

VIA CERTIFIED MAIL (RETURN RECEIPT REQUESTED) AND TELECOPY

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

Re: CPF No. 4-2000-5010-H

Dear Mr. White:

Enclosed is a Corrective Action Order and Notice Proposing to Amend the Order Following Opportunity for a Hearing that has been issued by the Associate Administrator for Pipeline Safety in the above-referenced case. The Order portion of the document places a pressure restriction on two line segments of the Phoenix-Tucson petroleum products pipeline. The Notice portion of the document proposes to amend the Order to address the internal inspection, repair and replacement of sections of the Phoenix-Tucson line, and the internal inspection of other lines operating in Arizona, New Mexico, and Texas.

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

Sincerely,

Gwendolyn M. Hill  
Pipeline Compliance Registry  
Office of Pipeline Safety

Enclosure

DEPARTMENT OF TRANSPORTATION  
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION  
WASHINGTON, DC 20590

In the Matter of  
Kinder Morgan, Inc.,  
Respondent.

CPF No. 4-2000-5010-H

**CORRECTIVE ACTION ORDER AND  
NOTICE PROPOSING TO AMEND THE ORDER  
FOLLOWING OPPORTUNITY FOR HEARING**

**Purpose and Background**

This Corrective Action Order and Notice Proposing to Amend the Order Following Opportunity for Hearing, is being issued under authority of 49 U.S.C. § 60112, to require Kinder Morgan, Inc. (Respondent) to take necessary corrective action to protect the public and the environment from the risks of pipeline failure of its pipeline system in Arizona, New Mexico and Texas. Respondent transports petroleum products throughout this system.

Data collected from recent internal inspections performed by Respondent along a small portion of its pipeline system indicated numerous instances of corrosion and metal loss. Internal inspections performed along other parts of respondent's pipeline system in 1997 revealed similar indications of external corrosion.

**Preliminary Findings**

1. Respondent transports petroleum products using the following pipelines in Arizona, New Mexico and Texas:
  - 6-inch pipeline from Phoenix to Tucson, Arizona (Phoenix-Tucson);
  - 8-inch pipeline from El Paso, Texas to Tucson to Phoenix, Arizona (El Paso-Tucson-Phoenix);
  - 12-inch pipeline from El Paso, Texas to Tucson, Arizona (El Paso-Tucson);
  - 6-inch pipeline from Tucson to Davis Montham Air Force Base, Arizona (Tucson-Davis AFB);

- 8.5-inch pipeline from Tucson to Toltec to Phoenix, Arizona (Tucson-Toltec-Phoenix);
  - 6-inch pipeline from Yuma to Yuma Marine Corp Air Station, Arizona (Yuma-Yuma MCAS);
  - 20-inch pipeline from Yuma to Phoenix, Arizona (Yuma-Phoenix); and
  - 6-inch pipeline from Phoenix to Luke Air Force Base, Arizona (Phoenix-Luke AFB)
2. On November 24, 1999, Respondent performed an internal inspection on a portion of the 6-inch Phoenix-Tucson line. Following the inspection, Respondent analyzed the inspection data and verified a sample of the data by performing non-destructive field tests. On March 2, 2000, the analysis and subsequent field testing led Respondent to discover the presence of general corrosion which had reduced the design safety margin of the pipe to an unsafe level.
  3. At the time the unsafe condition was discovered, the maximum operating pressure (MOP) of the Phoenix-Tucson line was 2000 psig. On March 2, 2000, Respondent voluntarily reduced the operating pressure of the line to 1735 psig (87% of MOP). On April 3, 2000, Respondent further reduced the operating pressure of the line to 1050 psig (52.5% of MOP).
  4. On March 3, 2000, Respondent installed three full encirclement sleeves over the areas of general corrosion discovered on March 2, 2000.
  5. On March 8, 2000, the Office of Pipeline Safety received Safety-Related Condition Report #20000005 from the Respondent. The Report provided information about the unsafe condition discovered by the Respondent on March 2, 2000. The Report also detailed the initial pressure reduction and remedial measures taken by the Respondent.
  6. On April 3 - 5, 2000, an engineer from the Southwestern Region, OPS, conducted an initial inspection for the purpose of gathering information relating to the March 8, 2000 Safety-Related Condition Report. During the course of the OPS investigation, OPS reviewed a Summary Report of the internal inspection data, dated March 24, 2000. This Summary Report noted the following:
    - 2 findings of metal loss to a depth equal to or greater than 70% of the pipe wall thickness;
    - 167 findings of loss to 50-69% of the pipe wall;
    - 676 findings of loss to 30-49% of the pipe wall; and
    - 4,659 findings of loss to 10-29% of the pipe wall.

External corrosion accounted for 87% of the metal loss findings.

