

Fisher® Protected Inside Seat Extended Valve Seat Life in Power Plant Boiler Feedwater Regulator Application

RESULTS

- Fisher® protected inside seat design successfully addressed valve seat leakage issue due to plug-tip erosion caused by the presence of magnetites in the boiler feedwater.
- Fisher HPT valve with Cavitrol™ III trim and protected inside seat design extended valve seat life and eliminated water blowout—which could cost \$1,500 per day— by improving valve shutoff capabilities.
- Enhanced valve performance resulted in reduced maintenance and plant operation disruption.



APPLICATION

Boiler feedwater regulator valve

CUSTOMER

Power plant in Thailand

CHALLENGE

The boiler feedwater regulator valve plays a critical role in providing feedwater to the boiler during normal operation. Difficulty in maintaining the boiler water level results in loss of treated water due to water blowout.

An independent power producer encountered a water blowout issue in their plant. After some investigations, it was discovered that the passing issue in the boiler feedwater regulating valve was the cause of the problem. When the valve was dismantled for inspection, the plant personnel found that the tip of the valve plug was showing uneven teethlike erosion damage. Similar damage pattern was also observed on the valve seat ring seating surface. Due to time constraint, the valve was repaired and returned to service.

After three months of operation, the plug-tip erosion damage reoccurred. With increasing valve maintenance and plant operation disruptions, the customer approached the Emerson local business partner in Thailand, Kanit Engineering Corp. Ltd., for a solution to the problem.

The protected inside seat design for control valves with Cavitrol™ III trim addresses seat leakage due to plug-tip erosion.



SOLUTION

Engineers from Emerson and Kanit Engineering investigated the valve erosion problem. After analyzing the damaged trim and reviewing plant operation data, a Fisher valve solution that included the protected inside seat design was recommended.

The protected inside seat is designed to address plug-tip erosion, caused by entrained particles in the boiler feedwater system. These particulate, driven by the jets exiting the cage holes, can cause severe damage when the plug tip is located in front of the holes for an extended period of time.

With the Fisher protected inside seat design, a bevel on the inside of the plug tip is enclosed within a machined groove in the upper surface of the seat ring. The surfaces for shutoff are the inside of the plug tip and the radius in the groove of the seat ring. This protected seat feature does not allow the controlled shutoff surfaces to be exposed to potential erosion in the flowstream.

RESULT

The solution with Fisher protected inside seat design was installed in early 2010. After two years of operation, the power plant has been very satisfied with the performance and seat life extension of the valve in this demanding application. Unnecessary valve maintenance and plant operations disruptions due to valve trim erosion damage have been reduced. More importantly, the solution has helped eliminate water blowout which could cost the power plant \$1,500 per day. The four boiler feedwater regulator valves in the plant now have Fisher NPS 6 HPT valves with Cavitrol III trim installed, complete with the protected inside seat design.

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