U.S. Department
of Transportation

Pipeline and Hazardous Materials
Safety Administration

1200 New Jersey Ave., SE
Washington, DC 20590

OCT 10 2019

Mr. Stanley Chapman, III
Executive Vice President and President
U.S. Natural Gas Pipelines
TC Energy
700 Louisiana Street, Suite 700
Houston, Texas 77002

Re: CPF No. 1-2018-1016S

Dear Mr. Chapman:

Enclosed please find the Safety Order issued in the above-referenced case. It makes a finding that the pipeline system of your subsidiary, Columbia Gas Transmission, LLC, has a condition or conditions that pose a pipeline integrity risk and specifies actions that must be taken to ensure that the public, property, and the environment are protected from the risk. When the terms of the order have been completed, as determined by the Director, Eastern Region, this enforcement action will be closed. Your receipt of the Safety Order constitutes service of the document, as provided under 49 C.F.R. § 190.5.

Thank you for your cooperation in this matter.

Sincerely,

Alan K. Mayberry
Associate Administrator
for Pipeline Safety

Enclosure

cc: Mr. Robert Burrough, Director, Eastern Region, Office of Pipeline Safety, PHMSA
Mr. Lee Romack, Manager, U.S. Regulatory Compliance, TC Energy, 700 Louisiana Street, Suite 700, Houston, Texas 77002
Mr. Randal Broussard, Senior Vice President, U.S. Gas Operations East, Columbia Gas Transmission, LLC, 201 Energy Parkway, Suite 100, Lafayette, Louisiana 70508

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
OFFICE OF PIPELINE SAFETY
WASHINGTON, D.C. 20590

In the Matter of	)	
Columbia Gas Transmission, LLC, a subsidiary of TC Energy,	)	**CPF No. 1-2018-1016S**
Respondent.	)	

SAFETY ORDER

Pursuant to Chapter 601 of Title 49, United States Code, the Pipeline and Hazardous Materials Safety Administration (PHMSA), U.S. Department of Transportation, initiated an investigation and information review of the safety of Columbia Gas Transmission, LLC's (CGT) Leach Xpress (LEX) gas pipeline system. CGT is a subsidiary of TC Energy (collectively, Respondent).[1] The investigation was initiated after PHMSA was notified, on June 7, 2018, of a reportable incident that occurred on the LEX pipeline system, which resulted in the release of approximately 165 million cubic feet (MMCF) of natural gas, an ignition of natural gas, and a fire (Failure). The Failure resulted in the ejection of approximately 83 feet of 36-inch diameter pipe from the ditch onto the right of way. The Failure occurred in a remote, Class 1 rural location, and there were no reported injuries, fatalities or evacuations. The cause of the Failure has not yet been determined.

As a result of the investigation, and pursuant to 49 U.S.C. § 60117(1), the Director, Eastern Region, OPS (Director), issued a Notice of Proposed Safety Order (Notice) to CGT on July 9, 2018, proposing certain measures be taken to ensure that the public, property, and the environment are protected from identified integrity risks related to the Failure. The Notice notified Respondent of the preliminary findings of the investigation and proposed that Respondent take certain measures to ensure that the public, property, and the environment are protected from the integrity risk of LEX related to the Failure.

On August 8, 2018, TC Energy responded to the Notice on behalf of CGT (Response).[2] In the Response, Respondent did not contest the proposed findings or remedial requirements contained in the Notice, but provided an update on the work it had completed to date to ensure the safe

[1] *See*, TC Energy Website, *available at* https://www.tcenergy.com/operations/natural-gas/columbia-gas-transmission/ (last accessed October 3, 2019).

[2] In May 2019, TransCanada Corporation changed its name to TC Energy. *See*, TC Energy Website, *available at* https://www.tcenergy.com/TC-Energy/ (last accessed October 3, 2019).

operation of the LEX. Respondent did request that the Proposed Safety Order requirements be modified based on the work completed and approved by PHMSA to date. In subsequent submissions, including emails dated January 11 and February 22, 2019, Respondent submitted additional documentation of completed actions. Respondent did not request a hearing and therefore has waived its right to one.

