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## **SARGENT & LUNDY TURNS TO FISHER SEVERE SERVICE GROUP FOR SKY VENT SOLUTION THAT REDUCES NOISE, VIBRATION, AND COSTS**

One of the most challenging control valve applications within a combined cycle plant involves what is commonly referred to as the sky vent. The valve in this application controls the ramp rate of the heat recovery steam generator (HRSG) to protect it from thermal induced stresses. The valve releases steam to atmosphere during startup and shutdown and is required to withstand full process pressure.

With inlet pressures as high as 1950 psig dropping to atmospheric pressure across the sky vent valve, there is the potential for excessive noise and damaging vibration. To combat this, most solutions incorporate a control valve equipped with noise attenuating trim along with a diffuser or downstream silencer.

Engineering firm Sargent and Lundy recently designed a combined cycle power plant to be located in Corpus Christi, Texas. A particular issue concerned stresses on the piping systems, which prompted use of the smallest size possible downstream silencer in the sky vent application. The tradeoff to this answer, however, was that nearly all of the 1950 psig inlet pressure had to be reduced in the control valve, with a very high potential for excessive noise and vibration.

The Sargent and Lundy design engineers determined that a 6-inch valve would satisfy capacity and pressure control needs, although it would create an undesirably high outlet velocity. Operating temperatures up to 1065 degrees Fahrenheit added to the problem. At first pass, it appeared that a 24-inch valve could be the answer, albeit a costly one requiring an ANSI Class 2500 valve body in C12A material.

The Severe Service group within the Fisher Valve Division reviewed the sky vent application and proposed a valve alternative that would solve the noise/vibration and cost dilemma. The solution incorporated a 6-inch, pressure-balanced valve equipped with a Whisper Trim® III noise attenuating flow cage, along with a downstream 6x24-inch diffuser. This combination staged the pressure drop between the control valve and the downstream diffuser, a technique that met the pressure and noise control requirements as it minimized the control valve's size.

While the smaller valve size gave immediate cost savings, the Fisher solution also provided savings in piping costs. Sargent and Lundy engineers avoided having to redesign the piping and piping support systems, and by using a smaller valve size, minimized the amount of large piping required to connect the valve to the downstream silencer.

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