

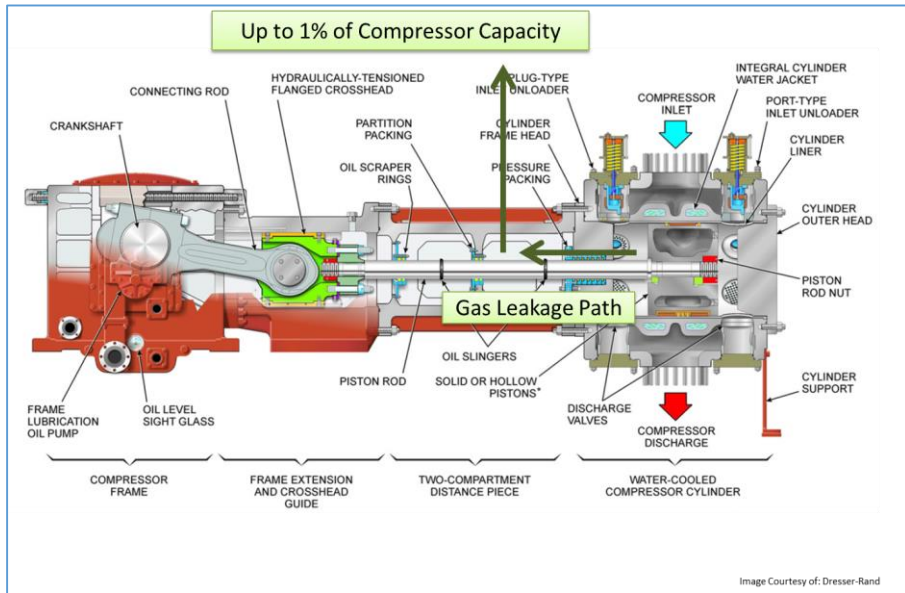
# Methane Emissions Measurement and Reduction

SwRI provides technical recommendations to reduce facility total and point source emissions and help clients with government regulatory compliance