FINDINGS OF PIPELINE INTEGRITY RISK

Respondent did not contest the proposed findings in the Notice that its pipeline has a condition or conditions that pose a pipeline integrity risk. Accordingly, pursuant to 49 U.S.C. § 60117(1) and 49 C.F.R. § 190.239, I find as follows:

- Columbia Gas Transmission, LLC, a subsidiary of TC Energy, operates over 10,468 miles of interstate natural gas transmission pipelines, 37 storage fields across four states, and transports an average of three billion cubic feet of natural gas per day through New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Kentucky, North Carolina, and Delaware. Columbia Gas was acquired by TransCanada Corporation in 2016. In My 2019, TransCanada changed its name to TC Energy.

- The failed pipeline is a 36-inch diameter, 130 mile-long line that transports natural gas and runs from Majorsville, Pennsylvania, to Crawford, Ohio. The Failure occurred near milepost (MP) 20.6, approximately seven miles south of Moundsville, West Virginia (Failure Site).

- The Affected Segment runs along several hills and ridges with steep elevation changes. The Failure Site is located on Nixon Ridge.[3]

- The Affected Segment near the Failure Site was constructed in 2017. The pipeline at the Failure Site consists of grade X-70, 36-inch steel pipe with a wall thickness of 0.515" and 0.618". The pipeline has fusion bonded epoxy coating and double submerged arc welded (DSAW) seams. The impressed current cathodic protection system had not been energized, but Respondent was in the process of having it commissioned. Galvanic anodes were installed at foreign lines crossings.

- The maximum allowable operating pressure (MAOP) of the Affected Segment is 1440 pounds per square inch gauge (psig), as established by hydrostatic test in 2017. At the time of the Failure, the actual operating pressure of the pipeline upstream from the Failure was 1280 psig; downstream of the Failure at the Eureka Metering Station, the operating pressure was 1243.7 psig.

- At approximately 4:55 a.m. EDT on June 7, 2018, Respondent discovered a failure on the

[3] "Affected Segment" means the approximately 50 miles of Respondent's 30-inch and 36-inch LEX Pipeline from the upstream Lone Oak Compressor Station (MP 7.2) near Lone Oak, West Virginia within Marshall County through the downstream Summerfield Compressor Station (MP 57.2) near Summerfield, OH in Noble County. The "Affected Segment" generally runs westerly through portions of Noble and Monroe Counties in Ohio, and Marshall County in West Virginia.

LEX pipeline system, as determined by its gas controller, from a pressure drop observation. The incident was determined to be a natural gas release, an ignition of natural gas, and fire in the area of Moundsville, West Virginia. The Failure resulted in the ejection of approximately 83 feet of 36-inch pipe from the ditch onto the right of way, and the loss of 165 MMCF of natural gas. The Failure occurred in a remote, Class 1 rural location. There were no reported injuries, fatalities or evacuations. The Failure was reported to the National Response Center (NRC Report No. 1214458) on June 7, 2018, at approximately 6:12 a.m. EDT.

- Respondent isolated the Affected Segment via manual closure of valves LEX-500, which is a main line valve (MLV) known as MLV 2, and LEX-600 (MLV 3) (Isolated Segment).[4] MLV 2 is located approximately 1.6 miles upstream of the Failure Site and was manually closed at approximately 5:20 a.m. EDT. MLV 3 is located approximately 12.75 miles downstream of the Failure Site and automatically closed at approximately 4:55 a.m. EDT. The upstream Lone Oak compressor station's compressor units were shut down via a command issued from Respondent's Gas Control at approximately 4:36 a.m. EDT. In addition, LEX-700, MLV 4, further downstream from MLV 3, automatically closed at approximately 5:32 a.m. EDT.

- PHMSA, Roberts Ridge Volunteer Fire Department, the West Virginia Department of Environmental Protection, the West Virginia Division of Forestry, and the Federal Energy Regulatory Commission responded to the scene. PHMSA inspectors initiated an investigation of the Failure on June 7, 2018.

- The Isolated Segment, which was shut-in via the closure of MLVs 2 and 3, currently remains out of service.

