Scotch Yoke Actuator Improves Uptime in High Cycle Applications

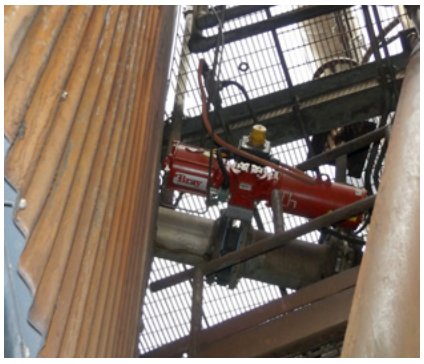
KEY RESULTS

- Actuator performed >700,000 cycles with zero leakage[1].
- Greatly increased operational uptime and profitability.
- Eliminated costly shutdowns for actuator replacement.
- S98 Scotch yoke automated valve packages became preferred choice for high-cycle applications.

APPLICATION

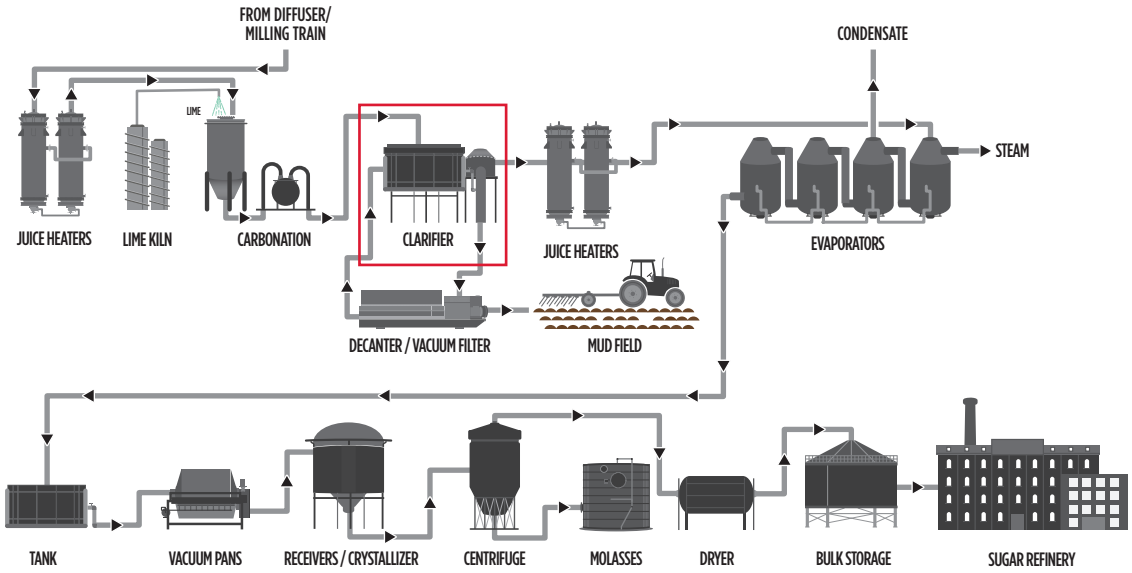
Complete valve and automation package for mud clarifiers at one of the largest sugar refiners in the United States.

During the demanding sugar refining process, clarifiers are used to separate out the solids suspended in the juice. These solids originate from the fibrous raw plants that have clinging sand attached. Clear juice flows off the top part of the vessel, while clumped masses of impurities, called muds, settle at the bottom. Switching valves remove the mud and juice from the clarifiers, and often undergo very high cycles during a sugar campaign/season — which puts high stress, wear and tear on the components.



Bray S98 automated switching valve package used in mud clarifier process.

TYPICAL SUGAR PROCESSING APPLICATION



CHALLENGE

The demanding sugar refining process puts valves, actuators, and controls through harsh conditions, such as dust, dirt, humidity, rain, and ultraviolet rays — making it essential that the valves and actuators supplied are capable of withstanding the tough conditions.

One of the largest sugar refiners in the United States — a Bray customer — has been using our Series 41 high performance butterfly valves in their facility. The valves have served their needs well, but were being actuated by a competitor's product, which was repeatedly failing. A variety of production-halting problems plagued our customer's actuator: sealing failure, bearing wear-out, spring breakage, loss of spring tension, mounting and drivetrain component failure, and fatigue failure. The high-cycle environment (cycling every 55 seconds) demanded higher reliability for sugar processing — uninterrupted valve and actuator operation for up to 350,000 cycles.

BRAY AUTOMATION PACKAGE

Application	Switching valves on mud clarifiers
Valve	S41 High Performance Butterfly Valve (8 and 10 inch)
Actuator	S98 Pneumatic Scotch Yoke Actuator (12E2)
Accessories	S5A/S5B Valve Status Monitor
Performance	Over 700,000 cycles with Zero Leakage[1]

SOLUTION

The actuators previously being used apparently could not meet minimum requirements for endurance, mandated by actuator standard EN-15714-3. Based on the quality and success of the installed Bray valves, our customer replaced seven of their existing actuators with Bray Series 98 pneumatic scotch yoke actuators.

The switching valves for the mud clarifiers were now a complete Bray solution — high performance butterfly valves with pneumatic scotch yoke actuators and valve status monitors.

RESULTS

The Bray actuators performed continuously for the entire duration of the sugar campaign, which lasts up to 10 months. Previously, the client had experienced costly production shut downs from leaking actuators — **but Bray's actuator, after nearly double the operational time, had zero leakage** — resulting in no production shut downs.

After accumulating **more than 350,000 cycles**, inspection results showed that the Bray actuators met all operating challenges without any performance degredation — **far exceeding all expectations**. With routine maintenance during the off-season, the Bray S98 actuators were placed back into service, and performed another 350,000 cycles — **totaling more than 700,000 cycles without failure**.

The customer has ordered seven more actuators for their next production season, doubling their total purchase of the Series 98 pneumatic scotch yoke actuator. In addition, they have started replacing competitor switchboxes with Bray S5A & S5B models. With over 50 competitor actuators remaining, the customer intends to replace them, as they fail, with complete packages of Bray actuators and switchboxes.

Bray automation solutions performed continuously for more than 700,000 cycles in the harsh sugar processing environment.

For information on the S98 actuator, or our full line of flow control solutions, visit BRAY.com

NOTE

1 Routine maintenance performed during off-season.