Install Pressurized Storage of Condensate

Technology/Practice Overview

Description

Natural gas production is often accompanied by significant amounts of water and condensate. The condensate is saturated with methane at pipeline pressures that range up to 750 psig. When transferred to atmospheric storage tanks, a pressure drop occurs causing the methane to flash out. Operators often vent this gas to the atmosphere. Interstage knockout in multi-stage compressors with interstage cooling also contains raw natural gas liquids (NGL) saturated in methane. If transferred to atmospheric storage, nearly all the methane will flash and vent to the atmosphere.

One partner reported installing pressurized storage, requiring pressurized transport of condensate to a gas plant for economic recovery of gas liquids and associated methane, volatile organic compounds (VOCs), and hazardous air pollutants (HAPs) emissions reductions.

Operating Requirements

Pressurized storage requires the use of pressurized transport vehicles. In addition, a blanket gas system would be required to maintain tank pressure. Pressure relief valves should also be calibrated for the specific operating conditions of the tank.

Applicability

This technology is applicable on all gas well and gathering/booster compressors.

Methane Emissions

Partners estimate condensate production of 10 barrels per MMcf of gas production

- ☐ Compressors/Engines
- ☐ Dehydrators
- ☐ Directed Inspection & Maintenance
- ☐ Pipelines
- ☐ Pneumatics/Controls
- ■ Tanks
- ☐ Valves
- ☐ Wells
- ☐ Other

Applicable Sector(s)

- ■ Production
- ■ Processing
- ■ Transmission
- ☐ Distribution

Economic and Environmental Benefits

Methane Savings

Estimated annual methane emission reductions	*7,000 Mcf per year per tank*

Economic Evaluation

Estimated Gas Price	Annual Methane Savings	Value of Annual Gas Savings*	Estimated Implementation Cost	Incremental Operating Cost	Payback (months)
$7.00/Mcf	7,000 Mcf	$52,000	$37,500	$2,500	10 Months
$5.00/Mcf	7,000 Mcf	$37,000	$37,500	$2,500	13 Months
$3.00/Mcf	7,000 Mcf	$22,000	$37,500	$2,500	22 Months

** Whole gas savings are calculated using a conversion factor of 94% methane in pipeline quality natural gas.*

Additional Benefits

- Reducing VOC and HAP emissions
- Preventing flashing losses

Other Related Documents:

Installing Vapor Recovery Units on Storage Tanks, Lessons Learned

Recover Gas During Condensate Loading, PRO No. 502

Install Pressurized Storage of Condensate (Cont'd)

and methane emissions of 250 scf per barrel of condensate. The condensate production estimate was made using a Hysim computer simulation program. Actual gas composition and condensate production will be unique to each production reservoir. Total partner reported methane emissions savings were 27,992 Mcf per year for 4 installations of pressurized storage tanks.

Economic Analysis

Basis for Costs and Emissions Savings

A methane emissions saving of 7,000 Mcf per year for each pressure storage installation was reported by the partner. Savings is based on a 400 barrel pressurized tank that stores gas liquids containing 250 scf of methane per barrel of condensate.

The capital cost, including installation, was reported to be $37,500 in 1998. The operating costs are estimated at $2,500 for an operator to assist in loading tank trucks for 100 hours annually, since this type of system would be more complex than loading from an atmospheric storage tank.

Discussion

By installing pressurized storage of condensate, operators prevent losses of a valuable product as a result of flashing. The primary benefit of installing the pressurized storage tanks is to reduce VOC and HAP emissions. The savings from recovering methane will justify the costs over a two-year period.

Methane Content of Natural Gas

The average methane content of natural gas varies by natural gas industry sector. The Natural Gas STAR Program assumes the following methane content of natural gas when estimating methane savings for Partner Reported Opportunities.

Production	79 %
Processing	87 %
Transmission and Distribution	94 %

EPA provides the suggested methane emissions estimating methods contained in this document as a tool to develop basic methane emissions estimates only. As regulatory reporting demands a higher-level of accuracy, the methane emission estimating methods and terminology contained in this document may not conform to the Greenhouse Gas Reporting Rule, 40 CFR Part 98, Subpart W methods or those in other EPA regulations.