POPPET VALVE PROJECT

POPPET VALVE PROJECT SOLVES RTO RELIABILITY ISSUES

OPERATING ISSUE

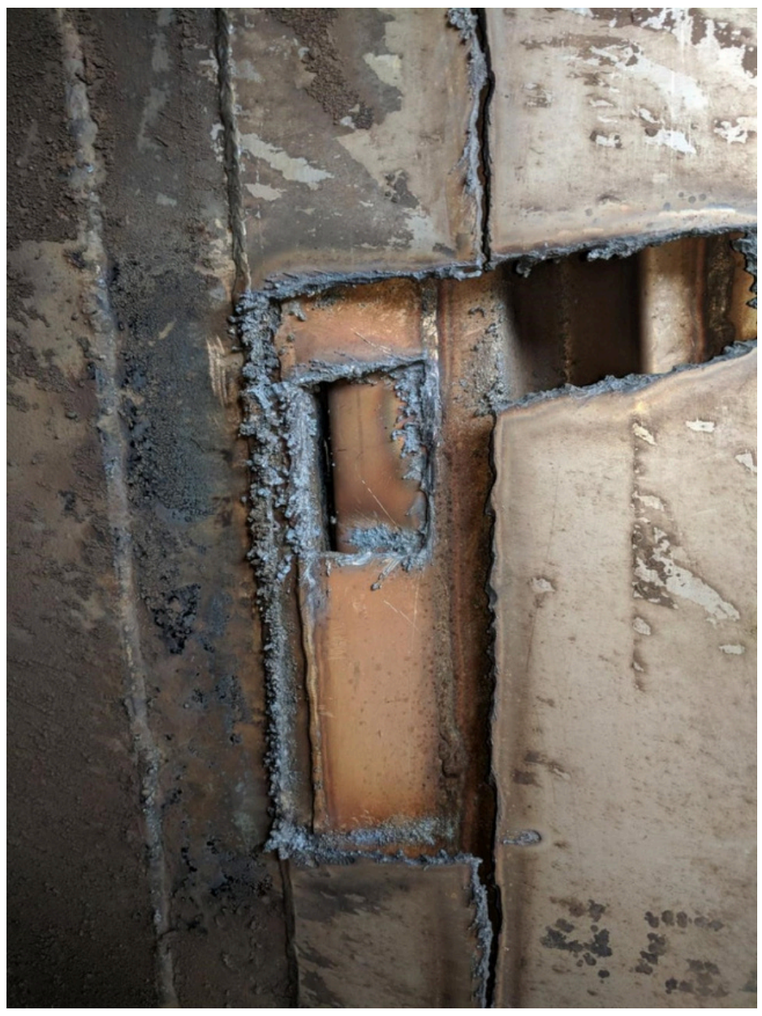
A quasi-municipal, industrial wastewater treatment facility in the Southwest asked PolSys Services for a solution to improve the on-stream reliability of two Regenerative Thermal Oxidizers (RTOs) at their facility. Although the plant is required to operate continuously, their systems were shutting down multiple times a week in some cases - causing major operating and environmental compliance issues for the plant.

PROJECT SOLUTION

A PolSys Senior Field Service Engineer visited the site to meet with the Facilities Manager, perform an inspection, and speak with plant personnel to gather as much information as possible about the shutdowns. After a comprehensive internal and external inspection and review of operating conditions, our engineers determined that poppet valve failures were the root cause of the frequent system shutdowns.

In addition to resolving current on-stream issues, the plan of action needed to address anticipated reliability issues. However, since the plant runs 24/7, this facility could not afford to devote precious downtime for extensive, lengthy system repairs.

To engineer the best long-term solution, PolSys first completed an in-depth review of the design of the RTOs, as well as the facility's operating conditions, process parameters, exhaust characteristics, destruction requirements, and fuel-efficiency needs. Our team quickly identified the issues and, working with the customer, outlined a plan that was suitable for all parties.



