

Stop Profit Leakage

Deploying a Retrofit3D solution to prevent power loss

Location: South Korea

Client: Electric power company

Leaking Valves, Leaking Profits

Boiler feedwater pumps are critical to the smooth operation of power plants. However, their performance can be severely undermined when the boiler feedwater pump recirculation valve is not performing well. A coal-fired power plant in South Korea discovered this firsthand when their existing competitor trim valves began to fail.

Since the competitor valves were installed in 2016, they experienced severe passing (leakage) due to cavitation, heavy body and trim erosion, and disk stack separation. This resulted in inefficient and unstable plant operations: The plant was losing the equivalent of £470K in power per year to compensate for the boiler feedwater pump flow rate. Vibration and noise levels were also far higher than acceptable, negatively impacting plant operators on a daily basis.

The plant engineers initially contacted the original equipment manufacturer (OEM) regarding the issues, but were not satisfied with the remediation suggested. Repairs and maintenance costs were up to £290K per year – an unsustainable and unacceptable expense.



A Multiplicity of Problems

IMI Critical Engineering had already successfully aided several similar plants in South Korea that had experienced nearly identical problems. IMI Critical now came on site to evaluate the situation. IMI Critical's expert analysis revealed multiple issues with the competitor valves:

- Poor control of fluid velocity was causing cavitation and vibration
- Incorrect brazing engineering had resulted in disk separation
- The trim size was too small, producing very high fluid velocity at seat (97.3m/s)
- The flow direction for flashing service was incorrect, eroding the body of the valve
- The welded seat design required protracted maintenance times



“ We showed the customer why the valve was performing poorly and helped them understand how much money they were losing by providing a full cost and revenue loss analysis in addition to the technical presentation.

- Edward (IDu) Kim, Pre-engineering Manager

A Powerful Combination

IMI Critical proposed an innovative Retrofit3D solution that could be implemented at speed and which would ensure operational efficiencies and cost savings for years to come. The existing valves would be replaced with IMI Critical valves while retaining the existing hydraulic actuators to minimize the scope of the upgrade.

