

# Review of Compressor Station Measurements

Measurement Project Update  
September 7, 2010



# Project Management

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# Agenda for Today

- **Review Project Goals**
- **Review Recent Findings and Phase 1 Interim Report**
- **Review Recommendations and Discuss Future Actions**

# Overall Project Goals

(from initial project report in 2008)

- Update emission factors for
  - **Production:** Well clean-ups, completion flaring, well workovers, pipelines leaks
  - **Processing:** fugitive emissions from reciprocating and centrifugal compressors
  - **Transmission and Storage:** *fugitive emissions from reciprocating and centrifugal compressors*, pneumatic devices, and M&R stations
  - **Distribution:** Residential customer meters, plastic mains and services (*Note: GTI is doing some of these*)

# Stations Visited To Date

Ownership	Date Visited	Description	IR screening?	Hi Flow on component leaks	Vent Pipes Measured
Co #1	11/3/09 TX	6 Recips (1965)	√	√	√
Co #1	11/4/09 TX	5 Recips (‘92 – ‘09)	√	√	√
Co #1	11/3/09 TX	3 Centrif (1982)	√	√	√
Co #2	2/23/10 W. TX	15 Recips	√	√	√
Co #2	2/24/10 NM	8 Recips (1950’s)	√	√	√

# Compressor Blowdown OEL's

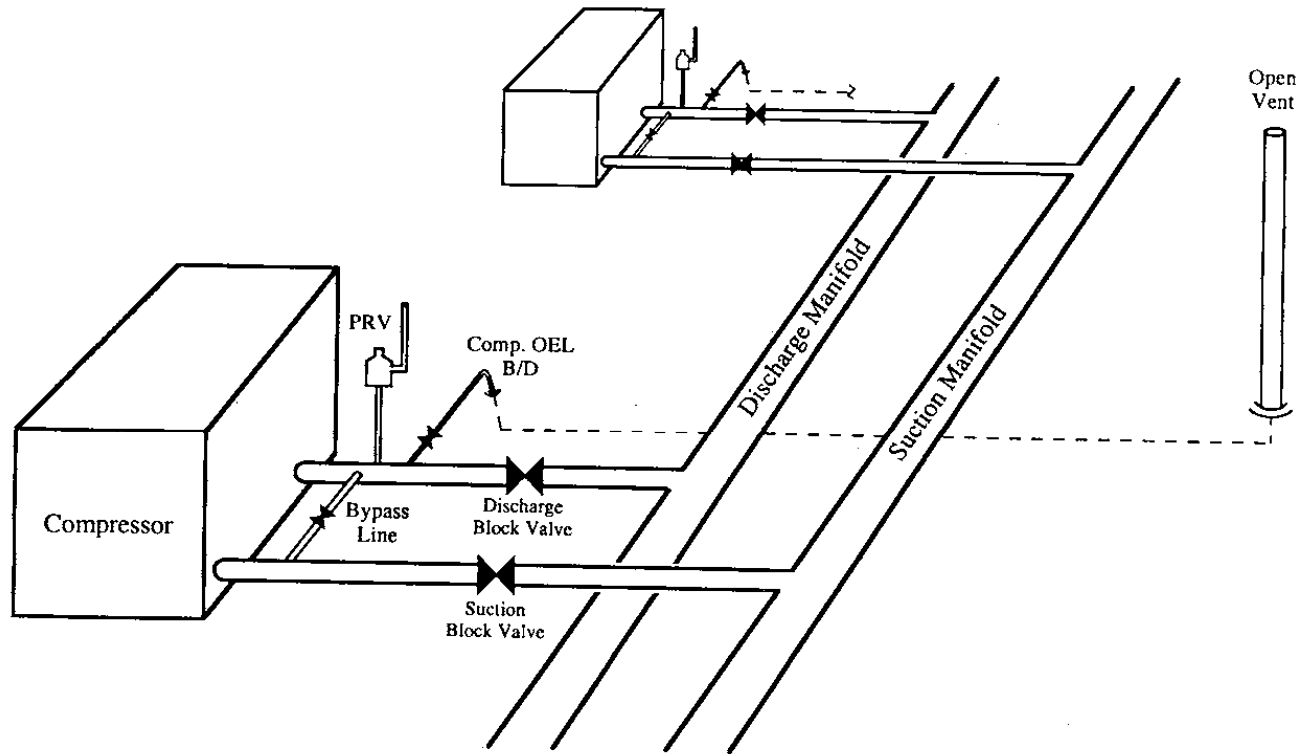


Figure 4-1. Illustration of Compressor Blowdown Valve Arrangement

# Results

(vent measurements, 2 stations)

