



Install Excess Flow Valves



Technology/Practice Overview

Description

Gas line breaks from ground movement, natural disasters, or third party damage can result in potentially catastrophic events from gas release into the atmosphere. Partners reported automating shutoff of a ruptured gas service line by installing excess flow valves.

The excess flow valve responds to the high pressure differential, created when a line is severed, by snapping shut to stop the flow of gas. Therefore, the amount of gas that would have otherwise escaped into the atmosphere in the event of a rupture is retained within the closed system. The valves do not protect against slow leaks such as those caused by corrosion or loose fittings.

Operating Requirements

Excess flow valves should be tested and proven at the time of installation and at periodic intervals not to exceed one year.

Applicability

These safety valves may be applied to all gas service lines.

Methane Emissions

The amount of avoided methane emissions is a function of the service line diameter and pressure. Based on the formula in the *Pipeline Rules of Thumb Handbook* (4th Edition, page 278), 16 Mcf per hour is emitted from a ½ inch service line at 50 psig. This is the estimated hourly gas savings when an excess flow valve is activated in response to a rupture along the service line.

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

Applicable Sector(s)

- Production
- Processing
- Transmission
- Distribution

Other Related Documents:

None

Economic and Environmental Benefits

Methane Savings

Estimated annual methane emission reductions *160 Mcf per installation of 350 excess flow valves*

Economic Evaluation

Estimated Gas Price	Annual Methane Savings	Value of Annual Gas Savings*	Estimated Implementation Cost	Incremental Operating Cost	Payback (years)
\$7.00/Mcf	160 Mcf	\$1,200	\$6,300	\$0	6 Years
\$5.00/Mcf	160 Mcf	\$850	\$6,300	\$0	8 Years
\$3.00/Mcf	160 Mcf	\$510	\$6,300	\$0	13 Years

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

Additional Benefits

- Avoidance of catastrophic events in gas service lines

Install Excess Flow Valves (Cont'd)

Economic Analysis

Basis for Costs and Emissions Savings

Typical methane emissions reductions of 16 Mcf per year, costs, and payback apply to installing 350 excess flow valves, of which 1 is activated in a year. The valves are installed on a 50 psig, ½ inch service line.

One partner reported the capital cost of an excess flow valve to be approximately \$18 per valve. By installing 350 valves, the cost would be approximately \$6,300.

The same partner reported emissions savings of 0.46 Mcf per excess flow valve installed, which is approximately 160 Mcf in savings from installing 350 excess flow valves.

Discussion

The primary consideration for companies when installing excess flow valves is to avoid catastrophic events, not reduce methane emissions. The economics of this PRO are based on the assumption that excess flow valves are installed on new and replacement high-pressure service lines.

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 %