7. Since March 3, 2000, Respondent has made repairs to at least 60 locations along the Phoenix-Tucson line in accordance with its Maintenance Manual. Respondent is in the process of making additional repairs to the line.
8. The Phoenix-Tucson line originates and ends in commercial and industrial areas. This pipeline intersects a railroad line, Interstate 10, the Gila River, and two Indian reservations. In addition,

the line passes within 0.30 miles of a school near milepost 70 and within 0.30 miles to 15 miles of scattered areas of population.

9. Segments 53 and 54 of the Phoenix-Tucson line were constructed in 1957 and extend a distance of 94.0 and 43.8 miles respectively. The primary type of pipe used along these segments is 6-inch X-42-ERW pipe with a wall thickness of 0.219 inches, manufactured by Kaiser. However, a portion of segment 54 (approximately 1943 feet) has been changed to 6-inch, Grade B pipe with a wall thickness of 0.280 inches. In addition, a portion of segments 53 and 54 (16.9 and 11.3 miles, respectively) has been upgraded to 6-inch X-42-ERW pipe with a wall thickness of 0.250 inches, manufactured by Kaiser.
10. An OPS analysis of the cathodic protection rectifiers used by Respondent to protect the Phoenix-Tucson line from corrosion found that the average spacing between these rectifiers was approximately 3.5 miles. This spacing is significantly shorter than would be expected for a pipeline with a good protective coating layer in the same environment.
11. An OPS analysis of the current density for the cathodic protection system used by Respondent to protect the Phoenix-Tucson line from corrosion found a density of approximately 1.07 milliamps per square foot. This current density approaches the magnitude of current which would be required to protect pipelines with no coating.
12. The coating on the Phoenix-Tucson line has degraded to the point of becoming a major contributing factor in the development of external corrosion and metal loss.
13. Between July 14 and July 18, 1997, engineers from the Southwest Region, OPS, conducted an on-site inspection of the 8-inch El Paso-Tucson-Phoenix and 12-inch El Paso-Tucson lines, formerly operated by Santa Fe Pacific Pipelines Partners, L.P. (Santa Fe). This inspection included a review of internal inspection test data collected by Respondent, which revealed numerous instances of external corrosion along those lines. Respondent's corrosion engineers and technicians attributed the extensive corrosion to the poor condition of the coating on the pipelines.
14. By letters dated August 15 and October 17, 1997, the Director, Southwest Region, asked Respondent to submit its plans for re-coating the 8-inch El-Paso-Tucson-Phoenix line and for conducting internal inspections on the 12-inch El Paso-Tucson line. Respondent did not provide its plans to OPS.

### **Discussion of Findings**

Pipelines are protected from external corrosion by the application of a coating, supplemented by a cathodic protection system. Coating protects pipe by placing a barrier between the metal pipe and the soil. This separation inhibits corrosion. A cathodic protection system supplements the coating by using

an electrical current to mitigate corrosion on coating 'holidays'. All coatings degrade over time and require greater amounts of cathodic protection to adequately protect the pipeline from external corrosion.

Although the exact cause of the external corrosion found on the Phoenix-Tucson line is not yet known, OPS has determined that a major contributing factor is the poor condition of the coating on the pipeline. OPS based this determination on the age of the pipe, the number of cathodic protection rectifiers installed on the Phoenix-Tucson line, the output of current from these rectifiers, and the density of the protective current applied on the pipeline. In addition, OPS is concerned about the 1997 internal inspection tests and the internal inspection tests performed on the Phoenix-Tucson line.

### **Determination of Necessity for Corrective Action Order and Right to Hearing**

Section 60112 of Title 49, United States Code, provides for the issuance of a Corrective Action Order, after reasonable notice and the opportunity for a hearing, requiring corrective action, which may include the suspended or restricted use of a pipeline facility, physical inspection, testing, repair, replacement, or other action as appropriate. The basis for making the determination that a pipeline facility is hazardous, requiring corrective action, is set forth both in the above referenced statute and 49 C.F.R. §190.233, a copy of which is enclosed.

Section 60112, and the regulations promulgated thereunder, provide for the issuance of a Corrective Action Order without prior opportunity for notice and hearing upon a finding that failure to issue the Order expeditiously will result in likely serious harm to life, property or the environment. In such cases, an opportunity for a hearing will be provided as soon as practicable after the issuance of the Order.

After evaluating the foregoing preliminary findings of fact, I find that the continued operation of the Phoenix-Tucson pipeline without corrective measures would be hazardous to life, property and the environment. Additionally, after considering the high number of metal loss instances attributable to corrosion, I find that a failure to issue this Order, requiring Respondent to maintain reduced operating pressure, expeditiously would result in likely serious harm to life, property, and the environment.

