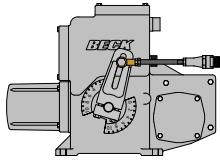


## Actuators on Aeration Blower Valves Improve Dissolved Oxygen and Increase Overall Process Stability



*City of Stuart Water Reclamation Facility - Stuart, FL*

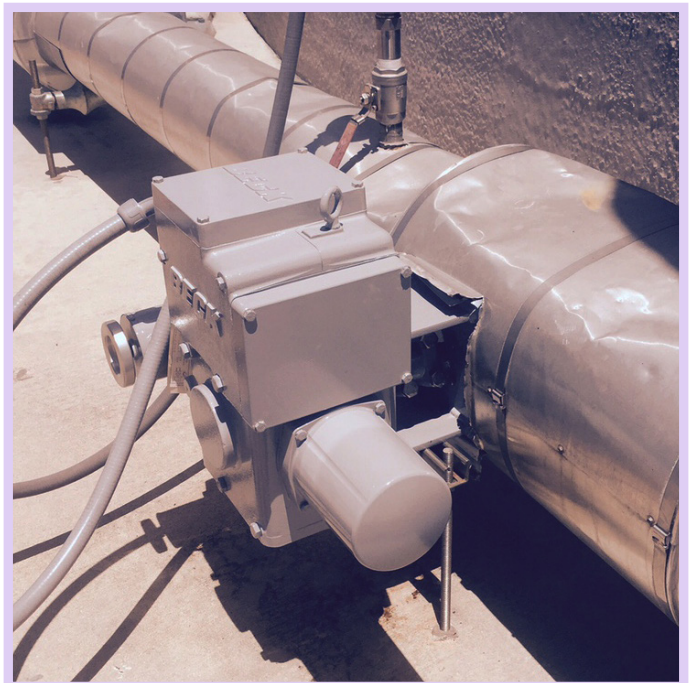
The City of Stuart Advanced Water Reclamation Facility is a wastewater treatment plant that produces near-potable, reclaimed water for irrigation uses in South FL. The plant was built in 1955 and most recently upgraded in 2011. The treatment process includes a Dissolved Oxygen System with (3) Aeration Basins. Installing Beck electric actuators on the aeration blower control valves has improved process stability and plant operations.

Dissolved oxygen (DO) content in the basins is controlled by measuring the DO concentration and then modulating the aeration flow control valves to maintain the ideal setpoint. Good control is critical to keeping the treatment process stable thus optimizing throughput and chemical usage. Each of the plant's three aeration basins has its own aeration control valve, and the ability to control the basin DO is a function of how well each of these valves can be modulated. Historically, the plant used conventional electric actuators to modulate the Aeration control valves, but suffered from DO concentration swings, often to unacceptable levels especially under certain treatment conditions.

Conventional electric actuators utilize a squirrel cage induction motor design. As the plant personnel came to realize, this can be problematic when used for modulating control. The large inrush current and resulting temperature rise typical of this motor type limits actuator duty (Figure 3). To avoid thermal trips, motor damage and actuator wear the starting and run activity of the motor must be limited. To limit modulation of the aeration valve actuators at the City of Stuart plant, personnel widened the actuator dead band settings.



**Figure 1 - BEFORE**  
*Conventional Electric Actuator*



**Figure 2 - AFTER**  
*Beck Electric Actuator*

Although this reduced their activity, it also reduced control resolution and performance increasing DO variability and decreasing process stability.

To improve both control and reliability, plant personnel decided to replace the conventional electric actuators with Beck actuators. In comparison, the Beck actuators utilize a NO-burnout motor and have no limitations on motor starts. They can modulate continuously without duty-cycle limitations and provide unmatched control performance. The unique, time-proven Beck design provides exceptional positioning, repeatability, and reliability without worry and without dead band adjustments. Further, no periodic maintenance is required.