BEFORE: Expansion joint - 3 layers of liners

BEFORE: Connection at exhaust stack

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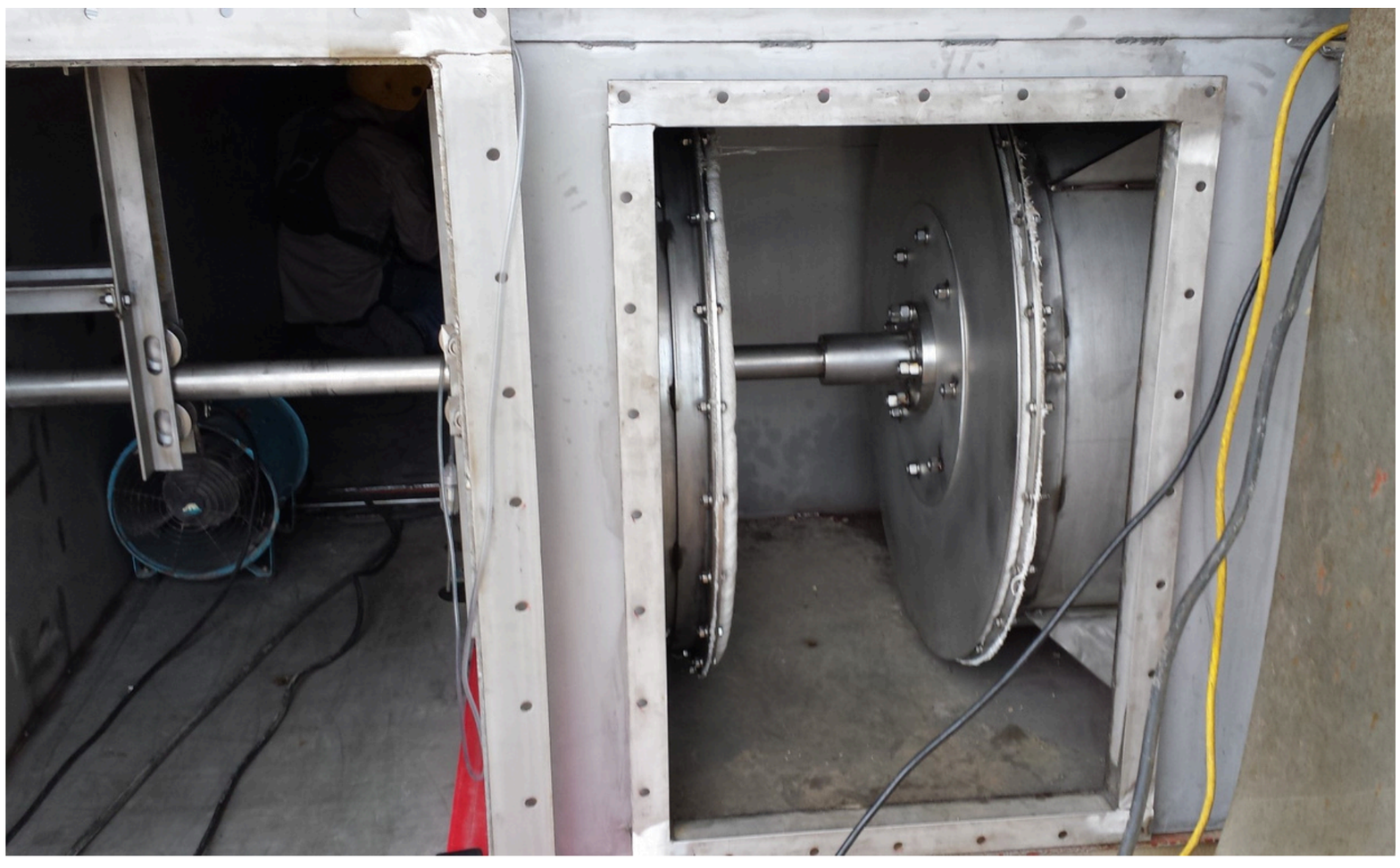
Three items were deemed insufficient for the service. A carbon steel shell with a Hastelloy liner was specified by the original manufacturer, but a carbon steel shell with a lower-quality 304 Stainless Steel liner and expansion joints were provided. Secondly, warped shafts on the horizontal stroke poppet valves caused inconsistent proximity detection which resulted in faulty valve positioning reported to the PLC. Lastly, the original manufacturer deployed single-directional pneumatic solenoid valves that rely on a single spring or tiny valve pin for operation. These pins are susceptible to sticking when exposed to moisture or debris, which caused the pin to stick in this facility's high-humidity environment.

To resolve these issues, PolSys Services engineered and executed a variety of upgrades. We installed new high-quality poppet valve assemblies, interconnecting ductwork, and expansion joints below the RTO media beds. We also replaced the single-directional solenoids with high-quality, powered solenoids that rely on power to open and close vs. a spring. Low-quality actuators prone to reliability issues were replaced with high-quality, pneumatic actuators more immune to debris and moisture. Finally, we installed new cylinders, proximity switches, and wiring, along with more suitable gasketing. All work was completed without incurring any unplanned downtime.



ABOUT POLSYS SERVICES

PolSys Services is the leading provider of onsite technical services for all types of air pollution control equipment, industrial control systems, and burners/gas trains. As this case study illustrates, we don't just fix presenting problems, we solve complicated underlying issues. Because we work on all makes and models of equipment, our team is completely impartial. We'll inform you of any defect or other issues we find, including design and installation flaws. Original system manufacturers are not incentivized to do this.

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