Accordingly, this Corrective Action Order mandating reduced operating pressure on the 6-inch Phoenix-Tucson line is issued without prior notice and opportunity for a hearing. The terms and conditions of this Order are effective upon receipt.

Within 10 days of receipt of this Order, Respondent may request a hearing, to be held as soon as practicable, by notifying the Associate Administrator for Pipeline Safety in writing, delivered personally, by mail or by telecopy at (202) 366-4566. Any hearing will be held in Houston, Texas or Washington, D.C. on a date that is mutually convenient to OPS and Respondent.

### **Required Corrective Action**

Pursuant to 49 U.S.C. § 60112, I hereby order Respondent to immediately take the following corrective actions with respect to segments 53 and 54 of its 6-inch Phoenix-Tucson line:

1. Maintain an operating pressure on the line that is equal to or less than 80% of the MOP.
2. Respondent may request approval from the Associate Administrator, OPS, to increase its operating pressure above the maximum operating pressure determined above under item 1, based on a showing that the hazard has been abated. OPS's approval must be in writing.

The procedures for the issuance of this Order are described in Part 190, Title 49, Code of Federal Regulations, § 190.233, a copy of which is enclosed, is made part of this Order and describes the Respondents's procedural rights relative to this Order. Failure to comply with this Order 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.

**Proposed Amendment to this Order to Address Metal Loss Caused by External Corrosion and Poor Coating Systems – Proposed Corrective Measures; Respondent's Right to a Hearing**

For the foregoing preliminary findings of fact, I also propose to impose additional corrective measures with respect to the Phoenix-Tucson line, and to require additional information about the condition of Respondent's entire pipeline system in Arizona, New Mexico, and Texas.

Accordingly, I propose to amend the Corrective Action Order to require Respondent to take the following actions:

With respect to segments 53 and 54 of its 6-inch Phoenix-Tucson line:

3. Develop and implement a work plan and schedule for performing coating evaluations on the line, using technology such as Coating Mapper or Direct Current Voltage Gradient.
  - (a) Submit this work plan and schedule to the Director, Southwest Region, for approval within 15 days of receipt of an amendment to this order.
  - (b) Submit a report of the data collected and findings made as a result of this work plan to the Director, Southwest Region, within 15 days of the completion date established by the approved work plan schedule.
4. Develop and implement a work plan and schedule for re-coating, repairing or replacing sections of the line that are determined by the coating evaluation to require remedial measures.

- (a) Submit this work plan and schedule to the Director, Southwest Region, for approval within 15 days of submission of the report required by action item 3(b), above.
  - (b) Submit a progress report of all remedial actions taken to the Director, Southwest Region, 120 days after approval of the work plan required by this action item, and every 120 days thereafter until each action required by the work plan is completed.
  - (c) Submit a final report on all remedial actions taken under the work plan to the Director, Southwest Region, within 30 days of completion of the final action required by this work plan.
5. 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 above.
- (a) Submit the work plan described in this action item to the Director, Southwest Region, for approval within 30 days of receipt of an amendment to this Order.
  - (b) Implement this work plan upon completion of the final action required by the work plan described in action item 4 above.
  - (c) 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.

With respect to its lines in Arizona, New Mexico and Texas:

6. Submit a report to the Director, Southwest Region, on all internal inspection tests that have been conducted on Respondent's pipeline system within the states of Arizona, New Mexico, and Texas since January 1, 1997, within 60 days of receipt of an amendment to this Order. The report shall include:
- (a) The final results of all internal inspection tests, as submitted to Respondent by persons or firms paid under contract to perform internal inspection tests.
  - (b) The repair criteria established by Respondent for each internal inspection test conducted.
  - (c) All other information relevant to the repairs made by Respondent in response to information revealed by internal inspection tests, including a complete description of the repair criteria and methods used in making repairs.
7. The Director, Southwest Region, may grant an extension of time, upon receipt of a written request stating reasons an extension is needed, for completion of any of the actions required in this Order or

any amendment to this Order.

Within 10 days of receipt of this Proposed Amendment, Respondent may request a hearing, to be held as soon as practicable, by notifying the Associate Administrator for Pipeline Safety in writing, delivered personally, by mail or by telecopy at (202) 366-4566. Any hearing will be held in Houston, Texas or Washington, D.C. on a date that is mutually convenient to OPS and Respondent.

If, after receiving and analyzing additional data in the course of this investigation, long-term corrective action is needed, Respondent will be notified of any additional measures required and amendment of this Order will be considered. To the extent consistent with safety, Respondent will be afforded notice and an opportunity for a hearing prior to the imposition of any additional corrective measures.

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Stacey Gerard  
Associate Administrator  
for Pipeline Safety

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Date Issued