Thanks to Beck actuators on the aeration control valves the plant is now able to control the DO much closer to set-point with minimum variation, even during large flow changes that occur in events like storms. The improved process stability has also reduced the wear and tear on other mechanical equipment while optimizing chemical addition. The improved valve positioning, especially during changes in the plant input flow, has allowed the facility to maintain DO set-point using fewer blowers and saving on electricity.

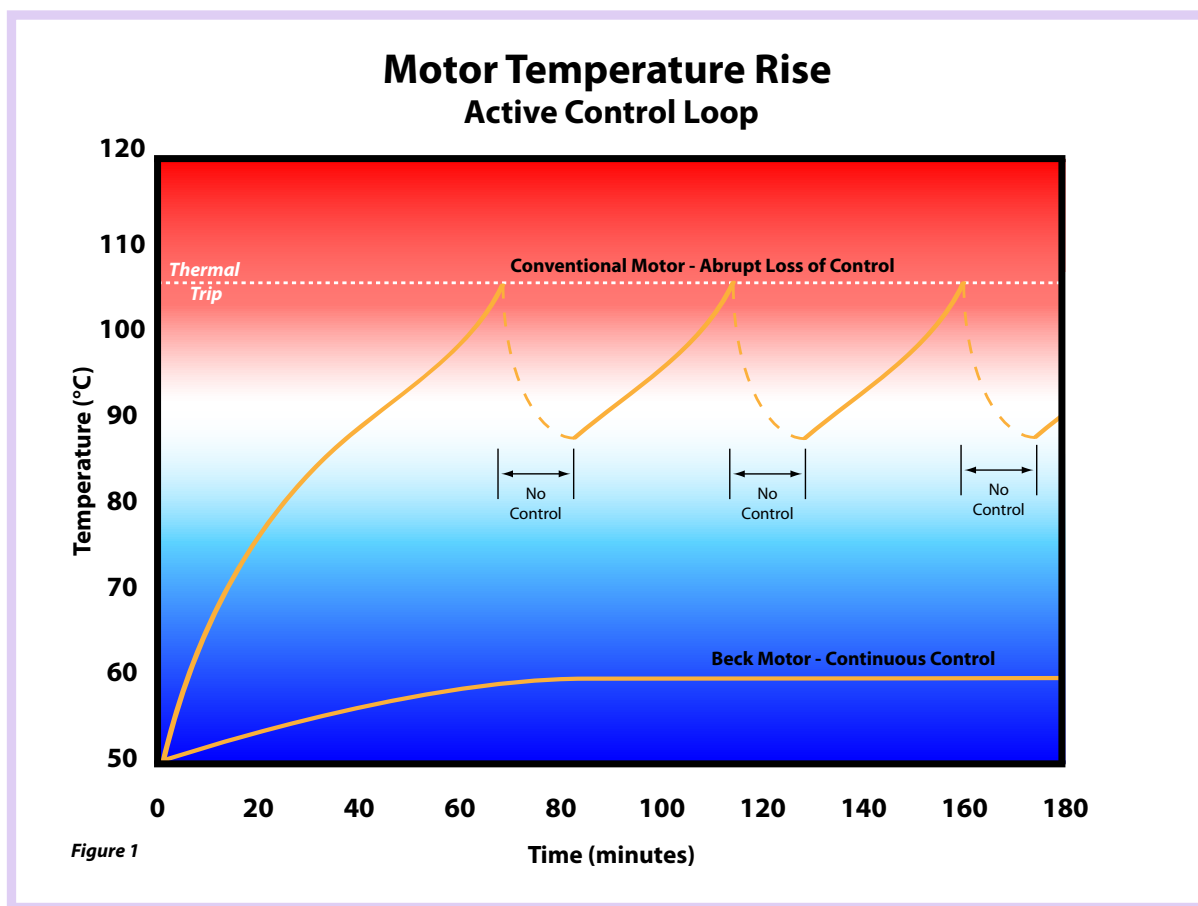


Figure 3



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