



U.S. Department
of Transportation

Research and
Special Programs
Administration

400 Seventh St., S.W.
Washington, D.C. 20590

MAR 17 2003

VIA CERTIFIED MAIL (RETURN RECEIPT REQUESTED)

Mr. Bill White
Vice President of Operations & Engineering
Kinder Morgan Energy Partners, L.P.
1100 Town & Country Road
Orange, California 92868

Re: CPF No. 4-2001-5010-H

Dear Mr. White:

Enclosed is an Amendment to Corrective Action Order. The Corrective Action Order that was issued on March 14, 2001, placed a pressure restriction on the two line segments that comprise Kinder Morgan's Phoenix-Tucson-Davis Monthan AFB petroleum products pipeline. The March 14 Order also proposed an amendment to require additional measures.

This Amendment requires Kinder Morgan to maintain the current reduced operating pressure on its Phoenix-Tucson-Davis Monthan AFB line, and to proceed forward with Item 5 as proposed in the March 14 Order. This Amendment withdraws Items 3, 4, and 6 that were proposed in the March 14 Order.

Service is being made by certified mail. Your receipt of the enclosed document constitutes service of that document. The terms and conditions of this Amendment to Corrective Action Order are effective upon receipt.

Sincerely,

Gwendolyn M. Hill
Pipeline Compliance Registry
Office of Pipeline Safety

Enclosure

cc: Andrew M. Taylor, Esq.
Bracewell & Patterson, LLP

Van P. Williams, Esq.
Kinder Morgan Energy Partners, LP

Mr. Edward A. "Buzz" Fant
Kinder Morgan Energy Partners, LP

U.S. DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
OFFICE OF PIPELINE SAFETY
WASHINGTON, DC 20590

In the Matter of)
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Kinder Morgan Energy Partners, L.P.,)
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Respondent.)
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CPF No. 4-2001-5010-H

AMENDMENT TO CORRECTIVE ACTION ORDER

Purpose and Background

On March 14, 2001, the Associate Administrator for Pipeline Safety issued a 'Corrective Action Order and Notice Proposing to Amend the Order Following Opportunity for a Hearing' (March 14 Order) finding that continued operation by Kinder Morgan Energy Partners, L.P. ('Respondent' or 'Kinder Morgan') of its Phoenix-Tucson-Davis Monthan AFB line would be hazardous to the public and the environment without implementation of corrective measures. Accordingly, the March 14 Order required that the pipeline be operated at a reduced pressure. (The March 14 Order referred to this parallel line segment as the Phoenix-Tucson line. As noted below, the two pipelines actually run from Phoenix to Tucson to Davis Monthan AFB. The pipelines will be referred to as line segments 53 and 54, or LS 53/54, in this document.) The Notice portion of the March 14 Order proposed requiring Respondent to develop and implement a work plan and schedule for performing coating evaluations on the line, and for repairing or replacing sections that were determined to require remedial measures (Items 3 and 4). The Notice portion also proposed requiring Respondent to develop a work plan and schedule for conducting a second internal inspection on LS 53/54, and for conducting internal inspections on other lines operating in Arizona, New Mexico, and Texas (Items 5 and 6).

Following issuance of the March 14 Order, Respondent requested an informal hearing, which took place in Houston, Texas on August 14, 2001. Respondent contested the terms of the March 14 Order, and also contested the proposed amendments to the March 14 Order. Respondent addressed the allegations in an August 9, 2001 letter, and in a follow-up letter dated August 14, 2001. After the hearing, Respondent provided additional information in correspondence dated August 27, 2001 and September 28, 2001. The September 28, 2001 correspondence was submitted in response to a written request by the presiding official of the hearing for additional information.

Addition and Correction of Information

The preliminary findings supporting the finding of hazardous facility are supplemented with the following information provided by Respondent in its correspondence dated August 14, 2001. Respondent submitted this correspondence to correct certain information that it asserted was erroneous.

Preliminary finding 1 indicated that Respondent operates parallel 6-inch pipelines from Phoenix to Tucson. In fact, the pipelines run from Phoenix to Tucson to Davis Monthan Air Force Base within the city of Tucson.

Preliminary finding 7 indicated that Respondent had made repairs to at least 60 locations along the Phoenix-Tucson line. Respondent actually performed repairs at 52 locations.

Preliminary finding 9 indicated that the Phoenix-Tucson line contains two segments with upgraded pipe, measuring 16.9 and 11.3 miles, respectively. This information was incorrect.

