

Reverse Osmosis Valve Upgrades Generate \$18,000 / month in Additional Revenue

City of Port Saint Lucie - Prineville RO WRP, FL U.S.A.

The Port St. Lucie Prineville Reverse Osmosis (RO) Water Treatment Plant has been supplying drinking water to the area since 1998. The RO equipment has a capacity of 11.15 MGD with 5 Membrane Skids. Replacing conventional electric actuators with Beck on the feed and membrane valve on one skid yielded significant benefits:

3% Recovery Improvement with Beck Actuators

3% Recovery Improvement = 171,000 Additional Gallons / Day of Water to be Sold

171,000 Gallons / Day x \$3.78 / per 1000 Gallons = \$646 / Day

\$646 / Day x 28 Days / Month = \$18,088 / Month of Additional Revenue

Each membrane requires a modulating feed valve and a modulating concentrate valve. The positioning performance of these valves is critical to the removal of water impurities and the fresh water recover rate. The performance of the original conventional electric actuators degraded over time causing membrane recovery to drop from 80% down to 77%. The conventional electric actuators used a multi-turn, squirrel cage motor to operate an external gear-head to position the quarter turn ball valves. This type of actuator is commonly used because they are economical, and therefore supplied as part of a system. Unfortunately, the inherent duty-cycle limitations and reliability issues typical of these actuators cause problems on modulating applications like the membrane feed and concentrate valves. Due to the inrush current and a high temperature rise, squirrel cage induction motors have a propensity to overheat on active control loops, and they can eventually burn out (Figure 1).

In comparison, the Beck actuator utilizes a NO-burnout motor that instantaneously transmits force through a high-efficiency spur gear train. This design provides exceptional positioning and repeatability, along with improved reliability. Further, no periodic maintenance is required.

In addition to the revenue generated by additional water sales, the plant reported savings from reduced chemical

usage and lighter pump loads. Also, the Beck actuators have not required any service or maintenance since installation when compared to the previous electric actuators that required periodic maintenance just to keep them operating.

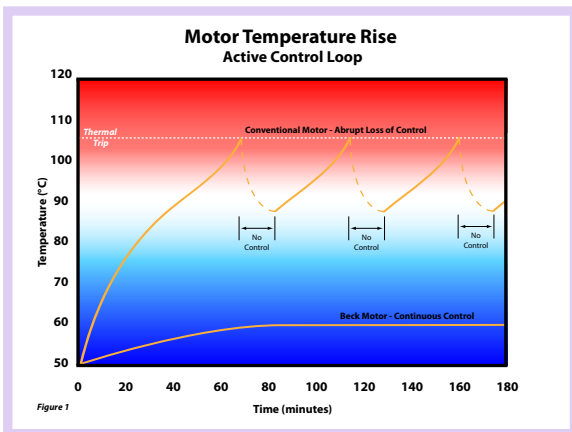


Figure 1

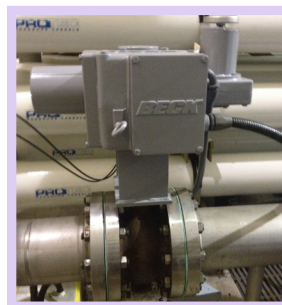


Figure 2
RO Feed Valve



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