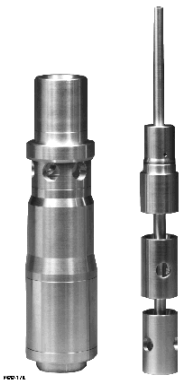
Equipment Repair Costs Reduced using Fisher® Valves with Dirty Service Anti-CavitationTrim

RESULTS

- The elimination of water hammer damage to equipment has saved the company over $80,000 in repair costs.
- Mine water pressure has been stable since installing the valves with no more overpressure situations.



Fisher® Dirty Service Trim (DST) is a patented multi-stage, anti-cavitation control valve trim for use with fluids having entrained particulate.

APPLICATION
Pressure Reducing Valves

CUSTOMER
Large gold mining operation

CHALLENGE
The ground water at this gold mine, located in the most prolific gold producing area of North America, is about 145°F (60°C) due to deep hydrothermal activity. A large 10MW refrigeration plant was built to chill water and cool the mine ventilation air to provide sufficient cooling for the miners underground.

The mine water distribution system was designed to supply up to 3,000 gpm of chilled water through an eight-inch steel pipeline in the production shaft to underground mining operations. Water hardness is in excess of 450 mg/L (ppm) resulting in severe scale buildup in pipes and valves. Scale can flake off the inside of pipes resulting in large particulate matter which can cause blockages in valves and instruments.

Water pressure in the shaft is regulated using pressure regulators installed every 300 feet in elevation. The lowest mine level is 1925 feet below surface. Required pressure at the working areas should be no more than 100 psig.

The eight-inch water supply line in the production shaft was sized for 3,000 gpm flow rate. However, typical service water consumption is only 300 to 600 gpm with a peak flow of 1,000 gpm. The eight-inch existing pressure reducing valves (PRVs) cannot control the pressure at low flow rates, become unstable, and open up resulting in severe water hammer at pressures greater than 500 psi.

FISHER®
Severe Service

EMERSON™
Process Management

The PRVs needed to be reset frequently and PRVs located in the shaft are difficult to access, since they are not all installed at convenient locations.

Water hammer damages mining equipment such as jumbo drills. Flushing water passes through the rock drill (known as a drifter) and the drill steel to flush the holes. Water overpressure damages the rock drill seals and the drifter loses lubrication and is damaged. The cost to repair each unit is in excess of $40,000.

SOLUTION

The Emerson local business partner proposed using a Fisher six by four-inch EWT body globe valve with three-stage dirty service trim to be installed in-line with each PRV. The valves must handle the full head of water in case the PRVs fail and must be able to handle particulate matter and potential scale. The first valve was installed at 1,225 level (main working level) in 2004. Additional valves were installed at 925 Level in 2005 and at the 1,600 level in 2007.

The dirty service trim is designed to protect against damaging cavitation up to 1,500 psi and can pass particulates up to 3/8" in diameter. It uses a protected seating surface and can be used in flow up or flow down applications in globe or angle bodies. Characterized trims are available.

RESULT

Since installing the dirty service trim valves, mine water pressure has been stable. The elimination of water hammer damage to equipment has saved the company over $80,000 in repair costs.

For more information on severe service solutions, visit www.fishersevereservice.com.

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