Removal of Carried-Over Glycol Protects Downstream Molecular Sieve Bed

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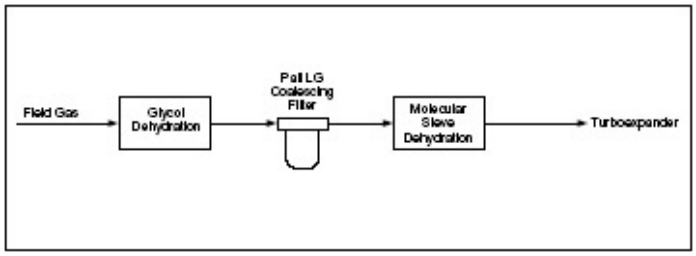
A major Texas producer operates a 80 MMSCFD turboexpander-cryogenic gasoline plant. The gas is dried in two stages: glycol dehydration followed by a molecular sieve before it enters the turboexpander. The schematic below describes the gas plant flow.

Figure 1. Gas Plant Schematic



Problem Areas

The design factors affecting dehydration include glycol concentration, circulation rate, contact time, pressure, and temperature. A well designed plant can still lose significant amounts of glycol from the contactor tower. This plant experienced glycol carry-over such that the glycol was fouling the downstream molecular sieve. As a result, the bed had to be changed twice per year at a replacement cost of $50,000/replacement. This cost a 2-day plant shutdown.

Solution

The operator installed the Pall LG Liquid/Gas Coalescing filtration system downstream of the glycol dehydration system to protect the molecular sieve bed. The LG Coalescer removes glycol and other liquids and solids from the gas stream. The LG filter assembly is a 24 inch diameter vessel containing nineteen (19) LG filters (part number CC3LG7) for a design flow rate of 80 MMSCFD at 800 psig. The LG Liquid/Gas Coalescer removes liquid aerosols to less than 0.003 ppm and 99.98% of all solid particles 0.3 microns and larger.

Results

The LG installation provided the operator with high quality gas for continuing drying in the molecular sieve bed. With the LG Coalescing Filter on-line, the molecular sieve unit is protected from carried-over glycol and other liquids and solids. The direct maintenance savings, as shown in Table 1, is approximately $740,000 per year. The LG Liquid/Gas Coalescing Filter Assembly is currently on-line for six months and has not reached the recommended changeout differential pressure.

Table 1. Direct Economic Benefits

Problem	Cost Savings Per One System Shutdown Avoided	Shutdowns Per Year[1]	Total Savings Per Year	Overall Savings[2]
Capital cost for replacement of molecular sieve bed	$50,000	2	$100,000	$200,000
Lost revenue for a 2 day plant shutdown of 80 MMSCFD of gas not processed	$320,000	2	$640,000	$1,280,000
Total Savings	$370,000	2	$740,000	$1,480,000

[1] - *Two shutdowns per year were experienced according to the operator. These shutdowns were in addition to the normal plant shutdowns.*
[2] - *These problems occurred for two years. Hence, the overall savings is equal to the total savings per year multiplied by two years.*