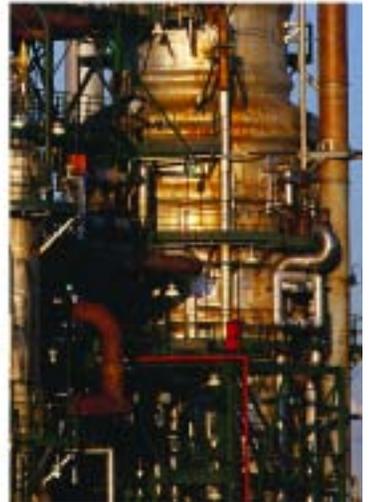
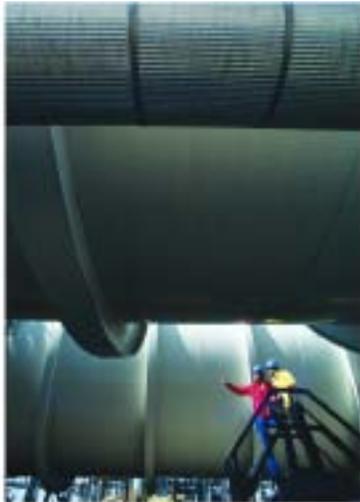
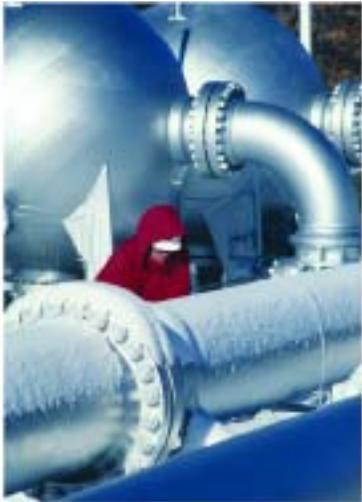


Fisher® Rich Amine Letdown Solutions



Application Discussion

Amines and other chemicals are used selectively to remove acid gases (H_2S , CO_2) from raw natural gas streams. This makes the gas composition acceptable for sale or for use in other parts of a given process. The gas stream is fed into the bottom of an absorption tower while the absorption liquid is fed into the top of the tower to create a counter flow contact system. The level valve, also known as the rich amine letdown valve, controls the liquid level in the tower. Clean gas flows from the top of the absorber.

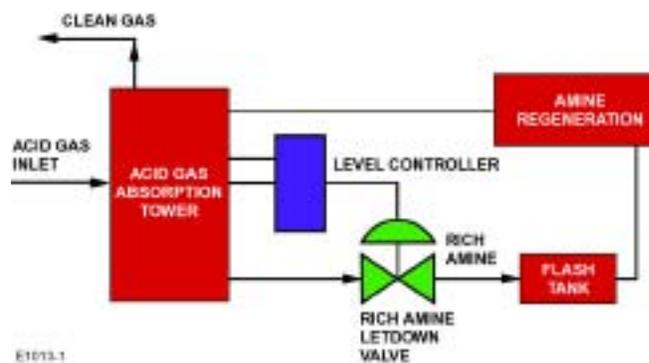
At the bottom of the absorption tower, the rich amine leaves through the level control valve. The rich amine then goes to a flash tank where large portions of the absorbed gases are off-gassed. From there, the rich amine goes through various processes to be regenerated. The control challenge with this application is created by the entrained gas in the rich-amine solution. As the fluid passes through the letdown valve it takes a pressure drop due to the pressure differential between the tower and the flash tank. As this pressure drop takes place, some of the entrained gas comes out of solution; this is called outgassing.

As a result of this outgassing, two-phase flow will develop in the valve. One phase is the liquid amine, the other involves the CO_2 or H_2S that come out of solution. This two-phase flow can produce excessive vibration and erosion problems. Outgassing requires special consideration in the selection of valve type, trim style and materials. Generally speaking, the overall approach is dependent on the severity of the pressure drop and the amount of gas released. Other effects that need to be considered are:

