



Delivering Energy to Improve Lives

Summary of Kinder Morgan Technical Testimony: Compressor Seals (Section 114)

Proposed Rule 20.2.50 – Oil and Gas Sector – Ozone Precursor Pollutants
Commencement of Hearing: September 20, 2021

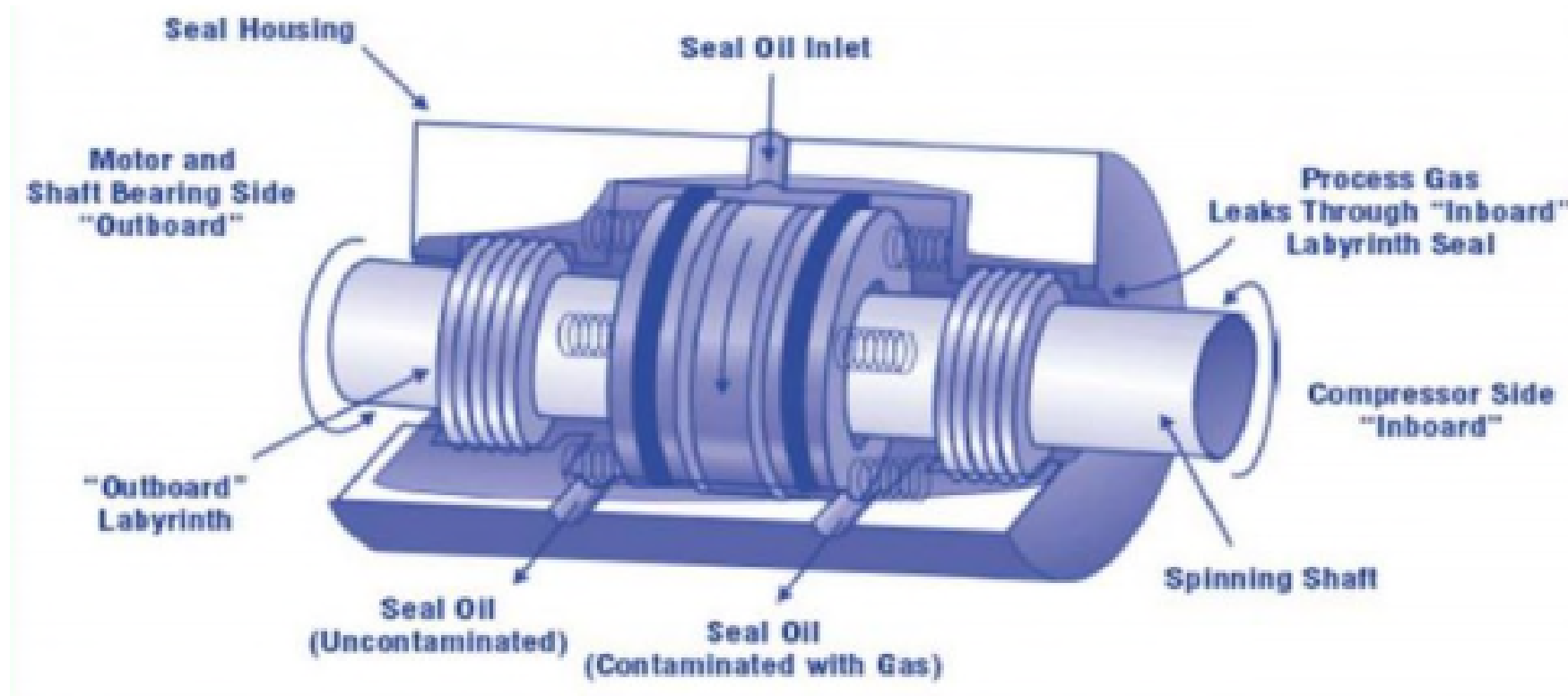
- Vincent Brindley, Technical Supervisor, Kinder Morgan
- Resume and qualifications at Exhibit II of the Kinder Morgan NOI to Present Direct Technical Testimony