Preliminary finding 10 indicated that the average spacing between rectifiers is 3.5 miles. The average spacing is actually 3.9 miles.

Preliminary finding 13 indicated that Respondent's corrosion engineers and technicians attributed the extensive corrosion on its 8-inch El Paso-Tucson-Phoenix and 12-inch El Paso-Tucson lines to the poor condition of the coating on the pipelines. Respondent has taken the position that at no time did Santa Fe (the previous operator of the pipeline) ever attribute corrosion on the line to poor coating. Due to a lack of evidence, the preceding assertion will not be incorporated into the factual record.

Preliminary finding 14 indicated that the Director, Southwest Region wrote letters on August 15 and October 17, 1997 asking Respondent to submit plans for re-coating its 8-inch El Paso-Tucson-Phoenix line and for conducting internal inspections on its 12-inch El Paso-Tucson line. The item indicated that Respondent did not provide plans. Respondent alleged in its response that representatives of Kinder Morgan met with former Southwest Region Director Jim Thomas and two other OPS employees and were told verbally by Mr. Thomas that "he felt that the presentation and discussion satisfied the DOT request for information." (August 9, 2001 Response, p. 10). This information cannot be substantiated, and therefore is not incorporated into the factual record.

Respondent offered several other factual corrections which are noted as accurate. The remaining statements provided in Respondent's August 14, 2001 correspondence consisted of opinions that were the subject of debate between Respondent and OPS. These issues are addressed later in this decision.

After modification of the preliminary facts described above, I continue to find that the operation of this pipeline without corrective measures would be hazardous to life, property, and the environment.

Discussion

The total mileage for Respondent's 6" pipeline segment 53/54 is 137.8 miles. The line was first placed into service in 1956, and has experienced six leaks, all corrosion-related, according to Respondent. The first leak occurred in August of 1958, approximately two years after operations began. (Report of Kevin C. Garrity, p. 4). Cathodic protection rectifiers were first installed on the system in December 1957. (Report of Kiefner and Associates, Inc., p. 1). The most recent leak occurred in 1988. (Report of Kevin C. Garrity, p. 4).

Operating Pressure, Corrosion, and Coating

Item 1 under 'Required Corrective Action' in the March 14 Order directed Respondent to "maintain an operating pressure on the line that is equal to or less than 80% of the MOP." Respondent contested this item, arguing that it has "carefully repaired all significant anomalies so that the pipeline can withstand the original MOP pressure of 2000 psig." (August 14 Response, p. 10). In addition, Respondent contended that it has violated no DOT regulations.

More specifically, Respondent asserted that it is not violating any DOT regulations that address either cathodic protection or coating protection. (August 14 Response, p. 2).

Items 3 and 4 under the 'Proposed Amendment' section of the March 14 Order proposed requiring Respondent to "develop and implement a work plan for performing coating evaluations" and a schedule "for re-coating, repairing or replacing sections of the line that are determined by the coating evaluation to require remedial measures."

In its August 14 Response, Kinder Morgan asserted that a coating evaluation is not necessary because OPS has not demonstrated that active corrosion exists or that the cathodic protection in place on the system is inadequate. Respondent's corrosion control manager Brad Lewis testified that Kinder Morgan conducted tests at 59 areas, and found no signs of active corrosion. Both Respondent and its third-party corrosion expert Kevin C. Garrity testified that they believe all corrosion took place on the line in the first two years that the line was in operation, before cathodic protection was installed on the system. In an inter-office memo dated August 24, 2000, Mr. Lewis wrote at page 1: "Due to the number and early development of leaks on the line, it is reasonable to assume there was a significant amount of corrosion on this pipe dating back to the original construction."

Mr. Garrity, at p. 9 in his report, wrote: "The exact cause of the corrosion on the LS53/54 piping is indeterminate and likely occurred shortly after construction and prior to establishing effective cathodic protection."

While OPS did not dispute Respondent's finding of no active corrosion, OPS representatives testified that they believe the tests only demonstrate that active corrosion was not present on the day that each test was conducted. In other words, OPS asserted that the tests indicate conditions on the pipe only at the time that the test is taken, while active corrosion may have been present before or after the testing. Respondent did not refute the OPS position that the tests only indicate conditions

at the time each test sample is taken. Rather, Respondent continues to rely on its assertion that most corrosion-related damage took place in the two years immediately following construction of the line and that cathodic protection now prevents corrosion.

