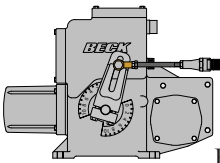
BECK® Electric Actuators for Industrial Process Control

Precise and Reliable PA Damper Actuators have been Improving Automatic Load Dispatch Response at a JEA Generating Station for Over 10 Years



Saint Johns River Power Park - JEA, Florida U.S.A.

Dave Lott (I&C Manager)

Electric utilities must regulate power production in response to changing demand. The ability to do this rapidly and efficiently is a valuable asset that requires precise, efficient boiler combustion control; however, obtaining the requisite control can be a challenge, even at steady state. Fuel and combustion air flow are controlled by modulating a variety of fans and dampers, and without actuators capable of positioning the dampers precisely, it is impossible to achieve the precise combustion control required for automatic load dispatch.

In the case of SJRPP, Jacksonville Electric Authority's (JEA) premier coal-fired power station, the upgrade to the Beck 11-409 damper drives resulted in significant improvements in combustion control insomuch that SJRPP is normally available for automatic dispatch of up to 800MW for JEA's system dispatcher.

Dave Lott, manager of I&C at SJRPP reports: ***"In our fuel delivery system, we pulverize coal and use Primary Air (PA) to blow the pulverized coal into the boiler combustion box. Thus our PA dampers are the "throttle" that controls the immediate fuel delivery to the boiler. Since we replaced our original PA Damper actuators with Beck actuators, we now have precise control of PA flow through each pulverizer thus delivering fuel to the boiler. Also important is the reliability that we have experienced with our Beck actuators. The reliability and precise control that is inherent to our Beck actuators is crucial to our ability to be automatically dispatched. Our original actuators needed too much maintenance and had too much gear slop for us to achieve reliable boiler control."***

SJRPPs original PA Damper actuators had the common electric actuator design, which incorporated an induction motor and worm gear. This typical design is subject to thermal limitations caused by the motor's high in-rush current that occurs every time the motor starts. This characteristic limits the resolution of the actuator and also limits duty-cycle. Wide dead band is a necessary evil that limits modulation and precision in order to prevent thermal trips of the actuator. In SJRPP's case, these actuator limitations caused severe pressure excursions during load changes, which forced the station to operate the boiler control in manual. Station personnel determined that the actuators did not respond to a demand signal within a 5-10% dead band as shown in the figure below. They blamed the poor performance on slop in the gears.

The station opted to install Beck damper drives for the PA damper applications because Beck drives are designed to provide precise control and modulate continuously without any duty limitations. In addition, because Beck drives are specifically designed for modulating control, they can consistently make step changes as small as 0.1% of span. The installation of Beck drives on the PA dampers and other coal mill modifications has drastically improved control.

SJRPP installed the Beck actuators on their PA Dampers in 2001, retuned their boiler, and now have over a decade of proven reliability in the ability to be automatically dispatched.

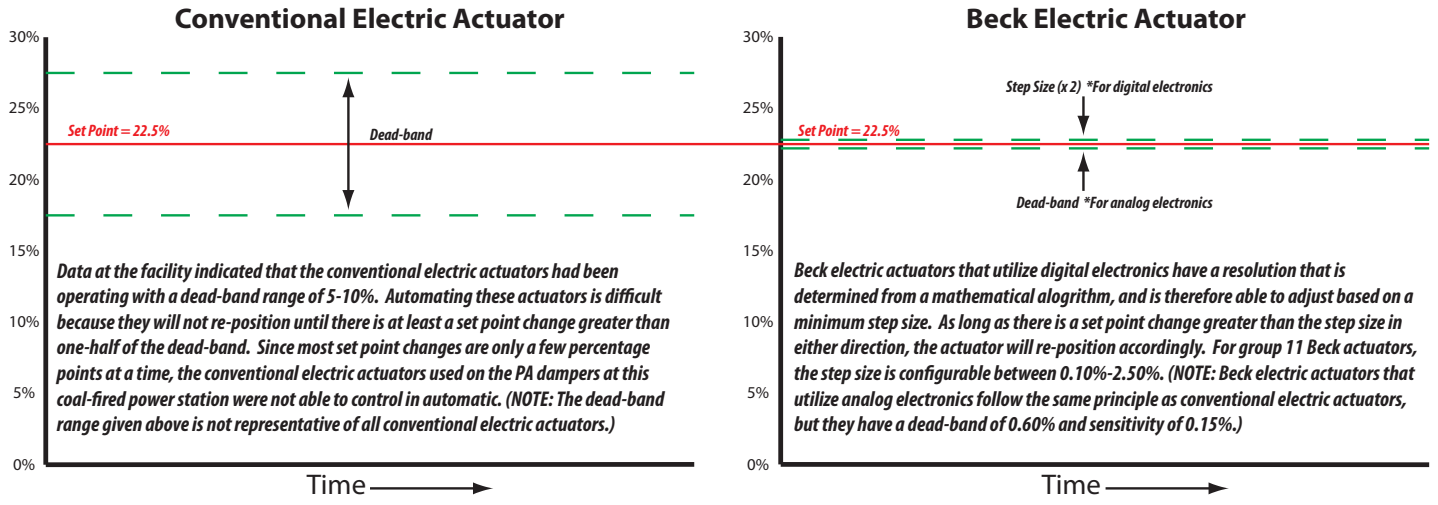


Figure 1 - Conventional vs. Beck Actuator Resolution

BECK VIDEO Scan W/ Smartphone

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