- Centrifugal compressors using wet seals
- Gas composition of natural gas in the transmission segment
- VOC emissions data from wet seals
- Estimated costs for replacement to dry seal
- Operational concerns with replacement to dry seal

The ask:

Accept NMED's September 16 draft applicability language to clarify that transmission compressor stations are not subject to Section 114

Centrifugal compressors using wet seals



Source: NMED NOI Direct, Ex. 32; Natural Gas Star, Wet Seal Degassing Recovery System for Centrifugal Compressors,
<https://www.epa.gov/sites/default/files/2016-06/documents/capturemethanefromcentrifugalcompressionsealoiddegassing.pdf>

Transmission Segment VOC Content

- The VOC content of the pipeline quality natural gas transported by Kinder Morgan is extremely low
 - The average annual VOC content at all evaluated stations is less than 1%, and, at one station, was as low as 0.206%.

EPNG REPRESENTATIVE GAS QUALITY IN NM
SUMMARY OF ANNUAL AVERAGE VOC CONTENT

Transmission Compressor Station	Annual* VOC Content by Weight
Caprock	0.775%
Eunice	0.206%
Monument	0.820%
Rio Vista	0.633%
Washington Ranch	0.436%

* For July 2020 to July 2021.

VOC emissions from wet seals

- Detailed analysis of data shows that most of Kinder Morgan’s centrifugal wet seals emitted 0 or close to 0 tpy of VOC and the seal with the *highest* emissions was approximately 0.92 tpy of VOC.

Kinder Morgan Data

2018 data set

US Tons Per Year
Vent VOC
[Note: *]

0.00950
0.00000
0.00000
0.00792
0.01821
0.00000
0.00000
0.02920
0.03019
0.00059
0.00000
0.00010
0.09174
0.02712
0.03771
0.00030
0.04285
0.01198
0.07383
0.02821
0.02702
0.00000
0.00000
0.00000
0.00000

2019 data set

US Tons Per Year
Vent VOC
[Note: *]

0.00000
0.00000
0.01157
0.00000
0.00000
0.00000
0.00061
0.01905
0.00000
0.01891
0.02117
0.00000
0.00453
0.03162
0.00274
0.00000
0.00142
0.00070
0.02225
0.01269
0.01727
0.00000
0.00000
0.00000
0.00000

2019 GHG RP data set

TPY VOC	
0.22	
0.23	
0.27	
0.27	
0.37	
0.72	
0.87	
0.99	
1.11	
1.26	
2.31	
4.53	

NMED Data from the EPA FLIGH Tool

- Control is not a likely option.
 - High cost compared to low emissions benefit.
- Cost to replace wet seal with a dry seal is very high.
 - \$1,400,000, Solar Saturn unit
 - \$1,561,100, three Ingersoll Rand CVS-24 overhung compressors
 - >\$1,000,000, Cooper Bessemer RFBB-20 barrel style compressor

In brief: This requirement would not be cost-effective for transmission compressor stations.

Operational concerns with replacement to dry seal

- Conversion of a wet seal to a dry seal can cause potential negative implications that generate additional costs
 - Dampening benefit of the wet seal is lost when converted
 - This would result in system evaluation and additional modifications to avoid unsafe vibrations (recall how large these units are)



- Accept NMED's September 16 draft applicability language to clarify that transmission compressor stations are not subject to Section 114, as shown below:

20.2.50.114 COMPRESSOR SEALS:

A. Applicability:

(1) Centrifugal compressors using wet seals and located at tank batteries, gathering and boosting stations, and natural gas processing plants are subject to the requirements of 20.2.50.114 NMAC.

Centrifugal compressors located at well sites and transmission compressor stations are not subject to the requirements of 20.2.50.114 NMAC.

(2) Reciprocating compressors located at tank batteries, gathering and boosting stations, and natural gas processing plants are subject to the requirements of 20.2.50.114 NMAC. Reciprocating compressors located at well sites and transmission compressor stations are not subject to the requirements of 20.2.50.114 NMAC.

Questions?