

Severe Service Journal

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ADDRESSING WATER INJECTION VALVES WITH DIRTY SERVICE TRIM ELIMINATES CAVITATION

Water injection service can be one of the most difficult applications on an offshore platform. High pressure water is injected into the well to dispose of water recovered from processing or to help facilitate product flow by displacing depleted product. The water injected into the well contains residual components such as sand and other suspended solids. These entrained particles combined with the high pressure drops associated with this application increase the potential for damaging cavitation and erosion.

Control valves commonly used in this application utilize some manner of anti-cavitation trim. Most of these trims, however, utilize small passages that can be exposed to plugging and erosive effects. The injection valves used in an offshore platform in Thailand, for example, utilized a torturous path construction to address the cavitation potential. The valve trims were not designed to pass entrained particulate, however, or to withstand the erosion inherent in the process. Needless to say, in a short time, the damaged trim rendered the valves useless.

To address these severe-service issues, maintenance personnel on the platform installed Dirty Service Trim (DST) from the Fisher Valve Division. DST is specially designed to eliminate the formation of damaging cavitation while allowing particulate up to 3/4-inch in diameter to pass through. By utilizing large-diameter holes

and passage shapes, DST eliminates the potential for localized, high-velocity erosion. Fisher® valves with DST trim also incorporate a protected seating feature to promote long-lasting tight shutoff.

DST has been used successfully on hundreds of water-injection applications. Because of its proven success, the Fisher-DST solution would be an excellent choice for other platforms with recurring cavitation or erosion issues.



HPASR “ELEPHANT” VALVE EQUALIZES STEAM TURBINE PRESSURE

A turbine OEM in New England called Fisher's Engineered Products group with an unusual application and safety issue. They had a large, 48-inch turbine bypass valve in place to divert or “vent” up to 1000 psi of steam pressure. Atop it was a much smaller valve whose sole function was to permit the larger valve to open and close during an emergency trip.

The customer had been making the small equalizer valve in-house, and the valve was leaking. Plus, they realized that if the smaller valve failed to do its job on demand, the result could be millions-of-dollars damage to the steam turbine.

They needed a control valve expert and an engineered solution to reduce costs, improve safety, and provide better control of this steam turbine service. Wisely, they sought help from Fisher engineers, who set to work, modifying an existing valve design. The end result was an unusual push-down-to-open valve called an HPASR.

The construction and installation of the two-inch HPASR equalizer valve proved a particular challenge.

- The valve had to meet tough pressure drop and capacity requirements. Its inlet is rated for ANSI 1500, and its outlet is ANSI 600.
- The valve would be bolted to existing piping and had to be an “exact fit” in the small space occupied by its predecessor. Mounted in a tight space atop the big valve, the HPASR

valve required an “elephant-trunk-like” ANSI Class 600 RF (raised face) outlet.

- Because the valve was difficult to install and access, designers made it easy to maintain. The trim may be removed through the bonnet.

The customer considered the valve's price a bargain and has been very satisfied with its performance.

Fisher now offers three different HPASR valve designs in 4-inch, 2-1/2 inch, and 2-inch sizes. Fisher has sold more than 300 of these small but critical valves.

