

DeZURIK RCV ROTARY CONTROL VALVE IN SODIUM BORATE PRODUCTION

APPLICATION & HISTORY:

A mine was experiencing routine production upsets in a sodium borate process due to a competitor's failing tapered plug control valve. This vacuum feed control valve has a critical function of controlling the feed of liquor to hydrocyclones that contain 10% suspended borate crystals at 145°F (63°C) at 30 psi (200 kPa). In addition 150 psi (1030 kPa) steam is continuously fed to the line to prevent crystallization from prematurely forming which can plug the piping, the control valve and final processing equipment.

The vacuum feed control valve is required to provide accurate flow control to the hydrocyclones that dewater the liquor. The separated water is transported to another process while the borate crystals continue to a vacuum belt and dryer.

Over time crystals would form between the seat and the seal in the 8" (200mm) tapered plug vacuum feed control valve. The valve's response to commands would range from sluggish to severe stiction, resulting in poor control of the process.

Another function of the control valve is to shut off in the event of upset or malfunction in the dryer or hydrocyclones. A seized tapered plug valve failed in this duty causing an overload of liquor in the system. Congealing and solidifying liquor clogged the piping, hydrocyclone manifolds and other downstream equipment, resulting in prolonged downtime and production loss.

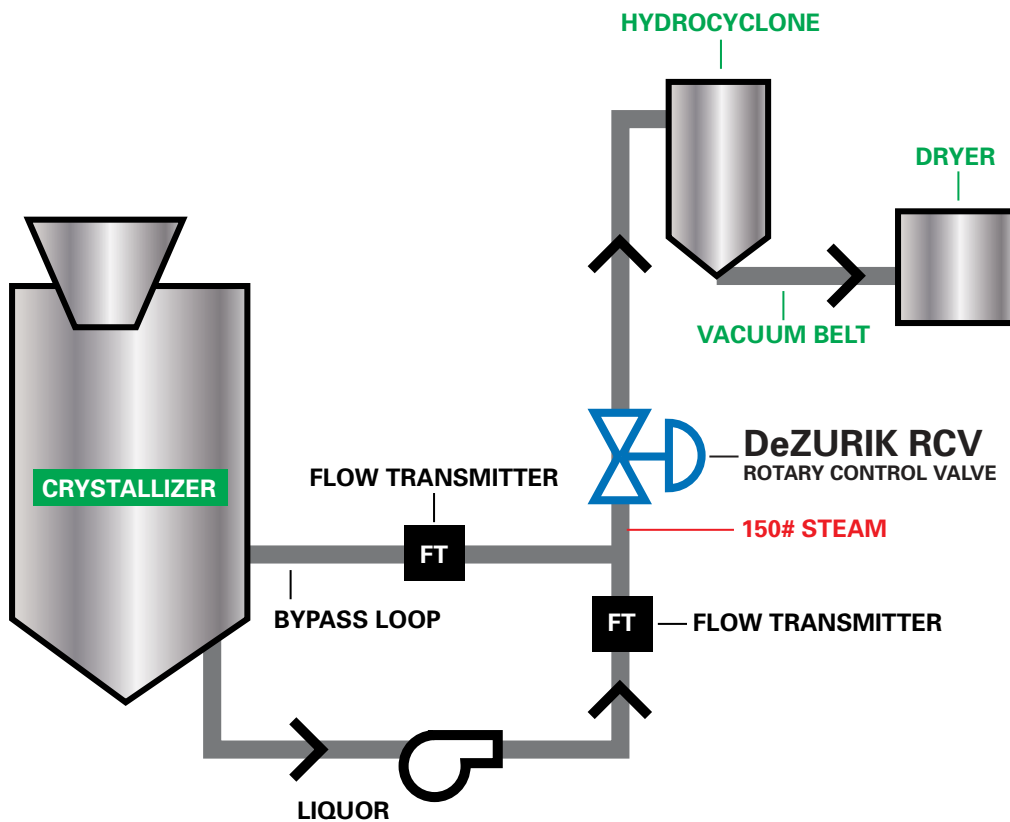


SOLUTION:

DeZURIK provided a solution with a DeZURIK RCV Rotary Control Valve with stainless steel trim. Installed in the flow-to-close direction, the 8" (200mm) DeZURIK RCV valve with high capacity trim replaced the tapered plug valve that was failing in less than four months. The DeZURIK RCV eccentric action of the plug, clear flow passage (non-cross over shaft design), prevents the formation of crystals in the trim and valve body. Speed of response and accuracy resulted in improved production outcomes. The DeZURIK RCV is now in its third continuous year of accurate control of borate liquor in the crystallization process.

When maintenance and repairs of the hydrocyclone, vacuum belt and dryer are needed, the DeZURIK RCV shuts on demand and creates a bypass loop with the crystallizer. The resultant mass balance causes the liquor temperature to approach the saturation temperature of the steam. The self-aligning class IV orbital seat maintains a good seal in this bypass mode, and opens quickly when the process resumes production.

The mine realized a reduction in maintenance costs, reduction in liquor waste, and increase in operating efficiency. DeZURIK's RCV valve provided a solution that helped improve this mine's bottom line profitability.



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