Portable Desiccant Dehydrators

Technology/Practice Overview

Description

Maintenance of glycol dehydrators at a natural gas well site often requires a complete shutdown of the unit during the service period. During this maintenance, production wells can either be shut in or vented to the atmosphere. Low pressure wells are often vented because it can be difficult to resume flow once they are shut in.

Portable desiccant dehydrators can be used in place of the glycol dehydrator during maintenance so that production is not interrupted and methane is not vented.

Operating Requirements

A portable desiccant dehydrator requires a truck that has been modified to house the dehydrator itself as well as carry other ancillary equipment and piping.

Applicability

Portable desiccant dehydrators can be used in situations where a large amount of gas would otherwise be vented during glycol dehydrator maintenance.

Methane Emissions

The methane emission savings are based on routing gas from an average gas stripper well to a portable desiccant dehydrator rather than venting the gas while maintenance is conducted on the glycol dehydrator.

Economic Analysis

Basis for Costs and Emissions Savings

Set-up and removal of the portable desiccant dehydrator is assumed to take three days each, meaning it is only in operation for a two day glycol dehydrator maintenance period. Methane savings

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

Applicable Sector(s)

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

Other Related Documents:

Replace Glycol Dehydration Units with Methanol Injection, PRO No. 205

Economic and Environmental Benefits

Methane Savings

Estimated annual methane emission reductions	*1,891 Mcf/yr per app.*

Economic Evaluation

Estimated Gas Price	Annual Methane Savings	Value of Annual Gas Savings*	Estimated Implementation Cost	Incremental Operating Cost	Payback (months)
$7.00/Mcf	1,891 Mcf	$14,000	$4,000	$5,000	8 Months
$5.00/Mcf	1,891 Mcf	$10,000	$4,000	$5,000	11 Months
$3.00/Mcf	1,891 Mcf	$6,000	$4,000	$5,000	18 Months

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

Additional Benefits

- Added revenue from recovering rather than venting gas during glycol dehydrator maintenance
- Preventing the interruption of production

Portable Desiccant Dehydrators (Cont'd)

are based on 40 applications on gas wells that vent 30 Mcf/d (thousand cubic feet per day). The methane content of the gas is assumed to be 78.8%. Therefore, at 30 Mcf/d for 2 days, 40 times per year, savings of 2,400 Mcf of natural gas can be achieved. This gas would contain 78.8% methane, resulting in methane emissions savings of 1,891 Mcf per year.

The capital cost of a 10 inch portable desiccant dehydrator is estimated at approximately $4,000, or greater than $400 per year amortized over a 10 year period. Operation costs of the desiccant dehydrator, including labor, transportation, set-up, and decommissioning, can be as high as $5,000 per year.

Discussion

Portable desiccant dehydrator are economical when used on gas wells larger than the average (15.6 Mcf/d) gas stripper well. A portable desiccant dehydrator is most economic when it can be operated year round on a number of different sites that may require maintenance. Portable desiccant dehydrator services may be contracted out so that the dehydrator is utilized year round if a production company does not have enough locations for continuous use.

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.