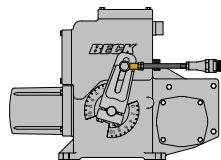


## Prolonging Equipment Life in a WWTP can be accomplished by using More Reliable Actuators on the Ducking Skimmer Scum Troughs



North Carolina U.S.A.

In 2011, the City of Durham's North Water Reclamation Facility (WRF) identified an opportunity to improve reliability and reduce maintenance costs associated with their ducking skimmer scum troughs by replacing the multi-rev electric actuators with Beck rotary actuators. Scum troughs remove sludge from the surface of the feed water and are integral to most primary, secondary and final clarifiers. Traditionally, a rotating scum trough, used with ducking skimmers, is controlled by a multi-rev electric actuator and worm gearbox. This equipment is usually mounted above on a walkway bridge and is connected to a lever arm on the scum trough with an acme screw. This method of torque transmission to the scum trough is inefficient and degrades over time. This natural degradation is caused by wearing of the soft brass stem nut that all worm gearboxes contain. As the softer brass metal wears, the efficiency reduces thereby restricting the torque delivered to the scum trough. Additionally, the acme screw naturally tilts side to side as the scum trough lever arm is rotated during operation. This induces side-loading forces on the brass stem nut, which accelerates its rate of failure. These factors often lead to motor stalling and eventual burnout in traditional electric actuators. Aside from accumulated repair and labor costs, frequent problems with scum trough actuators can lead to grease and sludge buildup in downstream pumps and equipment, as well as reduced clarifier capacity.

As part of a plant upgrade, several old Beck actuators (1991) were replaced in kind, which left the plant with some functional spares. As a trial,



Figure 1

Beck 11-303 Rotary Actuator

the North Durham WRF installed a Beck 11-303 rotary actuator on a secondary clarifier scum trough. The Beck actuator was installed in the same location as the previous actuator, but a pipe linkage kit was used to connect the scum trough lever arm to the Beck crank arm. The retrofit was extremely straight forward and the actuator has performed flawlessly. Trouble-free operation can be attributed to the durable Beck design and 100% continuous duty, no burn-out motor.

Improved scum trough control is expected to maximize long term clarifier capacity and limit the amount of grease and sludge that makes its way to downstream equipment. Prevention of one pump repair or refurbishment can justify the retrofit cost to use a Beck actuator, not to mention the reduced repair and labor costs associated with fixing traditional electrics.



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