

PERFORMANCE STUDIES

Field Reports from Cook Compression

GAS FLOW MEASUREMENT
REPORT# 106

Accurate Measurement of Packing Case Leakage Pinpoints Solutions

SCENARIO

Precise gas flow measurement is critical for emissions reporting compliance and for proactive monitoring of packing condition. However it can also play an essential role in identifying leakage problems, their costs and the relative value of proposed solutions.

A transmission plant in the Four Corners region was experiencing significant gas leakage from packing cases in an Ingersoll Rand RDS two-throw compressor. However, maintenance personnel had no reliable way of measuring how much gas was escaping. They were therefore unable to determine the severity of the problem or evaluate the costs of repairs or upgrades required to reduce leakage.

Plant personnel contacted Cook Compression to investigate the leakage problems and recommend a solution.

SOLUTION

Accurate flow measurement was the first critical step. The Cook team used a high-accuracy thermal mass flow meter to measure leakage rates. To properly measure the pipeline quality methane from the compressor, the flow meter was calibrated for methane, propane and ethane mix.

Distance piece measurements were taken on Unit 1 with the compressor in static (pressurized) state. On Unit 2, packing case vent measurements were taken in static (pressurized) state and with the compressor running (fully loaded). Due to shutdown concerns, measurements were taken only on Cylinder 1 of Unit 2. Table 1 shows the results of the flow measurement study.

RESULTS

The study determined that the operator was losing over \$98,000 per year in gas leakage. This data allowed maintenance personnel to make an accurate cost savings assessment for the proposed solution.

Cook Compression recommended an upgraded rod ring set featuring a high-performance pressure breaker, seal rings and vent ring. The cost analysis using estimated information showed that a payback could be realized in 23 months for Unit 1 (static), 4 months for Unit 2 (static) and 4 months for Unit 2 – cylinder 1 (running).

The customer followed Cook Compression's recommendations and has achieved the cost savings predicted. The flow meter was an essential tool that provided the data necessary to quantify not only the cost of the problem, but the value of the solution.



	Unit 1 Static Total	Unit 2 Static Total	Unit 2 – Cylinder 1 - Running Total
Measured Leakage	2.065 SCFM	14.23 SCFM	6.369 SCFM
Approximate Annual Value of Leaked Gas	\$8,939	\$61,621	\$27,584

Table 1. Total leakage and dollars lost due to leakage based on \$8 per decatherm and constant leakage.



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