

Replace Burst Plates with Secondary Relief Valves



Partner Reported Opportunities (PROs)
for Reducing Methane Emissions

PRO Fact Sheet No. 612

Applicable sector(s):

Production Processing Transmission and Distribution

Partners reporting this PRO: Texaco (now ChevronTexaco Corporation)

Other related PROs: Test and Repair Pressure Safety Valves, Install Flares

- Compressors/Engines
- Dehydrators
- Pipelines
- Pneumatics/Controls
- Tanks
- Valves
- Wells
- Other

Technology/Practice Overview

Description

Rupture Discs, or "Burst Plates," are a low capital cost alternative to pressure relief valves, for the protection of process equipment when gas pressures rise to levels exceeding the maximum allowable operating pressure. These burst plates are for one-time use only. If the calibrated metal membrane (burst plate) is broken by excessive gas pressure, significant amounts of methane, along with volatile organic compounds (VOCs), and hazardous air pollutants (HAPs), vent to the atmosphere until the device is manually blocked-in and the broken plate replaced with a new plate.

One partner has reported installing secondary pressure relief valves (PRVs) on burst plates to reduced methane emissions. The pressure relief valve will open when the burst plate breaks, and then automatically close when the gas pressure returns to safe levels. Installing PRVs on top of burst plates has the dual benefits of reducing fugitive leaks while the burst plate is intact, and minimizing gas release during pressure surges.

Operating Requirements

The PRVs have to pass the ASME Code 26 and Department of Transportation's pressure relief valve requirements.

Applicability

PRVs added in conjunction with burst plates are most advantageous at unmanned sites that may be prone to pressure surges.

Methane Emissions Reductions

The methane emissions reductions can be estimated using vendor's data, which is readily available for any size burst plate and pressure rating (e.g., 8,000 scf per minute for a 2-inch burst plate operating at 150 psig).

Methane Savings: 500 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 a primary justification for the project.

Economic Analysis

Basis for Costs and Savings

Methane emissions reductions of 500 Mcf per year apply to a single incident of rupturing a 2-inch burst plate on a 150 psig system and venting gas continuously for 1 hour until manually blocked in and replaced.

Discussion

The primary benefit of this PRO is to save natural gas. The capital costs are based on installing a pressure relief valve on top of a rupture disk. The maintenance costs are for inspecting the valve once a year for leakage. The payback is based on the vented gas savings.