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Severe Service Journal

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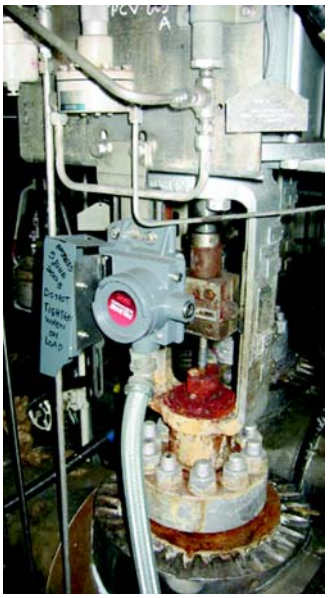
FISHER® DIGITAL VALVES AND Whisper® TRIM IMPROVE CONTROL AND REDUCE NOISE, VARIABILITY AND MAINTENANCE FOR POWERPLANT

PowerSeraya supplies 30% of Singapore's energy needs and, like other power plants, deals with its share of maintenance problems. Fisher® digital valves with customized trim and diagnostic capabilities, however, are helping them monitor and reduce valve-performance problems before they become costly failures.

A physical inspection of a competitor's valve installed at the site indicated that the bottom 20% of its cage had deteriorated. The damaged cage affected valve travel between the 0 - 19% mark and contributed to high friction and variability. (The cage was made up of 22 stacks of noise trims, and the bottom four had deteriorated.)

Fisher sales personnel in Singapore conferred with members of the Severe Service team in Marshalltown (USA) and recommended replacing the deteriorated cage with Whisper® III trim. Whisper trim provides up to 30 decibels of noise attenuation. It lowers valve noise by utilizing multiple orifices of special shape, size, and spacing. These orifices break up turbulent fluid streams and thereby reduce noise-producing interactions. The trim shifts acoustic energy to higher frequencies that are not readily absorbed by downstream piping. At high frequencies, the piping radiates much less sound in the audible range, reduces strain energy, and combats piping fatigue.

Besides the Whisper trim, Fisher supplied 25 new Design EH, ET, and V500 valves for steam pressure, feedwater, and limestone slurry flow applications at the PowerSeraya site. All of these valves were equipped with FIELDVUE® DVC6000 instruments with Performance Diagnostic (PD) capabilities. The plant previously used Japanese-manufactured valve positioners in its auxiliary steam supply area. Operating under ambient temperatures of 60-70 units could not reduce variability and oscillation to less than 4 bar. After applying DVC6000-PD positioners to the steam-control valves, however, the variability dropped significantly, from 4 Bar to 1.9 Bar —a 200% improvement.



DIRTY SERVICE TRIM RETROFIT SOLVES FEEDWATER PUMP RECIRCULATION PLUGGING PROBLEMS FOR PENNSYLVANIA POWER STATIONS

Two large supercritical power stations in Pennsylvania were having problems with the boiler feedwater recirculation (BFWR) valves applied to auxiliary boilers. The two valves (one for each boiler) with concentrically drilled-hole cages were constantly being plugged with particulate due to dirty feedwater. Sometimes the cages could be cleaned, but most of the time a replacement cage was required.

Frustrated, maintenance personnel at the plant contacted Equipment & Controls, their Local Fisher® Business Partner, for a solution. Equipment & Controls' engineers in turn contacted members of the Fisher Severe Service Team in Marshalltown, Iowa. Together, the Fisher team members evaluated this application and its associated valve-trim problems. New valve trim, specifically two-stage Dirty Service Trim (DST), was needed to resolve the plugging problem.

The DST design combines axial and radial flow paths that feature large openings. Thus, DST passes entrained particulate up to 3/4-inch and provides pressure-staging to eliminate potentially damaging cavitation and velocity-induced erosion. A protected seat design separates the shutoff function of the trim from its throttling areas, resulting in excellent wear resistance.

The trim-conversion was completed using the existing valve body and actuator. The valve and its new trim improved flow control of the dirty feedwater while protecting both the valve and its piping from cavitation. Start-ups at the power station were smooth, and operators no longer considered the BFWR valve the "weak link" in their process.

After evaluating this trim conversion for about 18 months, the power station decided to install DST trim in the other BFWR control valve on the second auxiliary boiler.

Word of this success reached the facility's sister plant, which had been experiencing similar problems with its pneumatically actuated valves. That site, too, installed two-stage DST trim in its BFWR control valves for both units.

Now the two stations, their auxiliary boilers, and their feedwater recirculation control valves have been operating without problems during start-up operations.

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