Replace Glycol Dehydrator With Separators and In-line Heaters

PRO Fact Sheet No. 204

Partner Reported Opportunities (PROs) for Reducing Methane Emissions

Applicable sector(s):

☐ Production ☐ Processing ■ Transmission and Distribution

Partners reporting this PRO: Enron Gas Pipeline Group

Other related PROs: Reduce Glycol Circulation Rates in Dehydrators, Replace Gas Assisted Glycol Pumps with Electric Pumps, Replace Glycol Dehydration Units with Methanol Injection

Compressors/Engines	☐
Dehydrators	■
Pipelines	☐
Pneumatics/Controls	☐
Tanks	☐
Valves	☐
Wells	☐
Other	☐

Technology/Practice Overview

Description

Removing water from the pipeline gas entering the distribution system may be necessary to prevent hydrate formation in the distribution pipes, especially in cold operational environments. The typical method for water removal in the natural gas industry is glycol dehydration. As an alternative to conventional glycol dehydration, partners have reported installing separators and in-line heaters.

Pipeline gas is expanded and auto-refrigerated in a cyclone separator to enhance water condensation and separation. The gas is then reheated to restore the gas to a dew point well below any conditions in the distribution system. Since no glycol is used to remove water from gas, the methane emissions from a glycol dehydrator are avoided.

Methane Savings: 130 Mcf per year

Costs

Capital Costs (including installation)

☐ <$1,000 ☐ $1,000 – $10,000 ■ >$10,000

Operating and Maintenance Costs (annual)

■ <$100 ☐ $100-$1,000 ☐ >$1,000

Payback (Years)

☐ 0–1 ■ 1–3 ☐ 3–10 ☐ >10

Benefits

Reducing methane emissions was an associated benefit of the project.

Operating Requirements

Electrical resistance in-line heaters require an electrical power supply. Upstream pressure must be sufficient for expansion chilling and still meet distribution requirements.

Applicability

This technology applies to transmission and distribution systems that operate in cold climates.

Methane Emissions Reductions

The methane savings are the avoided emissions from conventional glycol dehydration operations. Based on industry rules-of-thumb, 3 scf of gas are required for each gallon of glycol circulated in a conventional dehydrator unit, and 3 gallons of glycol are needed per pound of water removed. Therefore, with no other controls, 9 scf of methane are emitted per pound of water removed. One partner reported methane savings of 1,930 Mcf from replacing 14 dehydrators.

Economic Analysis

Basis for Costs and Savings

Methane emissions reductions of 130 Mcf per year apply to dehydrating 10 MMcf per day of gas from 7 pounds to 4 pounds of water per MMcf of gas.

Discussion

This technology has a good payback. The capital and operational costs shown above are for installing and operating separators and in-line heaters. These costs are considerably lower than those associated with glycol dehydrators, and result in a quick payout. Methane savings are an additional benefit.