



Reheat Damper Upgrades Improve Boiler Efficiency

JEA Generating Station
Florida U.S.A.

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- Frank Thomas

Maintenance and Reliability Engineer

A JEA power station, which operates two of the largest Circulating Fluidized Bed (CFB) combustors in use, recently completed a plant upgrade to improve efficiency and reduce maintenance costs. A large part of this project focused on improving steam temperature control. Beck high torque 22-409 actuators were installed on the critical Reheat damper applications to provide the precision and reliability required.

The plant was experiencing inefficiencies in boiler heat rate resulting from poor steam temperature control. This control was a result of the sluggish and imprecise response from the pneumatic actuators being used to modulate the boiler Reheat and Superheat dampers. The boiler at this facility maintains a steam temperature of 1000°F which is controlled by these dampers. Unfortunately, poor response from the pneumatic actuators that were originally installed on these applications caused temperature swings of approximately $\pm 20^{\circ}\text{F}$. The control capabilities were so dismal that the plant operators had been operating the control loop in manual. In addition, during unit startup, the Superheat dampers were left fully open and the Reheat dampers were manually controlled to maintain the steam temperature as close to set point as possible. This was clearly not an acceptable control scenario.

Poor steam temperature control can lead to a variety of control, maintenance and efficiency problems. Controller tuning and maintenance alone are significant issues that required constant monitoring at the plant. Plant personnel calculated that excessive temperature swings of $\pm 10^{\circ}\text{F}$ equated to additional costs of approximately \$50,000 per year and that swings of $\pm 20^{\circ}\text{F}$ equated to approximately double or \$100,000 per year. For this reason,

the plant needed to improve control and did so by replacing the pneumatic actuators. JEA was already familiar with Beck actuators since they had previously been installed at a sister facility. The precision and quality were considered excellent so Beck was selected again.

Although the installation was part of a Reheat and Superheat upgrade project, the Reheat dampers were the only critical steam temperature application initially retrofit with Beck 22-409 actuators. The Superheat dampers were left alone and control remained solely the



Figure 1

22-409
Beck actuator
connected to an
industrial damper

responsibility of the Reheat dampers. The results of this project are regarded as excellent. Temperature swings have been reduced to less than $\pm 5^{\circ}\text{F}$ and overall control has been improved. Frank Thomas, a Maintenance and Reliability Engineer with JEA, commented that ***“Without the precision and reliability of Beck actuators, we would not be able to operate the Reheat dampers in automatic control”***. The operators now have the confidence to leave the control loops in auto; while previously, they were left in manual with the pneumatic actuators installed.



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