Respondent has installed a total of 40 rectifiers, which protect the system against corrosion by providing electrical current to the exterior of the pipeline. Mr. Garrity, Respondent's corrosion expert, asserted at the hearing that the amount of current being applied to the pipeline is sufficient to prevent active corrosion from occurring. Mr. Lewis, Respondent's corrosion control manager, testified that Kinder Morgan is applying approximately three times the amount of current required by regulation. Following the August 14, 2001 hearing, both Respondent and the OPS Southwest Regional Director were asked to address the question of whether excessive cathodic protection voltages can lead to coating disbondment and blistering of wall pipe on LS 53/54. Both parties submitted written responses indicating that coating disbondment and blistering of wall pipe should not be a subject of concern for this pipeline.

The pipeline was installed with a coal tar enamel coating. (Report of K. Garrity, p. 9). Mr. Garrity testified that he believes that an older coating system can provide adequate protection, if used in combination with a good cathodic protection system. OPS presented no testimony to directly contradict the assertion that an older coating system, in combination with a good cathodic protection system, could provide adequate protection on the pipeline. Respondent wrote at p. 7 of its August 14, 2001 Response that it replaced 1604 feet of pipe as a result of inspecting the excavated areas following the internal inspection in 1999. In addition, 6.5 miles of the pipeline were re-coated in 1995 (at MP 119.17 to 125.67), and approximately 6.2 miles of pipe in other areas have been replaced as a result of various street widening and pavement projects. (August 27, 2001 Response, pp. 1-2.)

There is not sufficient evidence to show that Respondent's cathodic protection system is ineffective or that active corrosion exists. Therefore, the coating evaluation requirements (Items 3 and 4 in the March 14 Order) are withdrawn. I will not use the authority of 49 U.S.C. § 60112 to require Respondent to apply new coating to its pipeline. This decision does not preclude OPS from raising the issue in a future action if additional information is discovered that would justify such action. Respondent should, however, consider further assessment of the condition of its coating and the need to address the condition. Mr. Garrity testified he believes the pipeline is 50% bare. Coating in this condition makes effective cathodic protection difficult. A coating evaluation and associated repairs would help maintain adequate cathodic protection. A uniform coating would prevent water and/or soil from making direct contact with the pipe steel, thus eliminating the path used for corrosion to occur. A uniform coating would also reduce the amount of current that is now necessary to protect the pipeline from corrosion.

Review of Records

Item 6 in the March 14 Order proposed directing Respondent to submit results of all internal inspections performed on all its lines (other than LS 53/54) operating in Arizona, New Mexico, and Texas. In its response, Respondent wrote that the factual findings of this case did not warrant this

action, and that these reports were nonetheless available for OPS' inspection in the course of visits to Respondent's various facilities. (August 14, 2001 Response, p. 13.) At the hearing, OPS did not object to Respondent's position and agreed that it will inspect these records during future on-site inspections.

Standard for Corrective Action

One of Respondent's main arguments is that OPS has not alleged any violation of the OPS regulations. No violation must be alleged, however, in order for a facility to be declared hazardous. The procedural regulation on corrective action orders (49 C.F.R. § 190.233) does not provide for OPS to address violations in this proceeding. Violations are generally addressed in proceedings where a civil penalties or compliance order is imposed. Furthermore, section 60112 of Title 49 of the U.S. Code does not require the agency to find violations of regulations in order to find a situation hazardous. In this case, Respondent has reported that the wall thickness in certain areas on its pipeline system has been reduced. According to OPS, this condition makes operation of the subject pipeline segment unsafe at full pressure.

Respondent asserts that it has addressed all areas where decreased wall thickness jeopardized the safety of its pipeline system. In order to assess the condition and thickness of the pipeline walls, Respondent ran an internal inspection tool, known as a high resolution magnetic flux leakage tool, on LS 53/54 in 1999. Internal inspection provides evidence of corrosion control effectiveness, mostly by detecting areas of corrosion after inadequate cathodic protection has resulted in metal loss.

Under normal circumstances, one internal inspection would provide satisfactory assurance that the line was safe. In this instance, however, the facts make it clear that closer scrutiny of the line is necessary. The results of internal inspection reveal a total 5504 anomalies on the line. While the results indicated that the vast majority of these anomalies reflected a wall loss of 10 - 29%, many other anomalies were detected to have greater wall loss. A total of 167 areas were detected as having a wall loss between 50 and 69%, and two areas were detected as having wall loss equal to or greater than 70%.

Respondent established inspection criteria to dig up all areas where the test indicated wall loss of 60% or more. Respondent's expert John Kiefner stated at the hearing that the industry standard is to inspect all areas that indicate a wall loss of 80% or more, and that Respondent's criteria of inspecting all areas of 60% or greater provides an adequate margin of safety.

