



U.S. Department
of Transportation

Pipeline and Hazardous Materials
Safety Administration

901 Locust Street, Suite 462
Kansas City, Missouri 64106-2641

**NOTICE OF PROBABLE VIOLATION
PROPOSED CIVIL PENALTY
and
PROPOSED COMPLIANCE ORDER**

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

November 20, 2015

Mr. Vern Meier
President
TransCanada (TC) Oil Pipeline Operations, Inc.
717 Texas Avenue
Houston, Texas 77002-2761

CPF 3-2015-5010

Dear Mr. Meier:

On multiple occasions between April 2 and November 15, 2012, representatives of the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), pursuant to Chapter 601 of 49 United States Code inspected TransCanada Oil Pipeline Operations Inc.'s (TransCanada's) Keystone Pipeline throughout the central United States. Physical facilities and records were inspected on the mainline from the Canadian Border to Patoka, Illinois and the Cushing Extension.

Background

TransCanada's Keystone Pipeline (Keystone) is a hazardous liquid pipeline transporting crude oil from Canada to facilities in the central United States comprised of the following two lines:

- A 1,025-mile, 30-inch diameter, Mainline from the Canadian border at Cavalier County,

North Dakota, traversing the states of North Dakota, South Dakota, Nebraska, Kansas and Missouri, to Wood River and Patoka, Illinois; and

- A 291-mile, 36-inch diameter, Cushing Extension from Steele City (Jefferson County), Nebraska through Kansas, to Cushing (Marion County), Oklahoma.

TransCanada completed construction of the Keystone mainline segment from the Canadian border to Steele City, Nebraska in 2008 followed by construction of the mainline segment from Steele City, Nebraska to Wood River and Patoka, Illinois in 2009-2010, all of which were then placed in service by June 30, 2010. The Cushing Extension from Steele City, Nebraska to Cushing, Oklahoma was placed in service by February 8, 2011. In October 2012, Keystone reported to PHMSA four significant metal loss anomalies from an in-line inspection (ILI) requiring immediate pressure reduction and verification digs in the Salisbury, Missouri to Patoka, Illinois segment (MP 868 to 1083). The digs validated that stray current D.C. interference from foreign pipelines near MP 995 had caused four metal loss features over sixty percent deep (97%, 69%, 74%, 61%). The 97% deep anomaly left a remaining wall thickness of 0.0120 inch, which is less than 1/64 inch. Keystone conducted a close interval survey in December 2011 which had identified cathodic protection potentials that were below criteria, along with the existence of interference from other pipeline operators in the vicinity. A report, *Corrosion Anomaly at MP 995 KS9 Salisbury to Patoka on Keystone Pipeline* (Report), issued on November 21, 2012, identified the primary cause of the pitting mechanism as the inadequacy of the original CP design. The secondary cause identified was the timeliness of corrective actions that could have been accelerated to mitigate the corrosion.

As a result of the inspection, it appears that TransCanada has committed probable violations of the Pipeline Safety Regulations, Title 49, Code of Federal Regulations. The items inspected and the probable violations are:

1. §195.401 General requirements.

- (a) No operator may operate or maintain its pipeline systems at a level of safety lower than that required by this subpart and the procedures it is required to establish under §195.402(a) of this subpart.**

TransCanada did not operate the Steele City to Patoka and Cushing Extension at a level of safety as required by Subpart F and the procedures required by §195.402(a). Part 195.402(a) requires each operator to prepare and follow procedures for normal operations and maintenance activities which are further described in §195.402(c)(3) to include "operating, maintaining, and repairing the pipeline system in accordance with each of the requirements of this subpart and subpart H of this part." Subpart H – Corrosion Control includes Part 195.563(a) which requires each pipeline to have cathodic protection (CP) in operation no later than 1 year after the pipeline is constructed.

The mainline segment from Steele City, Nebraska to Patoka, Illinois was placed in service by June 30, 2010. Corrective measures to complete the installation of the CP did not occur until November 2012 and then again in 2013. According to the criteria in TransCanada's

procedures and Part 195.563(a), adequate CP should have been in operation on the pipeline by June 30, 2011.

Upon investigation, the CP system was not designed properly as stated in TransCanada's *Corrosion Anomaly at MP 995 KS9 Salisbury to Patoka on Keystone Pipeline Report* (Report), and did not meet its procedure TED-CP-DD *Cathodic Protection Design Directive* regarding sufficient current supplied to the pipeline as described in Section 9 "Current Required for Protection." The summary of the Report found (in part):

"The anomalies in the MP995 Anomaly Area were unprecedented.....(they) are believed to be a direct result of low cathodic protection levels caused by an inadequate cathodic protection design which did not fully consider all of the bare metallic structures including substation grounding grids in the pump stations."

In discussions with TransCanada's personnel in November 2012 and as documented in the CP reports, TransCanada determined that design changes made to the pump stations early in the project were not communicated to the personnel designing the CP system. The design changes in the pump stations created an increased demand for CP current, which was not adequately incorporated into the final design of the CP system. In addition, the initial CP design only called for ground beds at the pump stations on the mainline between Steele City, Nebraska and Patoka, Illinois. The CP system on the mainline from the Canadian border to Steele City, on the other hand, had ground beds at both the pump stations and midway between the pump stations.