	Mscfy	GRI/EPA Mscfy per compr.
Average BD vent for IDLE (recip)	14347	3683
Avg BD vent for RUNNING (recip)	8807	
Avg Packing Vent RUNNING	13798	396

# Results

(vent measurements, last 3 stations)

	Mscfy	GRI/EPA Mscfy per compr.
Average BD vent for IDLE, recip	699	3683
Avg BD vent for IDLE+RUN, centrif	15787	
Avg Packing Vent <b>IDLE</b>	8379	396



# Compressor Miscellaneous Fugitives

(valves, flanges, etc; all stations)

	Mscfy per compr.	GRI/EPA Mscfy per compr.
Pressurized idle	60	
Operating	48	
Average	52	180

# GRI/EPA Study

- Operation Info
  - Recip Compressors were Pressurized 79.1% of time
  - Centrifugal Compressor were Pressurized 24.2% of time
  - Based on FERC, GRI TRANSDAT, Field data from one large transmission company, and practices observed during GRI/EPA campaign
- Measurement Basis:
  - 6 Storage stations (5 national storage companies)
  - 15 transmission stations

# Comments

## Comparison to GRI/EPA Data

- Comparison Basis: The GRI/EPA data is from Table 4-15 of "Methane Emissions from the Natural Gas Industry: Volume 8".
- **REDUCES the EF for packing vents for recips**
  - Co #1 = 8739, which is lower than Co #2's 13798 Mscf/yr. Both of these are larger than the prior EF from the GRI/EPA study of 396 Mscf/yr.
  - Note: Co #1 keeps idle compressors pressurized. We were only able to measure idle compressors (no recips were running during the recent visits)

# Comments (cont'd)

## Comparison to GRI/EPA Data

- **REDUCES** the EF for **BD vents** (at least for idle recipis)
  - Co #1 measurement averages to only 699 Mscfy vs 14347 for Co #2 and vs 3683 for GRI/EPA.
  - This is expected, as Co #1 keeps compressors pressurized, meaning the only possible leak is the 2" BD valve, rather than the big suction and discharge valves when the compressor is depressurized.
  - Other large leaker from the GRI/EPA study for compressors, PRV's at 372 Mscf/compr/yr may need to be added to the GRI/EPA value for comparison since Co #2 sites had both routed to the elevated BD line stack. Even with that addition, the new data is still higher.
- **RAISES** the EF for **BD vents** (for centrifugal)
  - Co #1's centrifugal average BD leak is much larger at 15787 Mscfy/compressor

# Measurement Comments

There are a few observations to make:

1. Not all vents are accessible, or safely accessible
2. Some vents are joined, and when different equipment in different operating modes are joined to the same vent, we cannot produce the stratified EF's that we are after.

# Photos from Recent Visits

## (3 stations)

- 3 stations previously visited for normal fugitives
- Large design variability
- Need to customize approach for measurement of vents at each site

# Future Path Options

- With Remaining Budget:
  - A) re-scope to focus on all compressor station components, add as many as possible (X stations)
  - B) re-scope to focus on vents only and add as many compressor stations as possible (>X)
  - C) start other sectors
- Ultimate Goal (Additional Budget Required):
  - Measure 12-15 compressor stations, update EF's
  - Measure Distribution source target?
  - Measure Production source target?

# Some Conclusions

- More Sampling Needed
  - Station Design....each is unique
- EPA GHG MRR Subpart W may have a large effect on this program. Direction of the final rule should be monitored.
- **Recommendations**
  - Measure more sites with remaining budget
    - Target 1-2 companies, 5-6 more stations
  - Vent Measurements and Fugitive (IR + High Flow)
  - Potentially Survey INGAA members for company practices on items affecting leak rate
  - Convene Stakeholders



# Path Forward ?

- Convene Stakeholders and verify mission and funding.
- Gather more direct measurement data (Measure more compressor station sites and gas plant sites) Target: 6-10 more stations geographically diverse.
- Survey INGAA members for company practices on compressor operating practices that affect leak rate
- Produce and publish updated compressor emission factors.