

## Refinery Increased Throughput by 5,000 Barrels Per Day Using the Fisher® DST-G Control Valve

### RESULTS

- Optimized gas oil conversion rate
- Increased throughput in hydrocracker unit by 5,000 barrels per day
- Increased production by up to \$15,000 per day
- Quickly returned investment—control valve paid for itself in one month



### APPLICATION

Hot, low-pressure, flash drum level control in the hydrocracker unit

### CUSTOMER

Refinery in the U.S. Gulf Coast region

### CHALLENGE

After a major expansion at this refinery, operations began a debottlenecking project to further increase total production. The analysis determined that their hot, low-pressure, flash drum level control valve was not capable of the new target flow rate. Although the valve was working satisfactorily after the expansion, the new flow rates projected by the debottlenecking project would force the valve wide open, resulting in poor controllability and a reduction in conversion of gas oil to diesel.

The projected larger flow rate required a valve with more capacity, as well as the capability to eliminate cavitation and the potential outgassing damage when hot gas oil goes through a significant pressure drop. In this case, the level control valve in the refinery's hydrocracker unit experiences pressure drops of 200 psi and more. At these pressure drops, the gas oil will flash, cavitate, and outgas. The gas oil is also sour and carries particulate that must pass through the control valve without plugging or damaging the trim.

*Fisher® DST-G control valve is used in outgassing applications that may also contain entrained particulate. DST-G is mainly used in refining and oil & gas applications.*



### SOLUTION

Refinery personnel worked with Emerson's local business partner, John H. Carter Company, from the beginning of the debottlenecking project. The John H. Carter engineers reviewed the engineering of the critical and severe service valves to determine what changes were required. In several applications, including the level control valve, the engineers employed a special sizing technique to account for the outgassing potential. That special analysis validated the capability of most of the current valves; however, the hot, low-pressure level control valve was selected for upgrade. A new, larger Fisher® DST-G valve was required. The DST-G valve is capable of handling the damaging outgassing service by staging the pressure drop. The valve trim is designed to allow particulate up to 6 mm (¼-inch) to pass through without plugging or damage.

In order to take advantage of their debottlenecking project and realize the full capabilities of their hydrocracker, the refinery needed this valve to be delivered quickly. They utilized the Emerson Instrument & Valve Services center near their refinery to construct the new valve. After installation, the controllability and increased capacity from the new valve allowed the hydrocracker to process an additional 5,000 barrels per day of gas oil. A conservative estimate based on the value of diesel fuel showed the new Fisher valve contributing an additional \$15,000 USD per day in production. That adds up to over \$5 million USD per year.

This valve has been in service for one year with no issues.

### RESOURCES

#### Brochure on Fisher Cavitation-Control Technologies



 <http://www.Facebook.com/FisherValves>

 <http://www.YouTube.com/user/FisherControlValve>

 <http://www.Twitter.com/FisherValves>

 <http://www.Linkedin.com/groups/Fisher-3941826>

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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](http://www.EmersonProcess.com/Fisher)

