

# Equipment Repair Costs Reduced using Fisher® Valves with Dirty Service Anti-Cavitation Trim

## 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.



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



Severe Service

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](http://www.fishersevereservice.com).

© Fisher Controls International LLC 2009 All Rights Reserved.

Fisher is a mark owned by one of the companies in the Emerson Process Management business division of Emerson Electric Co. Emerson Process Management, Emerson, and the Emerson logo are trademarks and service marks of Emerson Electric Co. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice. Neither Emerson, Emerson Process Management, nor any of their affiliated entities assumes responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end-user.

#### NORTH AMERICA

**Emerson Process Management**  
Marshalltown, Iowa 50158 USA  
T 1 (641) 754-3011  
F 1 (641) 754-2830  
[www.EmersonProcess.com/Fisher](http://www.EmersonProcess.com/Fisher)

#### LATIN AMERICA

**Emerson Process Management**  
Sorocaba, Sao Paulo 18087 Brazil  
T +(55)(15)238-3788  
F +(55)(15)228-3300  
[www.EmersonProcess.com/Fisher](http://www.EmersonProcess.com/Fisher)

#### EUROPE

**Emerson Process Management**  
Cernay 68700 France  
T +(33) (0)3 89 37 64 00  
F +(33) (0)3 89 37 65 18  
[www.EmersonProcess.com/Fisher](http://www.EmersonProcess.com/Fisher)

#### MIDDLE EAST & AFRICA

**Emerson FZE**  
Dubai, United Arab Emirates  
T +971 4 883 5235  
F +971 4 883 5315  
[www.EmersonProcess.com/Fisher](http://www.EmersonProcess.com/Fisher)

#### ASIA PACIFIC

**Emerson Process Management**  
Singapore 128461 Singapore  
T +(65) 6777 8211  
T +(65) 6777 0947  
[www.EmersonProcess.com/Fisher](http://www.EmersonProcess.com/Fisher)

