



For **Severe Service** Control Solutions, Turn to Fisher Technology and Innovation

## KANSAS CITY POWER & LIGHT 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 process led to four existing superheater bypass valves – three BW-202 valves and one BW-207 – that were leaking badly. The downstream flash tank pressure during normal plant operation was over 600 psig, when it was intended to operate in the 50 to 100 psig range. Plant managers estimated that they were losing 10 to 12 megawatts due to valve leakage alone.

The BW-202 and BW-207 valves 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 super-heated steam. During these operating phases, the valves may 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, longer startup times, and reduced efficiency of the unit.

With a performance improvement plan in mind, the plant managers approached the Fisher Severe Service group to develop a solution. To address the cavitation issue and avoid subsequent damage, 8-inch Fisher® valves were provided and installed with a characterized Cavitrol® III trim solution. The three-stage trim minimizes 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.

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 Fisher 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 increased by 15 to 20 MW. These new valves, in combination with several other modifications, allowed the plant to reduce its overall heat rate by four percent – saving more than \$4 million dollars each year.

For more severe service solutions see us at [www.fishersevereservice.com](http://www.fishersevereservice.com).

C-Seal is a mark owned by Pressure Sciences, Inc.

