

# Operation of Hydraulic Power Recovery Turbine Improved with Fisher® easy-e™ Valve

## RESULTS

- Successful recovery of energy from the rich Benfield™ solution reduced steam consumption by 20 metric tons per day and resulted in significant cost saving.
- The Fisher EU valve helped the plant achieve tighter control of the hydraulic power recovery turbine for more efficient operation.
- Fisher Whisper Trim™ III reduced the vibration problem associated with turbulent fluid out-gassing.



## APPLICATION

Hydraulic power recovery turbine inlet valve

## CUSTOMER

Gas processing plant in Malaysia

## CHALLENGE

The removal of acid gasses (such as carbon dioxide and hydrogen sulfide) from the feed gas in a gas processing plant is usually achieved by pumping the gas through an absorber unit and contacting it with a lean solvent such as a Benfield solution. A Benfield solution uses an activated, inhibited hot potassium carbonate solution to remove the acid gas components. Instead of dissipating energy absorbed by the rich Benfield solution as it exits the absorber, a hydraulic power recovery turbine (HPRT) is used to recover the energy. The HPRT reduces the steam consumption needed for the steam turbine to drive the lean Benfield solution pump.

This gas processing plant had been unable to commission their HPRT after its installation due to a performance problem with the throttling valve at the inlet to the HPRT. The plant's reliability team was tasked with finding a solution and approached their Emerson local business partner in Malaysia to help solve the problem.

*Fisher® easy-e™ EU valves with Whisper Trim™ III are ideal for throttling or on-off control of a variety of liquids and gasses.*

### SOLUTION

Engineers from Emerson Process Management Asia Pacific and Malaysia proposed replacing the existing butterfly valve with an NPS 14 Fisher easy-e EU sliding stem control valve. The valve was selected to provide a deadband of one percent or less for tighter control of the HPRT.

Because of the high pressure differential and entrained gases in the Benfield solution, outgassing in the valve was a concern. This turbulent two-phase flow can result in high vibration at the valve trim causing wear on the trim and valve stem breakage. To address this problem, Fisher Whisper Trim III with special drilled passages was specified to control the rapid fluid expansion. The valve body was designed to minimize the amount of piping modifications needed to install the globe valve between the flanges previously occupied by the shorter butterfly valve.

### RESULT

To meet the plant's urgent request for a solution, special efforts were made by Emerson's Fisher valve division's engineering and manufacturing teams. The teams worked together to get the valve designed, built, and delivered within the plant's project schedule.

The Fisher valve has allowed the plant to successfully commission the HPRT. In addition to improving the overall efficiency of the acid gas removal process, the plant has managed to reduce steam consumption by 20 metric tons per day resulting in a significant cost savings.

For more information on severe service solutions, visit [www.fishersevereservice.com](http://www.fishersevereservice.com).

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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)

