Compressor Station Support

Case Study 1

Methanol Determined in High Pressure Natural Gas

A midstream company needed to determine the concentration of methanol in gas collected from the high and low pressure sides of natural gas compressors as part of a hydrate inhibitor evaluation. A custom apparatus was constructed to prevent condensation of methanol when the pressure of natural gas was reduced from 800 psi to ambient pressure. Determination of the methanol was completed by gas chromatography.

Figure: Natural gas compressor station

Image source: Million-cameron-interstate-pipeline-station-dedicated

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Case Study 2

Condition-Based TEG Replacement Yields Considerable Savings

Triethylene glycol (TEG) in gas dehydrators is slowly oxidized by repeated exposure to water and high temperature. Performance degrades and corrosion increases as the TEG oxidizes, so spent TEG is replaced with fresh TEG, often on a time schedule. However, the rate of oxidation varies from dehydrator-to-dehydrator, causing the TEG in some dehydrators to be replaced too often when a conservative change interval is used. Conversely, if the TEG is not changed before it degrades, organic acids formed by oxidation and accumulated chlorides from produced water begin to attack the dehydrator metallurgy. One solution is to change the TEG based on condition rather than on a time schedule.

Figure: Gas Glycol Dehydration System

Image source: naturalgasindustryhub.com/Glycol-Dehydrator.jpg

TEG samples from a series of gas dehydrators was analyzed on a periodic basis. The condition of the TEG was assessed by monitoring a number of parameters including pH, TDS, and the concentrations of chloride and sulfate. Metal concentrations were measured to determine when the TEG degradation had progressed to a point that corrosion was beginning to attack the metallurgy. Changing the TEG based on its condition increased TEG service life and decreased dehydrator corrosion, resulting in considerable savings compared to time-based TEG replacement.

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Case Study 3

Sulfur Reducing Bacteria Identified as Cause of Hydrogen Sulfide Odor

A hydrogen sulfide odor was detected when brine was being loaded from the storage tanks at two compressor stations. Brine samples collected from the slug catcher and brine storage tanks confirmed the presence of sulfur reducing bacteria. Black solids collected from the slug catcher and the brine storage tank were identified as iron sulfide. Treatment with a biocide killed the bacteria and eliminated the odor.

Figure: Sulfur reducing bacteria

Image source: Million-cameron-interstate-pipeline-station-dedicated