- On December 12, 2017, Respondent completed a hydrostatic test on "test section LX1-3A" of the LEX pipeline, which includes the location of Failure. The section was successfully tested for a duration of eight hours to a minimum test pressure of 1880 psig. In addition, on December 14, 2017, Respondent ran an Enduro Digital Data Logger Caliper tool from the Taylor B (746+11) launch site near Glen Easton, West Virginia, to Games Ridge (1139+34.9) receive site near Moundsville, West Virginia. The report was generated on December 20, 2017. On May 17, 2018, a combo High-Resolution Magnetic Flux Leakage (HR MFL) + Geo Tool was run with an inertial measurement unit. Respondent did not immediately receive the report from the combo HR MFL + Geo Tool run, but the vendor was asked to provide an expedited preliminary in-line inspection report as soon as practicable due to the Failure.

- Since the Failure, Respondent has identified six other points along the pipeline that, based on their geotechnical flyover, are areas of concern due to the existence of large spoil piles, steep slopes, or indications of slips. Respondent has also performed minor repair work and grading of the Failure Site.

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[4] "Isolated Segment" means the approximately 14.35-mile segment of the LEX pipeline from the upstream valve LEX-500 (MLV 2) at MP 18.5 to the downstream valve LEX-600 (MLV 3) at MP 32. It is the portion of the "Affected Segment" that was shut-in after the failure on June 7, 2018, by closing MLV 2 (upstream of the failure) and MLV 3 (downstream of the failure).

- The PHMSA investigation is ongoing and the cause of the Failure is unknown at this time. The preliminary investigation suggests that the Failure was the result of land subsidence causing stress on a girth weld.

ISSUANCE OF SAFETY ORDER

Section 60117(1) of Title 49, United States Code, provides for the issuance of a safety order, after reasonable notice and the opportunity for a hearing, requiring corrective measures, which may include physical inspection, testing, repair, or other action, as appropriate. The basis for making the determination that a pipeline facility has a condition or conditions that pose a pipeline integrity risk to public safety, property, or the environment is set forth both in the above-referenced statute and 49 C.F.R. § 190.239.

After evaluating the foregoing findings and considering the age of the pipe involved, the hazardous nature of the product transported, the circumstances surrounding the Failure, including the uncertainties of the cause of the Failure and the potential for the conditions that caused the Failure to be present elsewhere on the pipeline system, PHMSA finds that Respondent's LEX gas pipeline system has a condition or conditions that pose a pipeline integrity risk to public safety, property, or the environment. Accordingly, PHMSA issues this Safety Order, which requires that Respondent take measures specified below to address the risk.

CORRECTIVE MEASURES

The Notice proposed certain actions with respect to the Affected Segment. As described below, Respondent has completed certain actions relating to Items 3 and 4.

As for the remaining compliance terms, pursuant to 49 U.S.C. § 60117(1) and 49 C.F.R. § 190.239, Respondent must take the following remedial requirements with respect to the Affected Segment:

1. Review of Isolated Segment. Respondent must review and inspect the Isolated Segment for conditions similar to those of the Failure including a review of construction, operating and maintenance (O&M), and integrity management records such as in-line inspection (ILI) results, hydrostatic tests, root cause failure analysis of the Failure, aerial and ground patrols, cathodic protection, excavations and pipe replacements. Respondent must address any findings that require remedial measures to be implemented within 30 days of discovery.

   Respondent has completed aerial and ground patrols of the Isolated Segment,[5] however it must still conclude its review of construction, O&M and integrity management records, such as ILI results, hydrostatic tests, root cause failure analysis of the Failure, cathodic protection, excavations and pipe replacement records in order to satisfy this Corrective

[5] Response, at 1.

Action Item.

2. Enhanced Surveillance and Monitoring. Respondent must provide for enhanced patrolling and surveillance of the Isolated Segment until completion of the Root Cause Failure Analysis required in Corrective Action 10.

   Respondent completed enhanced surveillance and patrolling of the Isolated Segment during the purge, load and restart of the pipeline. Its Response acknowledged that additional surveillance, patrolling and monitoring will be included during the completion of its actions in response to additional items.[6] I have therefore modified this Corrective Action Item to require that enhanced patrolling and surveillance of the Isolated Segment continue until the completion of the Root Cause Failure Analysis required in Corrective Action 10.

3. Installation of Strain Gauges. Respondent installed a total of 11 sets of strain gauges. These strain gauges included those required as a part of its Repair Plan, and additional sets determined to be needed after identification of an additional location with the potential for land movement. Accordingly, Respondent has completed the requirements of Corrective Action 3.

