

Major Oil Refinery Saves \$100K USD on Maintenance & \$2 million USD on Downtime Costs with Fisher™ V500 Eccentric Plug Valve

RESULTS

- Reduced the frequency of unplanned shutdown by 15 days a year, saving more than \$2 million USD on production loss
- Improved process control and throughput, with an upgraded version of Fisher V500 Eccentric Plug Valve combined with Fisher™ FIELDVUE™ DVC6200 Digital Valve Controller, resulting in a savings of \$100,000 USD on maintenance costs
- Enhanced plant safety and reliability by eliminating valve passing issues with Very Tough Ceramic (VTC) trim set and carbide coating on the internal valve body surface



APPLICATION

Main Column Pump-Around Control Valve located at Residue Fluid Catalytic Cracking (RFCC) Main Fractionator Unit

It is used for crucial reflux to control the heat balance of the fractionator, improving product separation and yield. Optimal valve performance is essential to maintaining consistent product quality, underscoring the importance of reliability and operational excellence in this application.

CUSTOMER

Major public sector refinery in India

CHALLENGE

Due to severe erosion issues, the valve opening gradually reduced over time while operating in online control mode. This reduced valve opening led to an increased rate of velocity erosion on the trim and body cavity. Erosion-induced thinning of the body thickness resulted in external leaks from the body, posing a significant safety hazard in the customer's operational environment.

"The recently installed Fisher V500 eccentric plug valve, equipped with ceramic internals, is effectively preventing internal damage in the CLO service project and continue to perform satisfactorily."

Plant Senior Instrumentation Manager

CHALLENGE (continued)

Control valve leakage in the pump-around circuit of the column bottom of the RFCC unit was discovered on a night shift, and consequently, the throughput was reduced. This was reported as a near miss that could have resulted in a catastrophic fire.

The valve typically caused problems every three months, leading to production loss and unplanned shutdowns. Severe erosion was observed in the trim and the body flange when the control valve was dismantled. This severe erosion was unexpected as the control valve had only been operating for a short time.

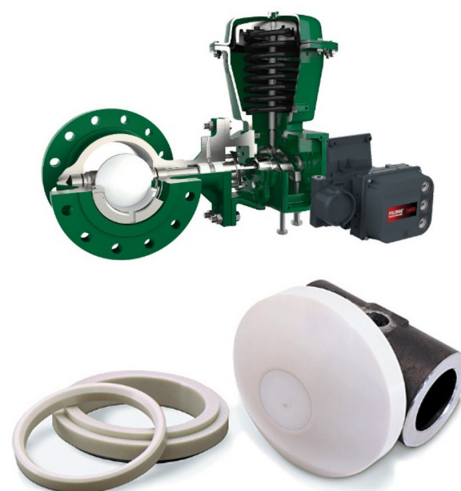
SOLUTION

The reported leaking valve was a Fisher V500 eccentric rotary plug valve, which is intrinsically capable of handling erosion and controlling hard-to-handle fluids. It is field-proven in handling rugged components and providing application versatility in several industries since being introduced in 1984. Nevertheless, after an in-depth assessment, Emerson's field experts found that the higher-than-projected erosion rate at the valve trim was due to catalyst fines in the Clarified Oil (CLO) line. The greatest erosion was discovered at the valve trim and outlet body flange, both located close to the vena contracta point of the flow path.

To address this erosive and dirty service application issue, the Emerson team recommended upgrading the customer's Fisher V500 eccentric rotary plug valve with the proprietary VTC trim set and tungsten carbide coating on the internal body surface. This combination enhances the durability and performance of the Fisher V500 eccentric plug valve. The VTC trim is a robust and stable ceramic resistant to thermal shock and valve trim erosion, while the carbide coating provides a layer of protection against valve body erosion.

Emerson's solution also included a Fisher FIELDVUE DVC6200 digital valve controller, which not only enhanced precision control but also offered insights into valve condition through diagnostics and monitoring.

Fisher V500 eccentric rotary plug valve with VTC trim set and tungsten carbide coating on the internal body surface enhances the durability and performance of the control valve, making it resistant to thermal shock and erosion.



Fisher™ V500 Eccentric Plug Valve and VTC trim set

SOLUTION (continued)

With the upgraded Fisher™ V500 eccentric plug valve installed on-site, the customer solved their plant safety concerns, extended the control valve lifecycle, improved operational reliability, and reduced downtime frequency by 15 days a year. The valve has been running smoothly for 15 months without causing any shutdowns. The customer also reported financial savings of \$100,000 USD on maintenance costs and \$2,000,000 USD on downtime expenses. Their feedback was positive, stating, “The newly supplied Fisher V500 eccentric plug valve with VTC internals for CLO service is working satisfactorily.” Additionally, they also expressed interest in partnering further with Emerson for control valve maintenance, turnaround optimization, digitalization, critical application solutions and spare parts supply.

This success story is an opportunity for Emerson Lifecycle Services to cultivate another strong customer relationship in the region by demonstrating proven control valve product and service experience.



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