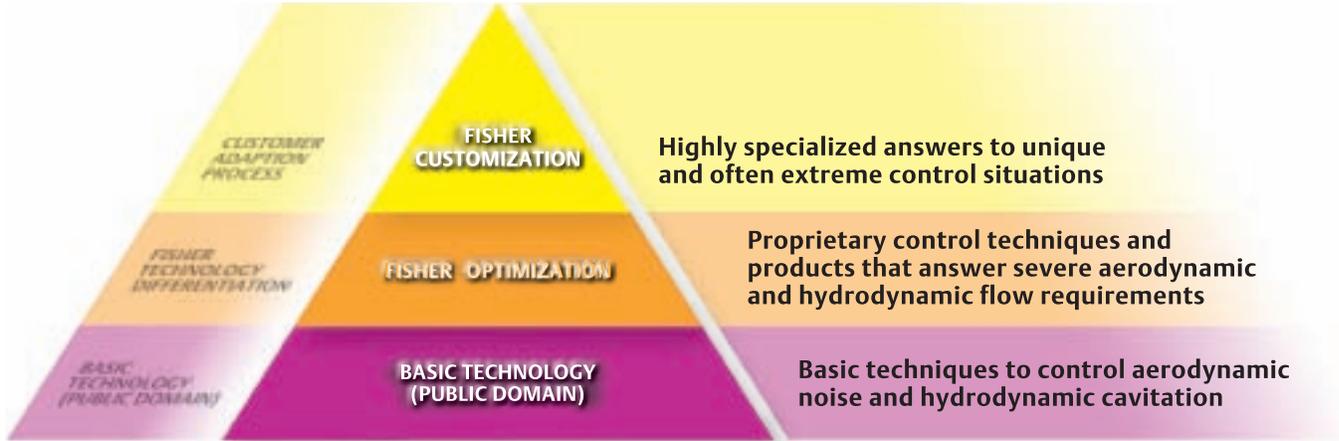
- Vibration due to outgassing of entrained gases in the process streams
- Erosion due to outgassing, cavitation and flashing
- Valve internal corrosion due to entrained corrosive gases

Emerson has developed specific Fisher valve and trim selections based on the pressure drop and outgassing for each installation. These solutions offer protection against cavitation, erosion, plugging and leakage. Cavitation formation and outgassing effects are eliminated by unique pressure control of flow through the valve. The valves can be exposed to high pressure when closed so tight shutoff (ANSI Class V or greater) is critical as any leakage results in extensive damage to the valve.

Also, to ensure proper operation after installation, a Fisher FIELDVUE® Digital Valve Controller can be used to monitor valve performance. The FIELDVUE DVC provides diagnostic reviews can be conducted without interrupting the process in order to identify potential performance issues. This helps to ensure proper operation and tight shutoff over the normal service life of the valve.



Severe Service Control Hierarchy



Rich Amine Letdown – Control Valve Solutions

FISHER CUSTOMIZATION

The liquid amine solution within a large gas plant in Kazakstan contained a substantial volume of entrained gas. Special-design, high-capacity Fisher valves were utilized to address the need for expansion of the gases as well as the erosive effects associated with outgassing. See [D351296X012 at www.Fishersevereservice.com](http://www.Fishersevereservice.com) for additional details.

FISHER OPTIMIZATION

DST Trim



- Patented, multi-stage, anti-cavitation control trim
- Combines axial and radial flow patterns that can pass particulate without plugging
- Features protected seat design that helps avoid clearance flow erosion for long-term shutoff integrity

NotchFlo® Trim



- Utilizes multi-stage, axial flow process to control pressure drop, prevent cavitation and pass entrained particles
- Features protected seat design that helps avoid clearance flow erosion for long-term shutoff integrity

Whisper Trim®



- Utilizes multiple orifices of special shape, size and spacing to achieve noise reductions to 30 dBA
- Process flow-up technique keeps energy sources away from critical trim parts
- Trim parts furnished in hardened materials to extend service life

BASIC TECHNOLOGY



- Standard trim control valve
- Hardened trim materials to extend service life
- Flow direction to accommodate rapid gas expansion
- Downstream pipe designed to accommodate rapid fluid expansion

Emerson. Your partner in instrument and valve reliability.

The way you manage your key production assets directly affects your plant's performance and profitability. Emerson's Asset Optimization capabilities deliver world-class services and innovative technologies to increase the availability and performance of mechanical equipment, electrical systems, process equipment, instruments and valves for improved bottom-line results. Asset Optimization helps you improve process availability and attain peak performance, which means wherever you are in your plant's life cycle—startup, maximizing operations or life extension—by relying on Emerson's Asset Optimization capabilities, you'll be on the path to realizing the true potential of your plant's instruments and valves.

The Next Step

Contact your local Emerson Process Management sales office or sales representative location for more information or to make a purchase.

For severe service solutions, see us at www.FisherSevereService.com



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