4. Hydrostatic Testing. Respondent completed a 49 C.F.R. Part 192 Subpart J pressure test of all replacement pipe utilized at the failure site within the Isolated Segment, in accordance with the Hydrostatic Testing Plan it provided to PHMSA on June 28, 2018. Accordingly, Respondent has completed the requirements of Corrective Action 4.

5. Weather Contingency Plan. Within 30 days of receipt of this Safety Order, Respondent must submit to the Director a contingency plan to operate and monitor the Isolated Segment during saturated soil or flooding conditions, including enhanced patrolling and surveillance.

6. Instrumented Leakage Survey. Within 30 days of receipt of this Safety Order, Respondent must perform an aerial or ground instrumented leakage survey of the Affected Segment. Respondent must investigate all leak indications and remedy all leaks discovered. Respondent must submit documentation of this survey to the Director within 45 days of receipt of this Safety Order.

   Respondent completed instrumented leakage surveys of the Isolated Segment between July 13 and 15, 2018, following the purge and load steps during the restart of the pipeline.[7] However, Respondent has not submitted documentation of an aerial or ground instrumented leakage survey for the entire Affected Segment as required.

7. Records Verification. Respondent must verify the records for the Affected Segment to confirm the maximum operating pressure or MAOP (*See* PHMSA Advisory Bulletin

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[6] Response, at 1.

[7] Response, at 2.

ADB 12-06). Respondent must submit documentation of this record verification within 45 days of receipt of this Safety Order.

8. Review of Prior Inline Inspection (ILI) Results. Within 30 days of receipt of this Safety Order, Respondent must conduct a review of any previous ILI results of the Affected Segment. Respondent must re-evaluate all ILI results, including a review of the ILI vendors' raw data and analysis. Respondent must determine whether any features were present in the failed pipe joint and any other pipe removed. Also, Respondent must determine if any features with similar characteristics are present elsewhere on the Affected Segment. Respondent must submit documentation of this ILI review to the Director within 45 days of receipt of this Safety Order as follows:
   A. List all ILI tool runs, tool types, and the calendar years of the tool runs.
   B. List, describe (type, size, wall loss, etc.), and identify the specific location of all ILI features present in the failed joint and/or other pipe removed.
   C. List, describe (type, size, wall loss, etc.), and identify the specific location of all ILI features with similar characteristics present elsewhere on the Affected Segment.
   D. Explain the process used to review the ILI results and the results of the reevaluation.

9. Mechanical and Metallurgical Testing. Respondent developed a Work Plan and testing protocol, assessment schedule, and commenced mechanical and metallurgical testing of the failed segments by a third-party (Blade Energy Partners), as outlined in the Notice, Corrective Action 9. Metallurgical testing of the failed segments commenced on July 30, 2018. To clarify, the testing protocol defines the requirement for five-day advanced notice and that all testing reports are distributed simultaneously to OPS and Respondent. In addition, daily progress reports and schedules of events from Blade Energy Partners were disseminated to OPS. The final Failure Analysis Report prepared by Blade Energy Partners, dated February 14, 2019, was submitted to OPS on February 22, 2019. Accordingly, Respondent has completed the requirements of Corrective Action 9.

10. Root Cause Failure Analysis. Within 90 days following receipt of this Safety Order, Respondent must complete a root cause failure analysis (RCFA) and submit a final report of this RCFA to the Director. The RCFA must be supplemented and facilitated by an independent third-party with prior written approval of the Director, and must document the decision-making process used in the analysis and all factors contributing to the Failure. The final report must include findings, any lessons learned, and whether the findings and any lessons learned are applicable to other locations within Respondent's pipeline system.

11. Remedial Work Plan. On June 13, 2018, Respondent prepared an Integrity Verification & Remedial Work Plan detailing the actions that it will, or already has, take to ensure the continued integrity of the LEX pipeline. Geotechnical evaluations have been completed along the entire LEX right-of-way and areas of concern identified. Measures to mitigate, monitor and/or repair areas of identified land movement are underway. There are currently no known conditions that would significantly impact the integrity of the pipeline. Accordingly, Respondent has completed the requirements of Corrective Action 11.

12. Monthly Reports. Respondent must submit monthly reports to the Director that: (1) include analysis of all available data and results of the testing and evaluations required by this Safety Order; (2) describe the progress of repairs and other remedial actions being undertaken; and (3) document all mandated actions and management of change plans to ensure that all procedural modifications are incorporated into Respondent's operations and maintenance procedures manual. The first report will be due 30 days from issuance of this Safety Order.