TransCanada's initial CP survey of the Steele City to Patoka mainline completed in December 2010 and the Cushing Extension segments completed in August 2011 showed low CP in numerous locations. As a result, TransCanada installed 12 new ground bed systems on the mainline between Steele City and Patoka and an additional 4 ground beds installed on the Cushing Extension in 2012. An additional 5 ground beds were installed on the Steele City to Patoka segment of the mainline in 2013, primarily at the eastern end of the mainline just west of St. Louis. An additional two ground beds were installed on the Cushing Extension in 2013.

TransCanada operated its cathodic protection system on the Keystone Pipeline at a level of safety below that required by Subpart F; therefore specifically violating §195.401(a).

2. §195.573 What must I do to monitor external corrosion control?

(a) Protected pipelines. You must do the following to determine whether cathodic protection required by this subpart complies with Sec. 195.571:

(1) Conduct tests on the protected pipeline at least once each calendar year, but with intervals not exceeding 15 months. However, if tests at those intervals are

impractical for separately protected short sections of bare or ineffectively coated pipelines, testing may be done at least once every 3 calendar years, but with intervals not exceeding 39 months.

TransCanada failed to conduct tests to monitor the protected pipeline at least once each calendar year, but with intervals not exceeding 15 months. According to TransCanada's records, fifty-one (51) required annual cathodic protection test stations readings were not taken from 2010 to 2012 on the East Leg of Keystone from Steel City, Nebraska to Patoka, Illinois. Twenty-three (23) were from Steele City to Salisbury and the other twenty-eight 28 were from Salisbury to Patoka. TransCanada provided no rational for the failure to conduct and record the required testing.

3. §195.573 What must I do to monitor external corrosion control?

(e) Corrective action. You must correct any identified deficiency in corrosion control as required by Sec. 195.401(b).

TransCanada failed to correct cathodic protection deficiencies found in 62 locations within a reasonable time. TransCanada's records indicate deficiencies that remained uncorrected for multiple years.

On the TransCanada Keystone Pipeline from Steel City, Nebraska to Patoka, Illinois compiled records from 2010 to 2012 documented the following 56 deficiencies:

- 44 multiple-year cathodic protection test station deficient (low) readings with 5 still not remediated by March 2013;
- 3 test stations at 1 pump station not remediated by March 2013; and
- 9 multiple-year cathodic protection deficient (low) readings at 5 valve sites.

In addition, on the TransCanada Keystone Cushing Extension from Steele City, Nebraska to Cushing, Oklahoma records from 2010 to 2012 documented the following 6 deficiencies:

- 3 mainline multiple-year cathodic protection test station deficient readings; and
- 3 multiple-years of cathodic protection deficient readings at 1 pump station.

4. §195.577 What must I do to alleviate interference currents?

(a) For pipelines exposed to stray currents, you must have a program to identify, test for, and minimize the detrimental effects of such currents.

TransCanada failed to minimize the detrimental effect of interference currents on at least two areas under the influence of another pipeline CP system in a timely manner. Records document that at MPs 991 to 998 on the mainline near St. Louis and MP 137 on the Cushing Extension, stray currents existed on the pipeline over a year after installing corrosion control

measures meant to alleviate the problem. TransCanada reported to PHMSA on March 27, 2012, in the Special Permit Condition #37 Response, the existence of interference locations and mitigation efforts taken to address those problems. Phase 1 refers to the pipeline from the Canadian/US border to Illinois and Phase 2 refers to the Cushing Extension.

The response stated in part:

- “Phase 1
 - A review of the 2010 annual survey data indicates potential DC interference conditions existed at thirty (30) locations. Prior to the 2011 annual survey, remedial action had been completed at all thirty (30) potential interference sites. A review of 2011 annual survey data indicates the potential for DC interference exists at five (5) locations of which four (4) are from the initial sites identified in 2010; one new (1) location has been identified in 2011. Site testing has been planned at these 5 sites in Q2 2012.”
- “Phase 2
 - A review of the 2011 survey data indicates potential DC interference condition existed at two (2) locations.
 - Both sites identified as having potential interference issues have had remedial facilities installed.”

TransCanada’s own contractor finding from its National Pipeline Service report dated October 23, 2013 stated:

“The existing cathodic protection systems at St. Paul and Hartford Pump Stations were installed and energized in June of 2010, approximately 9 months after installation of the pipeline. The temporary bonds were then installed approximately one year later in August of 2011, after baseline annual test point surveys indicated inadequate potentials and then ensuing investigation determined the strong possibility for stray current interference from neighboring pipelines.”

Severe interference corrosion anomalies were identified in October 2012 near St. Louis MP 998. On November 14, 2012, TransCanada’s Close Interval Survey dated November 14, 2012, showed interference current still on the pipeline from MP 991 to 998 which was 28 months after the pipeline was placed in service. Keystone had knowledge of the foreign pipelines in these locations as this was a common pipeline corridor as shown in alignment sheets.