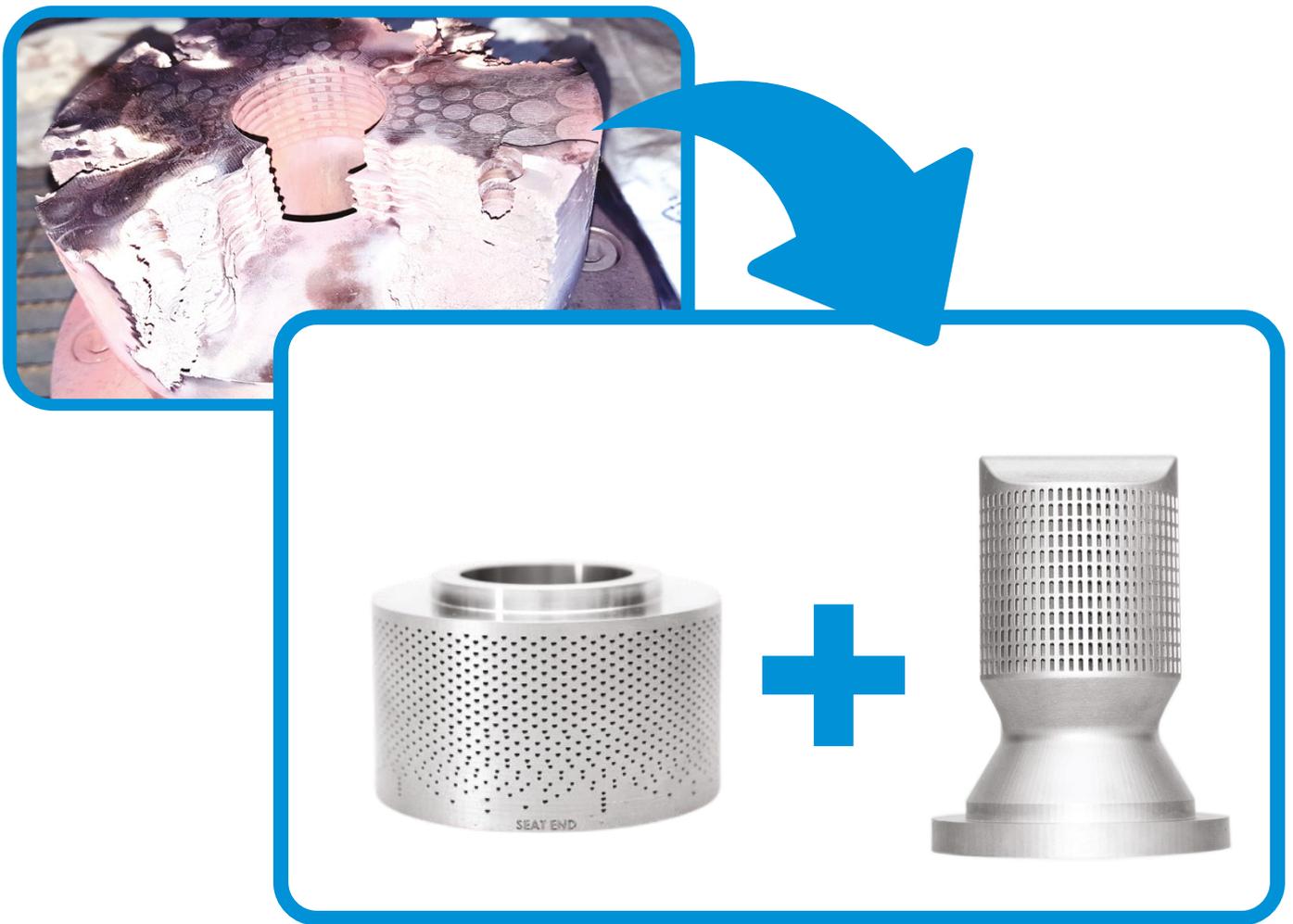
The IMI Critical valves were custom-designed based on actual operating cases at the plant. The recommended valves incorporate a combination of IMI Critical's multi-stage DRAG® disk stack and multi-stage DRAG® seat basket. This powerful combination effectively protects the trim and the valve body from flashing and cavitation. The DRAG® disk stacks limit the trim exit velocity to below 23m/s, while the DRAG® seat basket moves the point of flashing out of the seating area, thereby protecting the seating surfaces against a high velocity steam/water mixture. The quick-change trim of the valves guarantee ease-of-maintenance going forward.

“ We've been suffering with chronic problems due to repeated valve damage and heavy seat leakage. We couldn't resolve the issues despite having tried several upgrades with the original valve maker. However, after several meetings with IMI Critical, we became confident that IMI Critical has the capability to fix the chronic problem as they bring plenty of references and deep understanding on the root cause of the issues.

- Power Plant Operations Manager

Delivering Sustainable Success

With the new IMI Critical valves in place, the plant is no longer leaking profitability in the form of huge power losses and high repair costs. Nor are plant operators subject to unsafe levels of noise during plant operation or routine maintenance activities. Due to the robustness of the single-piece seat basket as well as the ability to point the seat basket exit flow straight into the downstream pipe, IMI Critical's Retrofit3D solution reduces damage to the trim and the body, leading to better valve performance and increased trim life.



“ IMI Critical is committed to understanding our customers' challenges and solving for them in a way that addresses root causes, meets current operational demands, and future-proofs the business to ensure profitability... in delivering innovative solutions, we support our customers' sustainable success.

- Edward (IDu) Kim, Pre-engineering Manager

Great Value from Great Valves

By taking advantage of IMI Critical's Retrofit3D solution and DRAG® Disk Stack technology, our customers are able to:



Save money

We have a complete valve as solution, thus we save money by keeping the actuator and by eliminating the continuous need of maintenance and stop the leakage.



Move quickly

Our full on-site evaluation, in-house expertise, and complete overarching engineering solution meant that we could move quickly and create a solution which worked perfectly, first time.



Improve total cost of ownership

Huge power losses and high repair costs have been irradiated, saving significant profits. Alleviated safety concerns by preventing high pressure, high temperature body erosion through flashing.



Increase efficiencies and reliability

The retrofitted valves deliver greater process control, higher performance levels, and stronger reliability for the energy plant.

Contact us at retrofit3d@imi-critical.com or visit www.retrofit3D.com by scanning the QR code for more information and to speak to our product experts.

