

Fisher™ HPT Valves with Cavitrol™ III Characterized Trim Reduce Power Plant Maintenance Costs by Over \$60,000 USD Per Year

RESULTS

- Drum level control and overall plant performance were improved by converting to automatic control and shortening unit start-ups.
- Fisher™ HPT valves with Cavitrol™ III characterized trim reduced plant operations and maintenance costs by more than \$60,000 USD per year.
- Fisher FIELDVUE™ DVC6005 digital valve controller with advanced diagnostic capability was utilized for predictive PlantWeb alert notifications and integrated into the plant's AMS Suite.



Fisher™ HPT valves with Cavitrol™ III trim reduce cavitation and improve control in boiler feedwater application.

APPLICATION

Start-up valve and main feedwater regulator

CUSTOMER

900-megawatt combined cycle power plant in Hardeeville, SC

CHALLENGE

The power plant was experiencing issues with poor control, seat leakage, and low reliability. The main feedwater valve and its start-up valve were inappropriate for the application, especially in size. The main valve was much too large and only operated when the duct burner system was placed in-service. While in-service, however, the main valve operated too close to the seat, causing leakage in the start-up and main feedwater valves.

The plant was then forced to use the motor operated block valves to isolate the system during drum filling, which also became a maintenance nuisance. After many attempts to get sizing and service issues resolved with the existing valves, the customer decided to explore other options to correct these problems.

SOLUTION

The customer contacted Emerson’s regional sales representative, R.E. Mason, to assist in diagnosing and correcting the issues. It was recommended that three six-inch Fisher HPT valves with customized Cavitrol III trim would replace the existing start-up and feedwater valves. A Fisher FIELDVUE digital valve controller with advanced diagnostic capability was also utilized to operate the valve in its correct flow travel range and lessen seat damage caused by the valves operating too close to the seat.

Cavitrol cages have specifically-shaped holes, spaced diametrically around the cage circumference. These holes reduce fluid turbulence, dissipate fluid pressure, and help increase capacity.

A low inlet pressure to the final stage is maintained by the flow-down configuration and the successively larger flow area of each stage. At the third stage inlet (see graph), about 85% of the total pressure drop has already occurred and the vena contracta pressure remains above the liquid vapor pressure. This helps prevent future cavitation from occurring.

Fisher products were chosen for this project in large part because of the service capabilities; valves could be manufactured and supported locally through Emerson service personnel. This particular power plant also utilizes a fully functional 1000 tag AMS Suite and over 400 smart instruments, taking advantage of the predictive maintenance promise of PlantWeb technology.

The previous valves were costing over \$60,000 USD to repair each year. The new Fisher valves have significantly reduced, if not eliminated, this maintenance expense. The valves are no longer split-ranged and operate under automatic control, improving the reliability of the unit. Overall plant efficiency has also improved, as drum level control is noticeably more consistent and the single control valve with a characterized trim can handle all operating flow requirements for the power plant.

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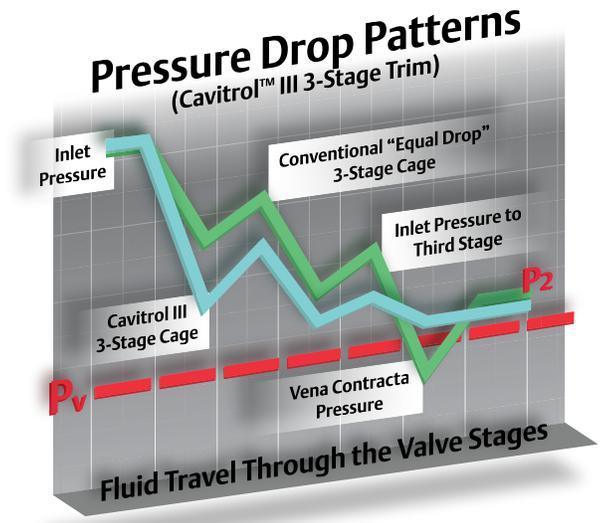
 <http://www.Linkedin.com/groups/Fisher-3941826>

Emerson Automation Solutions
 Marshalltown, Iowa 50158 USA
 Sorocaba, 18087 Brazil
 Cernay, 68700 France
 Dubai, United Arab Emirates
 Singapore 128461 Singapore

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Comparison of pressure drop patterns between a conventional cage and Cavitrol III trim.