walking tour of the pipe, Packard notes that, "we expect that after the pigging operation is complete, we will walk and inspect it to see how well the cleaning has been done. If needed, we can do an additional pass." While the valves are seldom operated - being held mostly in the open position - they will need to work perfectly during this inspection process.

Keeping up With Demand

The Uinta Mountains east of Salt Lake City are a valuable natural resource. The Central Utah Project was constructed to convey water from these mountains to a growing population along the Wasatch front. The aqueduct is an important component of the Central Utah Project, conveying a high quality water supply to over 950,000 people who live and work in Salt Lake County.

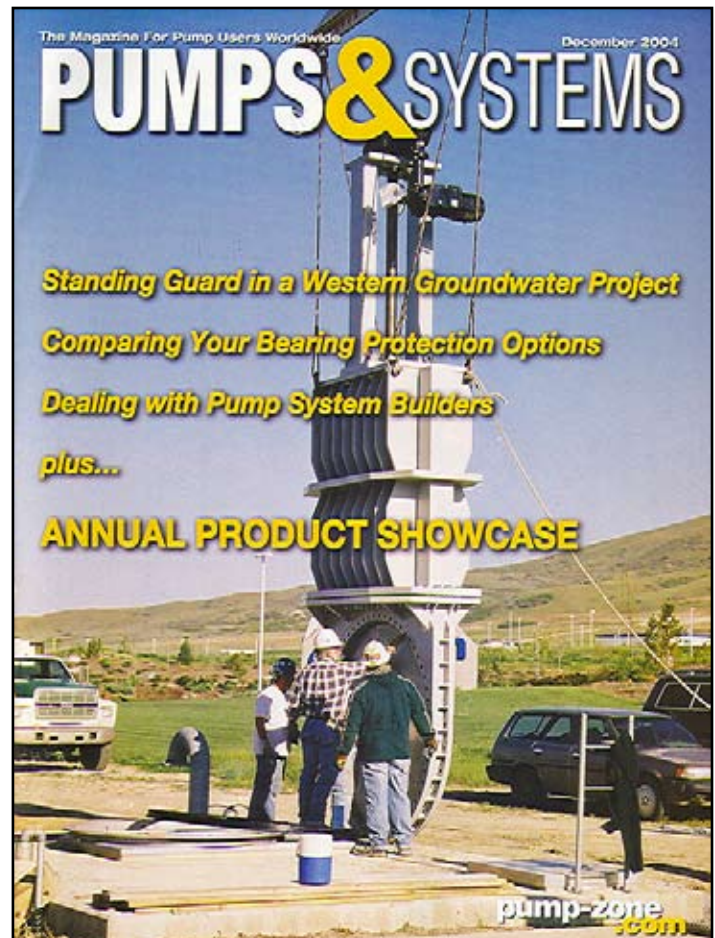
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The JWCD is primarily a wholesaler of water to cities and improvement districts within Salt Lake County. It also has a retail service area in unincorporated areas of the county. Jordan Valley is now the largest municipal water district in Utah, with 90% of its municipal water delivered on a wholesale basis to cities and water districts and 10% on a retail basis to unincorporated areas of Salt Lake County.

As the demand for more water continues to increase in the Salt Lake metropolitan area, keeping the aqueducts clean and capable of delivering maximum flows is a prudent investment. The JWCD recently used the pigging process to clean a 12-mile section of another 78" diameter aqueduct with great success. Test results after the pigging operation showed that the aqueduct flow capacity increased 22.5 percent from 129 million gallons per day to 158 — an increase of 29 million gallons per day — exceeding the estimated 20 million gallons a day expected. Similar results are expected after the cleaning this December.



The December 2004 Issue of Pumps & Systems featured the story about ITT EV's Fabri-Valve knife gate valve and Utah's Jordan Valley Water Conservancy District.