Sarah Simons



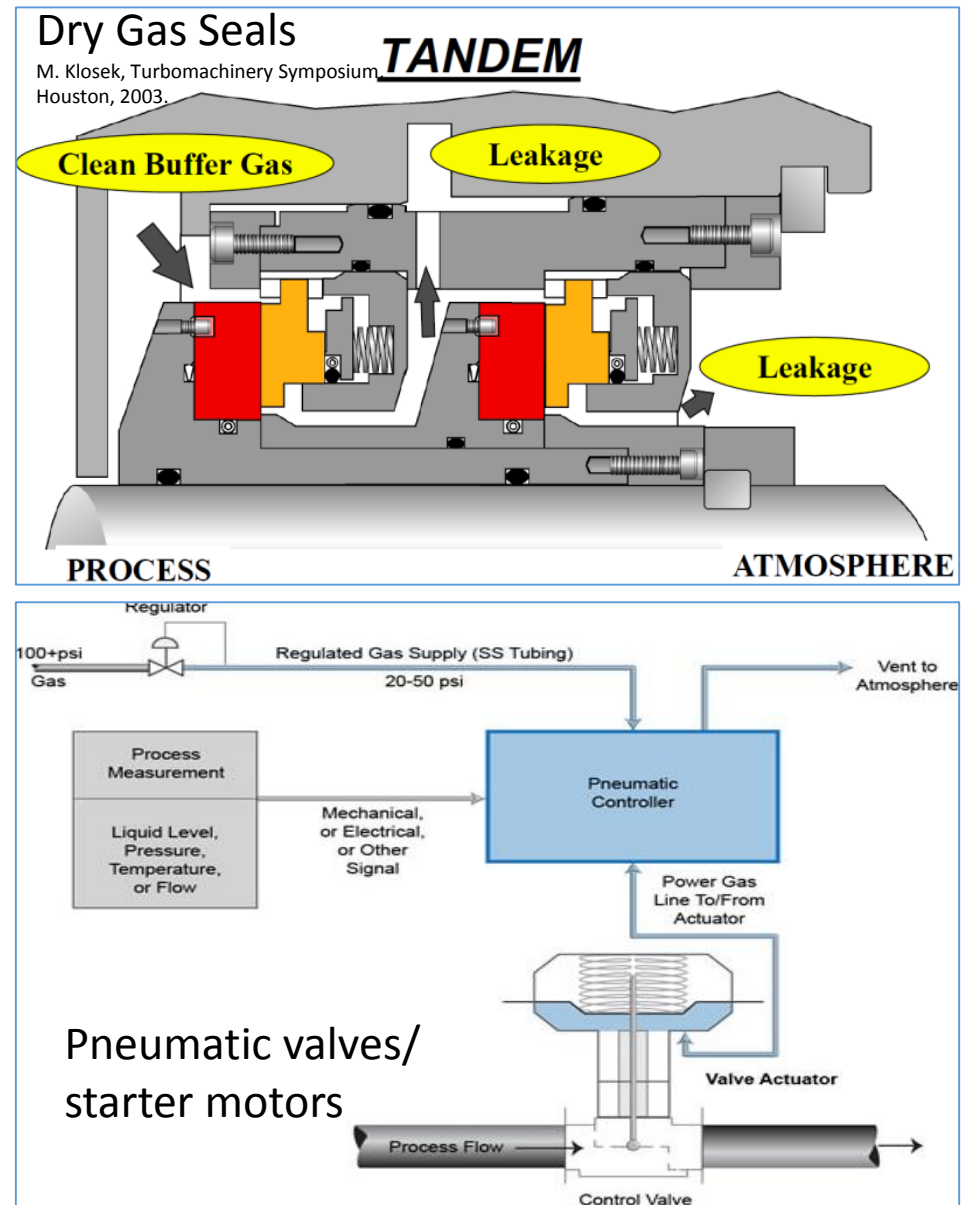
# Station Leak Paths



Reciprocating Compressor Packing

## Other Sources:

- Storage Vessels
- Leaks
- Operating Scenarios
  - Maintenance vents
  - Forced vents
  - Pressurized hold
  - Unburned hydrocarbons from driver



# Emissions Measurements

Global review of area using drone or visual optical detectors

Identify point sources such as:

- Pneumatic Starters On Gas Turbines Or Engines
- Valves
- Centrifugal seals
- Cold Vents/Flares
- Recip Packing
- Storage Vessels

Detailed measurement and characterization of the leakage flow of each point source using flow meters or pressure transducers

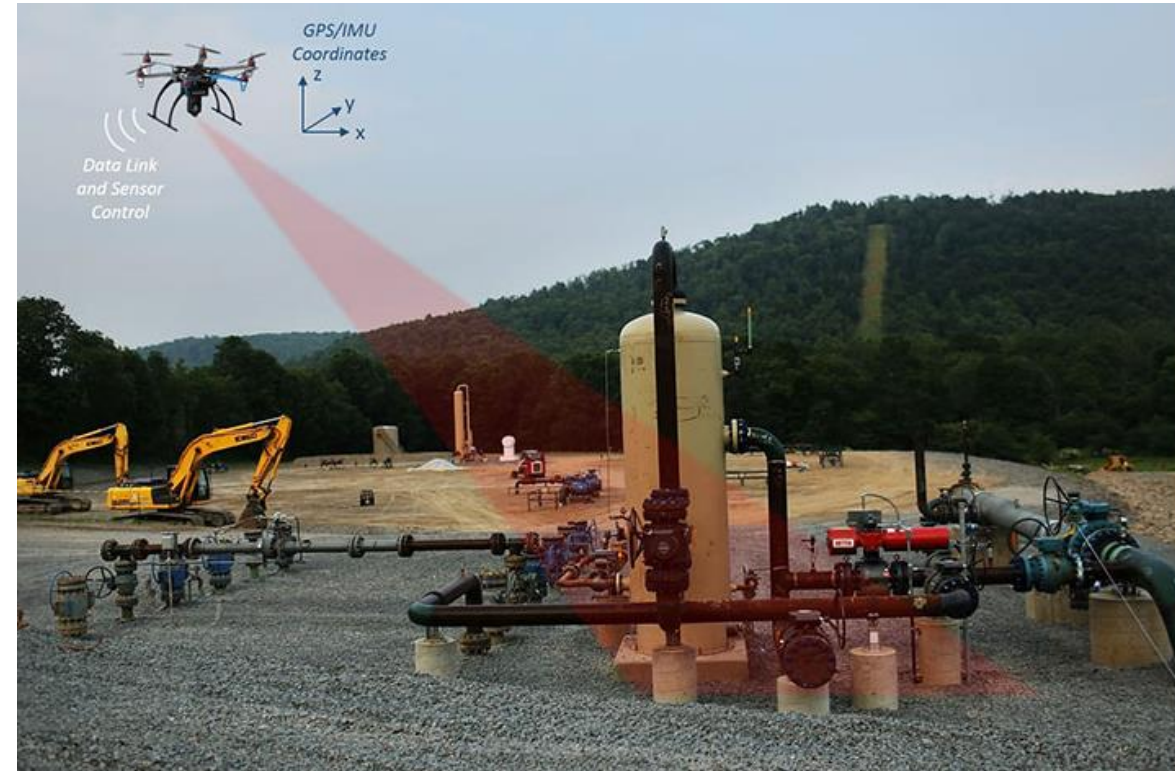


Image Courtesy of: [gpsworld.com](http://gpsworld.com)

