



COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
COMMONWEALTH KEYSTONE BUILDING
400 NORTH STREET, HARRISBURG, PA 17120

BUREAU OF
INVESTIGATION
&
ENFORCEMENT

July 8, 2021

Via Electronic Filing

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

Re: Pennsylvania Public Utility Commission,
Bureau of Investigation & Enforcement v.
Sunoco Pipeline, L.P. a/k/a Energy Transfer Partners
Docket No. C-2018-3006534
Public Summary of Remaining Life Study

Dear Secretary Chiavetta:

Pursuant to Ordering Paragraph 2 of the Pennsylvania Public Utility Commission's ("Commission") Opinion and Order entered on August 19, 2020 in the above-referenced matter, enclosed please find the public summary of the Remaining Life Study related to the Mariner East 1 pipeline.

Copies have been served on the parties of record in accordance with the Certificate of Service.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Stephanie M. Wimer', is written over a light blue horizontal line.

Stephanie M. Wimer
Senior Prosecutor
PA Attorney ID No. 207522
(717) 772-8839
stwimer@pa.gov

Enclosure

cc: Honorable Elizabeth H. Barnes, OALJ-Harrisburg (*via e-mail only*)
Michael L. Swindler, Deputy Chief Prosecutor (*via e-mail only*)
As per Certificate of Service



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Mariner East 1 Remaining Life Study

Energy Transfer/Sunoco Pipeline

1 INTRODUCTION

8 Following the finalization of its settlement agreement with the Pennsylvania Public Utility Commission's (PAPUC) Bureau of
9 Investigation and Enforcement (BI&E), Energy Transfer/Sunoco Pipeline, L.P. (SPLP) requested DNV GL USA, Inc. (DNV)
10 serve as an independent expert in a review of the Mariner East 1 (ME1) pipeline segment.

11 As the independent expert, DNV conducted a Remaining Life Study consisting of a remaining life evaluation of the Mariner
12 East 1 (ME1) pipeline for the threat of corrosion, calculations supporting the remaining life evaluation, and is forward-looking
13 in manner and intended to assess the longevity of ME1 related to corrosion. Line pipe in crude oil, refined products, NGL,
14 and natural gas service does not have a defined life expectancy. When properly maintained, steel line pipe can operate for
15 an indefinite period of time. The remaining lives described herein refer to the calculated time for ILI reported anomalies to
16 reach specific criteria.

17 The following is a summary of the Mariner East 1 Remaining Life Study performed by DNV.

2 OPERATION HISTORY

2.1 Pipeline Configuration

20 SPLP reconfigured several legacy Sunoco Logistics (SXL) line segments for the transportation of Natural Gas Liquids (NGL)
21 from Delmont to the Twin Oaks station.¹ This involved a change in product from refined products to NGLs, an increase in
22 maximum operating pressure, and a reversal of flow direction.

2.2 Cathodic Protection History

24 The ME1 pipeline utilizes impressed current cathodic protection (CP) systems incorporating conventional anode beds, deep
25 well anodes, and linear anodes. In addition, certain sections of abandoned pipe are utilized as sacrificial anodes.

26 As-built records provided by SPLP show the first CP system was installed in 1949.

2.3 Coating History

28 A variety of external coatings are in use on the ME1 pipeline. The predominate coating types are Coal Tar Enamel, Pritec
29 two-layer polyethylene, and Fusion Bond Epoxy (FBE). A review of records provided by SPLP shows each coating type
30 corresponding to various vintages, wall thickness, and grades of line pipe which is indicative of pipe coating application at the
31 time of construction: the transition from Coal Tar (1930s) to Pritec (1970s) and ultimately to FBE (2000s). Pipe reconditioning
32 projects have occurred periodically over the life of the pipeline.

33

¹ The ME1 system is comprised of segments previously owned and operated by Arco Pipe Line Company, Atlantic Pipe Line Company, and Sun Pipe Line Company.



34 **2.4 Leak History**

35 Leak history for the ME1 system was compiled from publicly available PHMSA records and documentation provided by SPLP.
36 Only leaks from line pipe were considered as part of this remaining life study.

37 In general, the number of small releases is consistent with vintage pipe operated before the widespread use of cathodic
38 protection and in-line inspection (ILI) and consistent with pipeline industry experience. The frequency and volume of releases
39 on ME1 drops significantly beginning in the mid-1960s which corresponds with the widespread installation of cathodic
40 protection and completion of pipe reconditioning work. Initial ILI assessments to address the threat of external corrosion within
41 the legacy assets were conducted in the early 1970s with re-assessments generally occurring in the early 1990s. The number
42 of third party damage incidents decreases in the late 1970s corresponding to the implementation of the state-wide one call
43 system in 1977. Leak trend data also shows a reduction in leak frequency again in the 2000s following PHMSA's final
44 rulemaking for Integrity Management in High Consequence Areas.

