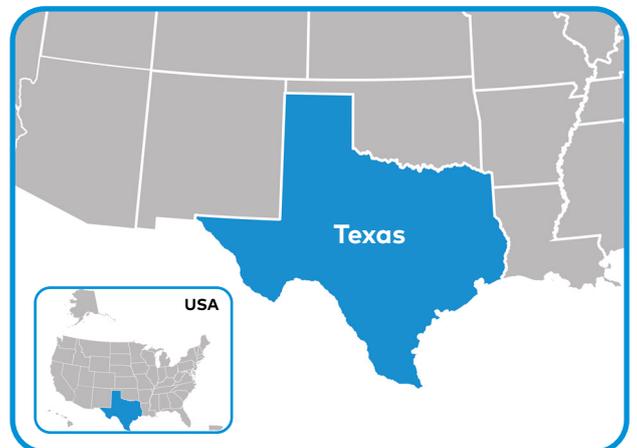


Refinery Saved from Severe Vibration Issues

The Challenge

A refinery in Texas that processes crude oil and natural gas liquids (NGL) into transportation fuels, petroleum coke, NGL, and solvents, was experiencing severe vibration of the steam let-down valve on its NGL unit. The vibration caused frequent breakage of the stem and plug coupling, poor flow control especially at lower strokes, and excess noise.

The customer tried to reduce the vibration by adding concrete to the valve and piping supports, but when this did not solve the problem, the customer turned to IMI Critical Engineering.



The Solution

An IMI Critical Engineering team analysed the valve operating conditions and the piping and system layout. This analysis found that the competitor's valve design wasn't suitable for the application due to inadequate stages in the cage as well as loose fits and tolerances of the hanging cage design.

The engineers discovered that gas/steam passing through the valve trim was exiting at too high a velocity. This was causing the valve to vibrate, which was in turn causing fatigue in the valve trim and surrounding piping. There were additional challenges as the current valve was screwed into the seat ring with a hanging cage. It was also located between two 90° bends in the piping, resulting in more turbulence in the flow through the valve.

Our engineers recommended a new DRAG® trim to reduce the velocity of fluids exiting the valve. The redesign retained the screwed-in seat ring but moved to a compressed design for the disk stack (8" trim, 8" stroke with a cv of 764) which fitted the flow conditions of the valve. The stack incorporated 2-4 let-down stages to provide velocity control and reduce vibration. The disk stack was manufactured using IMI Critical's Retrofit3D valve trim upgrade solution and fitted into the valve body.

Retrofit3D combines state-of-the-art additive manufacturing and traditional manufacturing methods to make precision-engineered solutions to complex operating conditions.

The trim kit (cage, stem, plug, seat and soft goods) was delivered and installed within eight weeks and, thanks to IMI Critical's Retrofit3D solution, the valve has been operating reliably and efficiently ever since.



Customer valve with a Retrofit3D trim installed



Valve disassembly at our facility



Original cage removed during valve disassembly

Great Value from Great Valves

By taking advantage of IMI Critical's Retrofit3D solution technology, our customer's are able to:



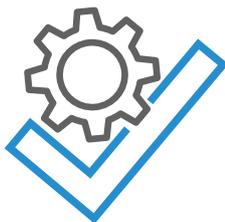
Save money

Retrofit3D is a cost-effective solution, avoiding expensive installation costs such as engineering, pipe cutting, welding, pressure testing, and QA testing.



Move quickly

As a drop-in solution, Retrofit3D takes away the time-consuming activities of replacing an entire valve. Furthermore, using additive manufacturing technology, Retrofit3D allows quick turnaround, so you don't have to plan months ahead.



Improve TCO

Lower maintenance, improved efficiency, and better trim performance, along with a reduced need to plan and stock spares, provides a better total cost of ownership.

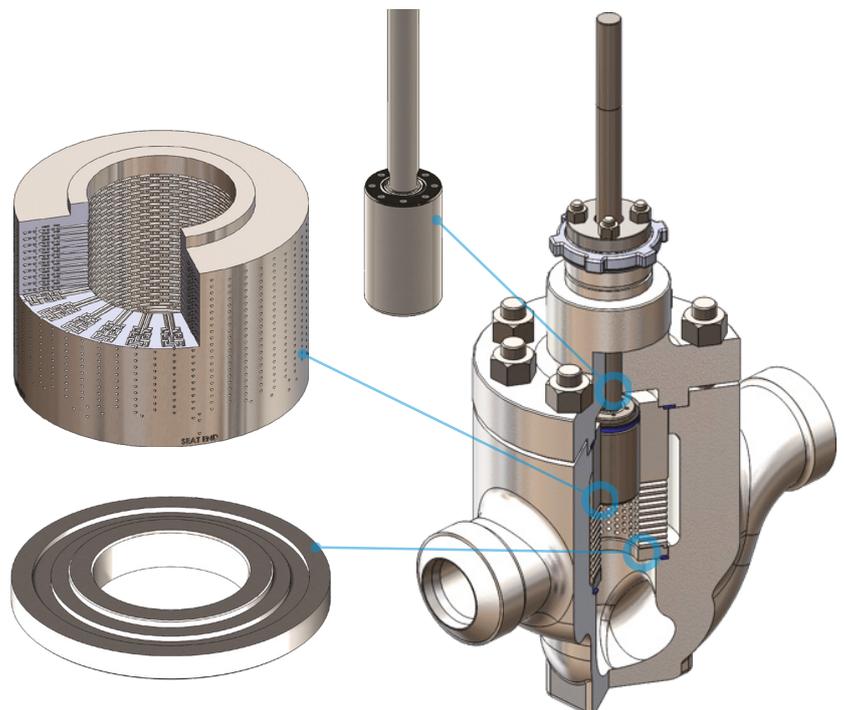


Increase efficiencies and reliability

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

Example Trim

IMI Critical's Retrofit3D solution and DRAG® Disk Stack technology allows plants to seamlessly upgrade their valves to cope with significant changes in process conditions.



“ IMI CCI valves require minimal maintenance and deliver exceptional performance.

“ It is expensive and time-consuming to replace a valve... being able to simply drop in a trim set – that is huge.

“ Retrofit3D helped us stay within our budget and keep the plant competitive in the marketplace.

Retrofit3D is available for over 50 different valve models, so contact us at retrofit3d@imi-critical.com now, and let us improve your control valve operations!