13. Safety Order Documentation Report (SODR). When Respondent has completed all the corrective action items in this Safety Order, it must submit a final SODR in its entirety to the Director. This will allow the Director to conduct a thorough review of all actions taken by Respondent with regards to this Safety Order prior to approving the closure of this Safety Order. The intent is for the SODR to summarize all activities and documentation associated with this Safety Order in one document.
    A. The Director may approve the SODR incrementally without approving the entire SODR.
    B. Once approved by the Director, the SODR will be incorporated by reference into this Safety Order.
    C. The SODR must include, but is not limited to:
        i. Table of Contents;
        ii. Summary of the Failure, and the response activities;
        iii. Summary of pipe data/properties and all prior assessments of the Affected Segment;
        iv. Summary of all tests, inspections, assessments, evaluations, and analysis required by this Safety Order;
        v. Summary of the Mechanical and Metallurgical Testing as required by this Safety Order;
        vi. Summary of the RCFA with all root causes as required by this Safety Order;
        vii. Documentation of all actions taken by Respondent to implement the RWP, the results of those actions, and the inspection and repair criteria used;
        viii. Documentation of any revisions to the RWP including those necessary to incorporate the results of actions undertaken pursuant to this Safety Order and whenever necessary to incorporate new information obtained during the failure investigation and remedial activities;
        ix. Lessons learned while completing this Safety Order;
        x. A path forward describing specific actions Respondent will take on its entire pipeline system as a result of the lessons learned from work on this Safety Order; and
        xi. Appendices (if required).

With respect to each submission under this Safety Order that requires the approval of the Director, the Director may: (a) approve, in whole or part, the submission; (b) approve the submission on specified conditions; (c) modify the submission to cure any deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondent modify the submission; or (e) any combination of the above. In the event of approval, approval upon conditions, or modification by the Director, Respondent shall take all required actions in the

submission as approved or modified by the Director. If the Director disapproves all or any portion of the submission, Respondent shall correct all deficiencies within the time specified by the Director, and resubmit it for approval. If a resubmitted item is disapproved in whole or in part, the Director may again require Respondent to correct the deficiencies in accordance with the foregoing procedure, and the Director may otherwise proceed to enforce the terms of this Safety Order.

It is requested (not mandated) that Respondent maintain documentation of the safety improvement costs associated with fulfilling this Safety Order and submit the total to the Director. It is requested that these costs be reported in two categories: (1) total cost associated with preparation/revision of plans, procedures, studies and analyses; and (2) total cost associated with replacements, additions and other changes to pipeline infrastructure.

The Director may grant an extension of time for compliance with any of the terms of this Safety Order upon a written request timely submitted demonstrating good cause for an extension. Respondent may appeal any decision of the Director to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.

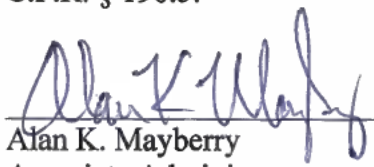
In your correspondence on this matter, please refer to CPF No. 1-2018-1016S and for each document you submit, please provide a copy in electronic format whenever possible.

Be advised that all material you submit in response to this enforcement action is subject to being made publicly available. If you believe that any portion of your responsive material qualifies for confidential treatment under 5 U.S.C. § 552(b), along with the complete original document you must provide a second copy of the document with the portions you believe qualify for confidential treatment redacted and an explanation of why you believe the redacted information qualifies for confidential treatment under 5 U.S.C. § 552(b).

The actions taken pursuant to this Safety Order are in addition to and do not waive any requirements that apply to Respondent's pipeline system under 49 C.F.R. Parts 190 through 199, under any other order issued to Respondent under authority of 49 U.S.C. Chapter 601, or under any other provision of Federal or state law.

After receiving and analyzing additional data in the course of this proceeding and implementation of the required tests and analysis, PHMSA may identify other safety measures that need to be taken. In that event, Respondent will be notified of any proposed additional measures and, if necessary, amendments to the Safety Order.

The terms and conditions of this Safety Order are effective upon service in accordance with 49 C.F.R. § 190.5.



Alan K. Mayberry
Associate Administrator
for Pipeline Safety

OCT 10 2019

Date Issued