According to Kiefner, the normal margin of error on internal inspection tools (Kiefner refers to this as 'vendor tolerance') is $\pm 10\%$, which would establish an 80% confidence interval. In other words, 80% of all measurements taken should fall within the $\pm 10\%$ margin. In order to obtain a 95% confidence interval, the tool tolerance was converted to a margin of $\pm 15\%$, meaning 95% of the measurements taken would fall with the $\pm 15\%$ margin. (Report of Kiefner and Associates, Inc., p. 3). OPS did not question the assertion that the test results reflect a 95% accuracy. OPS, through the testimony of its interstate agent in Arizona, did raise concerns regarding the remaining 5% (or less)

of measurements recorded by the internal inspection tool. To verify the accuracy of its assertion that 95% of the measurements were accurate within a margin of $\pm 15\%$, Respondent measured wall thickness at 55 points.¹

Although only one out of 55 points measured exceeded the estimated pit depth by greater than 15%, in the case where the measurement differed from the actual wall loss, the difference in wall loss amounted to 30%. In that instance, the reading indicated a wall loss of 30%, while the actual wall loss as recorded when the line was excavated measured 60%. This represents a significant deviation from the inspection result and raises cause for concern. Concern is warranted because even though Respondent chose to take measurements for all areas where readings indicated a wall loss of 60% or more, it is possible that an area indicating a wall loss of 50 - 59% could actually represent a wall loss of 80 - 89%. Even though a second inaccurate reading of similar proportion may not be likely, the possibility clearly exists.

In certain cases, the risk of a small number of inaccurate internal inspection readings may be acceptable. For instance, if the line in question was known to be in generally good condition with good coating and few or no signs of corrosion. Proximity to sensitive areas would also factor into whether additional internal inspections runs would be necessary. In this case a combination of factors makes a second internal inspection necessary in order to provide an adequate margin of safety. By all accounts, this pipeline is not in average or above-average physical condition. As stated above, more than 5500 anomalies were detected and only 50% of the pipeline is protected by coating. (Testimony of Garrity.) The amount of electrical current being applied to the pipeline is approximately three times above the amount required. (Testimony of Brad Lewis.) As noted in the March 14 Order, LS 53/54 intersects a railroad line, a state highway, the Gila River and two Indian reservations. The line also passes within 0.30 miles of a school and within 0.30 miles to 15 miles of scattered areas of population.

If just one area containing corrosion above the acceptable safety margin exists, the line is unsafe. The possibility of inaccurate readings similar to the one described above presents an unacceptable risk given the totality of the circumstances described above. Based on the information currently available, and without a second internal inspection, it would not be prudent to declare this pipeline safe for operation at full pressure at this time. The running of a second internal inspection will likely result in one of two findings: (1) the first internal inspection was accurate as reflected by consistency of readings between the first and second inspections; or (2) additional discrepancies are identified and further action becomes necessary in order to verify wall thickness.

¹ The 55 points measured appear to have been randomly selected, although no evidence was introduced indicating how the points were chosen. The points appear to have been randomly chosen because the original readings cover an area ranging from less than 20% estimated wall loss to an estimated 75% wall loss.

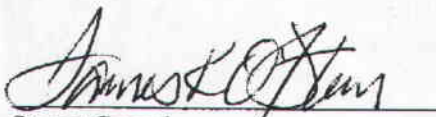
ORDER

Therefore, pursuant to 49 U.S.C. § 60112, I hereby order Respondent to immediately take the following corrective action with respect to segments 53 and 54 of its 6-inch Phoenix-Tucson-Davis Monthan AFB petroleum products pipeline:

1. Develop a work plan and schedule for conducting internal inspection tests using the same or similar technology which identified the extensive metal loss instances referred to in Preliminary Finding 2 of the March 14 Order.
 - (a) Submit the work plan described in this action item to the Director, Southwest Region, for approval within 30 days of receipt of this Amendment.
 - (b) Submit a report on the results and findings of the internal inspection tests to the Director, Southwest Region, within 30 days of completion of the testing.

The terms of the March 14, 2001 Corrective Action Order remain in effect.

Failure to comply with the Corrective Action Order, as amended, may result in the assessment of civil penalties of not more than \$25,000 per day and in referral to the Attorney General for appropriate relief in United States District Court. The terms and conditions of this Amendment are effective upon receipt.



Stacey Gerard

401 Associate Administrator
for Pipeline Safety

MAR 17 2003

Date Issued