



Recover Gas During Condensate Loading



Technology/Practice Overview

Description

Lease condensate production, when transferred from storage into tank trucks, can generate significant volumes of methane vapor due to pressure and temperature changes and evaporation. This methane is typically vented to the atmosphere to prevent the internal tank pressure from rising.

One Partner reported capturing methane that would otherwise be vented by connecting the tank truck vent to the condensate storage tank, or to a vapor recovery line. This has provided the Partner with the flexibility to send the methane to a sales line, use the methane for lease fuel, or flare the methane vapors.

Operating Requirements

To avoid methane emissions, the low-pressure gas in the natural gas liquids storage tank must be either flared or recovered with a vapor recovery unit.

Applicability

This technology applies to all condensate production operations using tank trucks or railroad tanks.

Methane Emissions

Methane emissions occur when methane and volatile organic compounds (VOC) flash or evaporate into the air displaced during the loading process. Considering that a loading cycle may occur every 3 to 5 days, approximately 100 loading transfers can occur per year. Using the *Pipeline Rules of Thumb* handbook,

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

Applicable Sector(s)

- Production
- Processing
- Transmission
- Distribution

Other Related Documents:

Pipe Glycol Dehydrator to Vapor Recovery Unit, PRO No. 203

Connect Casing to Vapor Recovery Unit, PRO No. 701

Economic and Environmental Benefits

Methane Savings

Estimated annual methane emission reductions *100 Mcf per storage unit*

Economic Evaluation

Estimated Gas Price	Annual Methane Savings	Value of Annual Gas Savings*	Estimated Implementation Cost	Incremental Operating Cost	Payback (months)
\$7.00/Mcf	100 Mcf	\$745	\$1,000	\$200	20 Months
\$5.00/Mcf	100 Mcf	\$530	\$1,000	\$200	28 Months
\$3.00/Mcf	100 Mcf	\$320	\$1,000	\$200	45 Months

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

Additional Benefits

- Safer loading operations
- Reduced VOC emissions

Recover Gas During Condensate Loading (Cont'd)

Fourth Edition, p. 492, the rate of methane emissions from evaporation can be estimated as 50 percent of the total volume filled. Partners have reported reducing methane emissions by 6,500 Mcf to 39,000 Mcf per year, which includes flashing losses.

Economic Analysis

Basis for Costs and Emissions Savings

Methane emissions reductions of 100 Mcf per year apply to the use of a single vapor recovery line used to recover vapor during truck loading every 3 to 5 days. Flashed gas savings can be estimated from site-specific data using GRI-GLYCalc.

The estimated costs of purchasing additional connections to route the tank truck vent to a useful outlet is approximately \$1,000. The additional operating costs to connect the lines are estimated at \$200.

Discussion

To implement this project, operators will need a vapor recovery line and the appropriate connections to attach the line to the tank, a VRU, or flare stack. If the methane is recovered to a sales or fuel line, the Partner can largely offset the cost of this project. In addition, operators will have a safer working environment since tank vents will not be a concern and the system will be closed loop. This project can payback in two years depending on frequency of loading, load volumes, temperature and pressure changes, the value of gas, among others.

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.