45 **3 CORROSION GROWTH RATE AND REMAINING LIFE ANALYSIS**

46 DNV established corrosion growth rates (CGRs) on a per joint basis for each of the five pipeline segments in the ME1 pipeline
47 system using its proprietary CGReal methodology. Remaining lives were calculated based on the time required (corrosion
48 growth rate plus ILI bias adjusted anomaly depth) for an anomaly to meet 49 C.F.R Part 195.452 criteria for an immediate
49 repair condition.

50 **4 REMEDIATION PLAN**

51 Line pipe in crude oil, refined products, NGL, and natural gas service does not have a defined life expectancy. When properly
52 maintained, steel line pipe can operate for an indefinite period of time. Pipe may be replaced or retired based on operational
53 needs such as an increase in operating pressure or due to degradation beyond design operating limits by time dependent
54 mechanisms such as corrosion. Pipe may also be replaced to accommodate changes in land use such as relocations for
55 roadways or development.

56 Pipeline anomalies such as metal loss or dents, when identified through integrity assessments, may also be monitored for
57 changes in condition during future assessments and addressed through preventive measures such as cathodic protection,
58 internal corrosion inhibitor injection, or pressure cycle management. The identification of anomalies and determination of
59 remaining life can best be described as a snapshot in time and predictive of future state if conditions remain un-mitigated.

60 Using the results of the corrosion growth and remaining life analyses, DNV identified two specific pipe joints within two pipe
61 segments for preventive measures, monitoring during subsequent integrity assessments, or consideration in a potential
62 remediation (repair or replacement) schedule. For each of the five pipeline segments, DNV identified three 100-ft sections for
63 which, if subject to preventive measures, additional assessment, or remediation, will have the most significant impact on the
64 remaining life of each segment.

65 **5 RETIREMENT SUMMARY**

66 SPLP reports that various pipe replacement programs were executed in the 1970's, 1980's and early 1990's following ILI
67 surveys. Additionally, and as part of the Mariner East project, SPLP conducted assessments of the pipeline prior to the change
68 in product. SPLP also performed hydrostatic pressure tests, inclusive of spike tests, as part of the conversion process for the
69 Mariner East project. Line pipe replacements were included in SPLP's repair plan prior to the change in product, which was
70 executed in 2013 and 2014.

71



72 **6 THREAT AND RISK MITIGATION OVERVIEW**

73 DNV reviewed key parts of the most recent risk analysis performed by SPLP of the ME1 pipeline for the purpose of
74 understanding the threats identified by SPLP for the ME1 pipeline and to confirm that the risk assessment meets minimum
75 regulatory requirements as specified in 49 C.F.R Part 195. DNV concluded that SPLP's risk assessment includes the
76 threats and risk factors contained in regulatory guidance.

77 DNV also reviewed the preventative and mitigative measures identified and implemented by SPLP for the ME1 pipeline
78 within the last 10 years for the identified threats. Mitigative measures to address the potential consequence of a release
79 were also reviewed. SPLP employs Public Awareness; Monitoring, Safety & Security; Leak Detection; and Corrosion
80 Control programs as preventive and mitigative measures for risks identified on the ME1 pipeline system as presented in
81 DNV's Remaining Life Study.

82 **7 DEGRADATION THREAT OVERVIEW AND PIPELINE LIFE MANAGEMENT**
83 **FOR THE PIPELINE INDUSTRY**

84 Line pipe in crude oil, refined products, NGL, and natural gas service does not have a defined life expectancy. When properly
85 maintained, steel line pipe can operate for an indefinite period of time. Pipeline features such as metal loss anomalies, dents,
86 and ovalities may be introduced to pipelines during original construction or during the course of operations. To manage the
87 degradation threats to pipeline assets, pipeline operators employ a variety of measures such as post-construction acceptance
88 testing, periodic integrity assessments, and pipeline repairs, and preventive and mitigative measures such as one-call
89 participation and right-of-way monitoring.

90 Various strategies used by pipeline operators to manage pipeline threats in support of an unbounded asset life expectancy
91 are presented and discussed in DNV's Remaining Life Study.

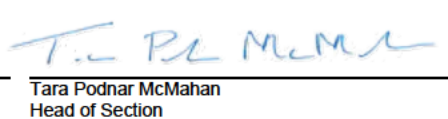
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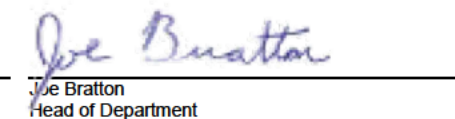
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**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Pennsylvania Public Utility Commission, Bureau of Investigation and Enforcement, Complainant,	:	
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	:	
v.	:	Docket No. C-2018-3006534
	:	
Sunoco Pipeline, L.P. a/k/a Energy Transfer Partners, Respondent	:	

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the parties, listed below, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a party).

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Dated: July 8, 2021