Effect of Maldistribution on Deep Dehydration Using TEG

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ABSTRACT

Treated gas can be dehydrated to < 1 lb/MMSCF with glycol stripped very deeply using a Stahl column and relatively large dry stripping gas rates. Stahl columns are commonly towers containing beds of random packing. Inattention to proper liquid and gas distribution can result in serious non-uniformity of flows at various tower elevations, and these non-uniformities tend to persist through the tower rather than dissipate as the phases flow up and down. The result can be poor stripping efficiency. Ensuring the uniformity of liquid and gas distribution becomes increasingly important as the specifications for water content grow more stringent.

At the 2017 LRGCC, several deep water-removal glycol dehydration systems were evaluated by AECOM. The simulation tools used at that time did not explain the poor performance of Stahl stripping columns in actual operations. Discussion following the presentation suggested maldistribution as a possible cause. In this follow up contribution, hydraulic modeling and a fully mass and heat transfer rate based simulator are used to examine just what the potential impact of liquid and gas maldistribution can be on the final water content following dehydration. Modeling is benchmarked against dehydration unit performance data.