# Emissions Reductions

1. Review maintenance records and procedures—blowdowns, pressurized holds, shutdown procedures and instrumentation errors.
2. Make remedial recommendations such as:
  1. Re-routing vent lines
  2. Improved packing rings or low leakage rings for recip compressors
  3. Low leakage pneumatic controllers
  4. Alternate station procedures for shutdowns or maintenance



# Dry Gas Seal Design Review

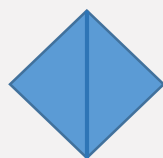
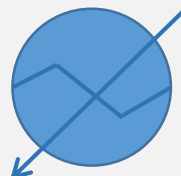
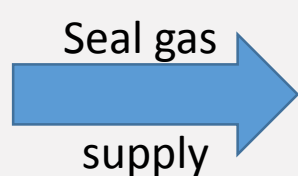
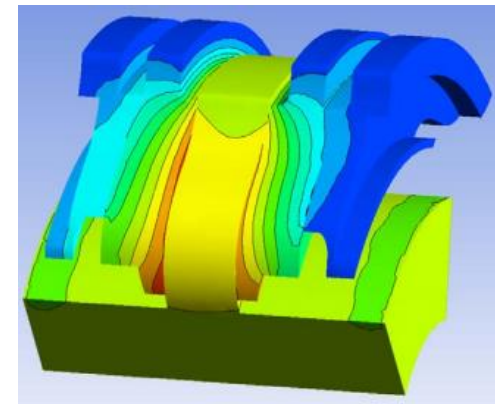
## Purpose:

Minimize process gas leakage to atmosphere

Reduce risk of damage due to contamination (reducing blowdown events)

## Can include the following:

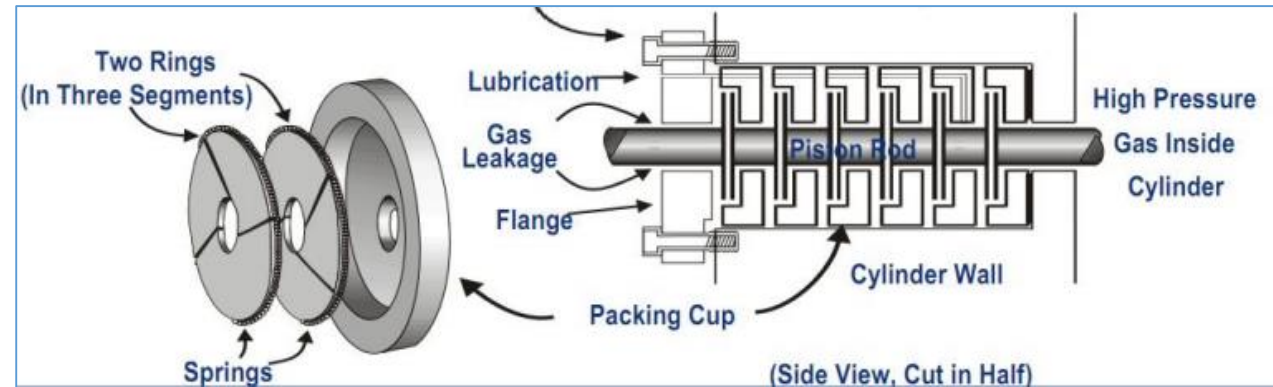
- Supply System Flow Analysis
- Correct Seal Type
- Phase Map Analysis
- Supply Gas Filtration
- Assessment of Instrumentation, Control, and Operation



# Recip Seal Packing Design Review/Inspection

## Purpose:

Minimize process gas leakage to atmosphere



Can include the following:

- Measure leakage during primary operating conditions
- Develop Maintenance or Replacement Plan/Life Evaluation
- Assessment of Operating Scenarios
- Evaluate options for reducing leakage—improved seal design, capturing, storage/flaring

# Service Package

- Global and local assessment of natural gas emissions from all compressor station sources
- Point source characterization
- Recommendations for emissions reductions
  - Equipment replacement or repair options
  - Capture options
  - Improved maintenance practices to reduce ventings and shutdowns
- Typical project duration less than 2 days with no interruption to operations