

Fisher® Control-Disk™ Valves Reduce Variability by 5% at INEOS® Chlor Plant

RESULTS

- Reduced variability by 5%, resulting in higher throughput
- Optimized temperature set point, eliminating plant safety trips
- Avoided at least six unplanned shutdowns, saving up to an estimated \$600,000 USD
- Enabled the condensers to perform at a 96% Overall Equipment Effectiveness (OEE) rating — a record high for the Runcorn plant



APPLICATION

Ethylene Dichloride plant and its primary condensers

CUSTOMER

INEOS Chlor in Runcorn, Cheshire, United Kingdom

CHALLENGE

The Runcorn plant had been using traditional butterfly valves to control the temperature and flow of cooling water to its primary condensers. The reliable, accurate control of these valves was critical to the process.

If the condensers' temperature is too low, there will be residual chlorine in the system, which has to be removed. If the temperature is too high, there is increased risk of a safety trip or plant shutdown. Each trip and subsequent unplanned shutdown can cost INEOS Chlor more than \$100,000 USD.

The Runcorn plant had used traditional butterfly valves to control the temperature and flow of cooling water to the primary condensers. Unfortunately, the traditional butterfly valves had a small control range and a large deadband, which reduced their ability to respond to temperature changes. In the previous 12 months, the plant had experienced 23 trips leading to a significant loss of production. INEOS Chlor needed a better, more reliable valve solution for this critical application, and they sought help from Emerson Process Management.

The Fisher® Control-Disk™ valve, with its true equal percentage trim technology, has changed INEOS Chlor's traditional approach to selecting butterfly valves.

“For a plant this size, even a modest reduction in variability can have a significant payback. The Control-Disk™ valve applications not only saved us money, but also enabled us to optimize process control without sacrificing flow capacity or needing to re-pipe.”

Barry Makepeace
Control & Instrumentation Engineer
INEOS Chlor - Runcorn, United Kingdom



SOLUTION

Emerson designed the Fisher® Control-Disk™ valve to offer better control in situations where a butterfly valve is preferred or where it would be too costly to change a butterfly valve for another valve style. The effective control range (15% and 70% of travel) of the Control-Disk valve approaches that of a segmented ball valve. This is achieved through a patented disc design that reduces the flow available at lower degrees of opening without compromising flow at the higher end of the travel range.

Working with Emerson valve experts in the Stockport, UK office, INEOS Chlor replaced four traditional butterfly valves with the new Fisher Control-Disk design. All four assemblies were installed on primary condensers and all four included FIELDVUE™ digital valve controllers to help monitor valve performance.

Installation of the Fisher Control-Disk valves resulted in a significant increase in process performance and reliability, as well as a reduction in dynamic error and dead band.

RESULTS

Tighter, more reliable control, achieved by installing the Control-Disk valves, enabled plant operators to refine their control strategy, optimize temperature set points, and avoid at least six unplanned shutdowns -- saving the plant up to \$600,000 USD.



The Control-Disk™ rotary valve offers excellent throttling performance and an equal percentage flow characteristic, which provides a throttling range comparable to that of a segmented ball valve. This improved capability enables control closer to the target set point, regardless of process disturbances, and reduces process variability.

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Emerson Process Management
Marshalltown, Iowa 50158 USA
Sorocaba, 18087 Brazil
Chatham, Kent ME4 4QZ UK
Dubai, United Arab Emirates
Singapore 128461 Singapore
www.EmersonProcess.com/Fisher

