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LNG FACILITY PLACES ORDER WITH FISHER TO SOLVE ANTISURGE NEEDS

A liquefied natural gas facility in Brunei recently ordered Fisher-Optimized™ compressor antisurge systems for its five production trains. Representing a total of 25 severe service control valves, the Fisher solution replaces the entire antisurge system within each of the plant's propane and mixed refrigerant compressor trains. The 5.5-ton per annum facility turned to the Fisher-Optimized solution because of Fisher's proven and unmatched ability to meet the stringent performance criteria required in antisurge control.

The order includes 12" through 30" valves (Figure 1) that utilize WhisperFlo™ noise abatement trim, which is custom designed to the requirements of each specific application. WhisperFlo is a multi-path, multi-stage noise abatement technology that can reduce noise by up to 40 dBA, surpassing conventional noise trims by 10 dBA.

Figure 1: 30" Propane Compressor Antisurge Valve

The ability to custom-characterize the WhisperFlo trim optimizes the valve size, thus minimizing the required downstream pipe size. The WhisperFlo trim also incorporates a spoked valve plug design that eliminates the potential for axial and radial vibration common to large valves equipped with traditional, balanced trim constructions

The Fisher-Optimized antisurge system with its high-speed actuation and extremely accurate positioning capability offers an extensive lineup of operating advantages, including:

- Improved Dynamic Response & Robustness – Antisurge valves must open in less than two seconds, and they must also be accurate to provide closed loop control. With the Fisher-Optimized patented feedback technology, the valves can respond quickly to large and small amplitude signals without overshoot while maintaining linearity within 0.75% of the controlling signal.
- External Accessories Dramatically Reduced – A typical antisurge valve may have 10 to 15 boosters and quick-exhaust valves. The Fisher-Optimized antisurge solution reduces the accessory count by at least 50% and greatly simplifies pneumatic adjustments in the field. All of this is accomplished without compromising the stroking speed of the valve.
- Air Cushioned Actuators – In fast stroke situations when a heavy valve plug moves quickly from one travel stop to another, there is potential for damage to both the valve plug and actuator. The Fisher-Optimized actuator assembly features air cushions in the actuator that engage the piston to provide a controlled deceleration into the either stop.
- Reduced Commissioning Time – With traditional antisurge systems, one can expect to spend at least 12 hours in tuning one valve in the field. With the Fisher-Optimized system, field-tuning time is reduced to less than 15 minutes per valve.
- Online Performance Diagnostics – Being critical pieces of equipment, antisurge valves should be monitored to ensure that they are operating within designed specifications. With the Fisher-Optimized system, diagnostic information can be collected, viewed and analyzed without shutting down the valve or disturbing the process. A red, yellow or green light indicator in the valve's digital controller identifies potential problems. If an alert is triggered, the problem, its potential causes and recommended corrective actions are displayed.

All of these factors added up to a more reliable solution for the LNG facility operators as they looked to further extend the plant's operating life. The latest in noise abatement, vibration control, actuation technology and online diagnostics provided by the Fisher-Optimized antisurge system give peace of mind that the valves will perform when called upon in an

upset condition.

DIRTY SERVICE TRIM HELPS NUCLEAR PLANT AVOID $150,000 IN NEW VALVE COSTS -

Several years ago, a New England nuclear power plant was in the process of going through a unit uprate, but was having difficulty getting the necessary capacity from its condensate recirculation valves. These valves recirculate a minimum amount of flow through the condensate pump back to the condenser hot well, both to prevent the pump from overheating and to avoid the formation of damaging cavitation. Because the downstream pressure from the condensate recirculation valves is at a vacuum, the potential for damaging cavitation and flashing is present.

At first glance, it appeared that three 8" valves would have to be replaced in favor of larger valves to achieve the desired capacity. However, Fisher proposed a retrofit trim to be installed into the existing valves that would provide the necessary capacity as well as protection against cavitation and flashing. The solution consisted of three- and four-stage dirty service trim (DST) packages.

The DST solution is a patented, multi-stage anti-cavitation trim used in services where the fluid may have entrained particulate that could plug the flow passages in conventional anti-cavitation trim. The trim incorporates wide-open flow passages that can pass particulate up to ¾" in diameter.

While this application did not require DST from an entrained particulate standpoint, it benefited from the trim's open flow passages, which provide more capacity than a conventional anti-cavitation design.

The DST solution also incorporates a protected seating feature that helps to provide long-lasting, tight shutoff. Since these valves are normally closed, the tight shutoff capability eliminates excessive pumping requirements and subsequent trim damage.

By retrofitting the existing valves, the plant avoided over $150,000 in new valve costs. Retrofitting the valves also eliminated a fair amount of paper work required when valves are removed and new valves installed.

KCP&L IMPROVES HEAT RATE 4% BY REPLACING SUPERHEATER BYPASS VALVES

Kansas City Power & Light's (KCP&L) LaCygne #1 generating station was looking for opportunities to improve plant performance. The investigation led to four existing superheater bypass valves – three BW-202 valves and one BW-207 valve – that were leaking badly. The downstream flash tank pressure during normal plant operation was registering over 600 psig, when it was intended to operate between 50 to 100 psig. Plant managers estimated that they were losing 10 to 12 megawatts due to leakage alone.

The BW-202 and BW-207 experience some of the most severe operating conditions in a supercritical power plant. The valves are required to pass cold water initially, then hot water and eventually steam. During these operating phases, the valve can be exposed to damaging cavitation and flashing as well as extremely high temperatures. For optimal performance, each of these potentially harmful effects must be mitigated to avoid piping vibration, extended startup times and reduced efficiency of the unit.

With a performance improvement plan in mind, the plant managers approached Fisher Severe Service personnel to develop a solution. To address the potential for damaging cavitation and subsequent damage, 8" valves (Figure 2) were provided and installed with a characterized Cavitrol® III solution. The four-stage trim addresses damaging cavitation and flashing during initial operation while also providing the necessary capacity required as flash tank pressure builds. The valves also possess enough capacity to bypass flow to the flash tank in the event of boiler over-pressurization.

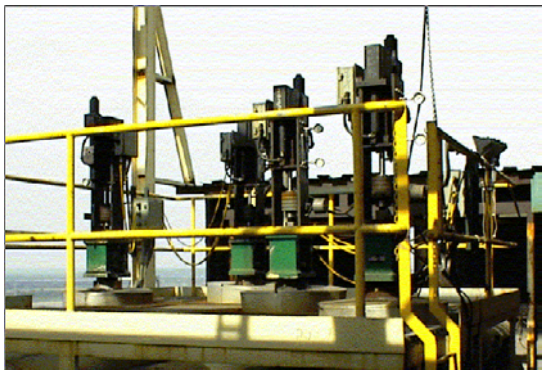

Figure 2: KCP&L Superheater Bypass Valves

To provide tight shutoff, the Cavitrol III trim was fitted with the proven C-seal construction. C-seal is a balanced trim construction designed specifically for applications where temperatures can approach 1100 degrees Fahrenheit.

After installation of the four valves, the flash tank pressure dropped from 600 psig to 75 psig; the feedwater pumping load reduced by 10 percent: and the plant reported estimated savings of $275,000 in excess pumping costs. In addition, the plant's capacity has increased by 15 to 20 MW. These new valves, in combination with several other modifications, have allowed the plant to reduce the overall heat rate by four percent – saving more than $4 million dollars each year.