TransCanada also continued to remediate interference on the Cushing Extension near MP 137 through 2012 which involved another operator’s facility that had been in place over 50 years. TransCanada did not correct the interference until November 2, 2012, almost 21 months after deliveries began on February 8, 2011. Problems continued to persist requiring one rectifier to be installed at MP 136.62 in May 2013. TransCanada continued to identify anomalies from

low cathodic protection levels as documented in its *Letter to PHMSA December 9, 2013 – KS 10 Proposed Excavation*. The letter stated:

“In accordance with special condition 42, TransCanada hereby informs PHMSA of a proposed correlation excavation on the Cushing Extension of Keystone on or around Dec 20th, 2013. Specifically, the excavation is on the KS10 section in Kansas near the Burns receipt barrel. Although the metal loss anomaly is not in a HCA (or in a could affect segment), nor does it meet any prescribed response criteria, with a reported depth of 67%WT the feature has been flagged for correlation in support of the final report for the ILI. This feature is in an area of initially low CP potentials that were subsequently remediated with the addition of new anode beds. The dig sheet for the proposed excavation is attached.”

The dig sheet called pits with depths of 34.1 to 66.9 percent through wall which were later validated in TransCanada’s “Summary of Initial Correlation Excavation on KS10” report to be 32 to 34 percent through wall.

The multiple anomalies found on TransCanada’s Keystone segments near St. Louis, Missouri and on the Cushing Extension near Burns, Kansas were the result of not correcting the effects of interference corrosion in a timely manner as required by §195.577.

Proposed Civil Penalty

Under 49 United States Code, § 60122, you are subject to a civil penalty not to exceed \$200,000 per violation per day the violation persists up to a maximum of \$2,000,000 for a related series of violations. For violations occurring prior to January 4, 2012, the maximum penalty may not exceed \$100,000 per violation per day, with a maximum penalty not to exceed \$1,000,000 for a related series of violations. The Compliance Officer has reviewed the circumstances and supporting documentation involved in the above probable violation(s) and has recommended that you be preliminarily assessed a civil penalty of \$187,200 as follows:

<u>Item number</u>	<u>PENALTY</u>
1	\$53,800
2	\$51,800
3	\$53,200
4	\$28,400

Proposed Compliance Order

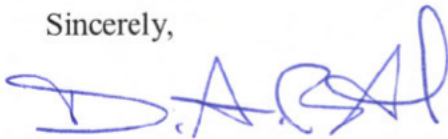
With respect to item(s) 1, 3, and 4 pursuant to 49 United States Code § 60118, the Pipeline and Hazardous Materials Safety Administration proposes to issue a Compliance Order to TransCanada. Please refer to the *Proposed Compliance Order*, which is enclosed and made a part of this Notice.

Response to this Notice

Enclosed as part of this Notice is a document entitled *Response Options for Pipeline Operators in Compliance Proceedings*. Please refer to this document and note the response options. All material you submit in response to this enforcement action may be 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). If you do not respond within 30 days of receipt of this Notice, this constitutes a waiver of your right to contest the allegations in this Notice and authorizes the Associate Administrator for Pipeline Safety to find facts as alleged in this Notice without further notice to you and to issue a Final Order.

In your correspondence on this matter, please refer to **CPF 3-2015-5010** and for each document you submit, please provide a copy in electronic format whenever possible.

Sincerely,



 Allan C. Beshore
Director, Central Region, OPS
Pipeline and Hazardous Materials Safety Administration

Enclosures: *Proposed Compliance Order*
Response Options for Pipeline Operators in Compliance Proceedings

PROPOSED COMPLIANCE ORDER

Pursuant to 49 United States Code § 60118, the Pipeline and Hazardous Materials Safety Administration (PHMSA) proposes to issue to TransCanada (TC) Oil Pipeline Operations, Inc. a Compliance Order incorporating the following remedial requirements to ensure the compliance of TransCanada Oil Pipeline Operations, Inc. with the pipeline safety regulations:

1. In regard to Items Number 1 and 4 of the Notice pertaining to an inadequate cathodic protection system, TC Keystone must provide records of facilities installed and close interval surveys taken on the Keystone Pipeline confirming that the pipeline is adequately protected on the East Leg segment from Steele City, Nebraska to Patoka, Illinois and interference currents have been alleviated.
2. In regard to Item Number 3 of the Notice pertaining to deficiencies in corrosion control, TC Keystone must correct the remaining deficiencies listed in Item 3 of the NOPV and record the cathodic protection pipe-to-soil potentials.
3. TC Keystone must provide the records in Item 1 and 2 of the proposed compliance order within six (6) months of the date of the Final Order.
4. It is requested (not mandated) that TransCanada (TC) Oil Pipeline Operations Inc. maintain documentation of the safety improvement costs associated with fulfilling this Compliance Order and submit the total to Allan Beshore, Director, Central Region, Pipeline and Hazardous Materials Safety Administration. 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.