



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

1200 New Jersey Ave, S.E.
Washington, D.C. 20590

October 22, 2015

VIA CERTIFIED MAIL AND FAX TO: (678) 762-2466

Mr. Tim Felt
President & Chief Executive Officer
Colonial Pipeline Company
1185 Sanctuary Parkway, Suite 100
Alpharetta, GA 30009-4765

Re: CPF No. 1-2015-5018H

Dear Mr. Felt:

Enclosed is an Amended Corrective Action Order issued in the above-referenced case, requiring Colonial Pipeline Company to take certain corrective actions with respect the failure of its Line #4 pipeline on September 21, 2015, in Centreville, Virginia. The amended order replaces and supersedes the original Corrective Action Order issued to Colonial on September 29, 2015.

Service is being made by certified mail, electric transmission, and facsimile. Service of the Amended Corrective Action Order by electronic transmission is deemed complete upon transmission and acknowledgement of receipt, or as otherwise provided under 49 C.F.R. § 190.5. The terms and conditions of this Order are effective upon completion of service.

Thank you for your cooperation in this matter.

Sincerely,

for Jeffrey D. Wiese
Associate Administrator
for Pipeline Safety

Enclosure

cc: Mr. Byron Coy, P.E., Regional Director, Eastern Region, OPS

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

In the Matter of)
)

Colonial Pipeline Company,)
)

Respondent.)
_____)

CPF No. 1-2015-5018H

AMENDED CORRECTIVE ACTION ORDER

Purpose and Background:

This Amended Corrective Action Order (Order) is being issued, under the authority of 49 U.S.C. § 60112, to require Colonial Pipeline Company (Colonial or Respondent), to take the necessary corrective action to protect the public, property, and the environment from potential hazards associated with the recent failure on Colonial's Line #4 pipeline.

On September 21, 2015, a reportable accident occurred on Colonial's Line #4 hazardous liquid pipeline in Centreville, Virginia, resulting in the release of approximately 4,000 gallons of gasoline (Failure). This pipeline transports petroleum products from Houston, Texas, to Linden, New Jersey. The accident occurred on a 288-mile section of Line #4 that runs between the company's Greensboro Tank Farm in Greensboro North Carolina, and the Dorsey Tank Farm in Woodbine, Maryland. Colonial operates a parallel pipeline, known as Line #3 that runs thirty feet apart from Line #4 at the site of the accident (Leak Site). Based on a visual inspection of the pipe, a leak occurred at a crack within a dent that was discovered on the bottom of Line #4. The root cause of the release has not yet been determined. Pursuant to 49 U.S.C. § 60117, the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), initiated an investigation of the accident.

On September 29, 2015 PHMSA issued a Corrective Action Order to Colonial. This Amended Corrective Action Order replaces and supersedes the CAO issued to Colonial on September 29, 2015.

The preliminary findings of the ongoing investigation are as follows.

Preliminary Findings:

1. Colonial operates roughly 5,500 miles of hazardous liquid transmission pipeline within the United States. The pipelines travel through the states of Texas, Louisiana,

Mississippi, Alabama, Georgia, North and South Carolina, Virginia, Maryland, Pennsylvania, New Jersey, and New York. Branches from the main lines also extend into Tennessee. The system delivers a daily average of approximately 100 million gallons of liquid petroleum products to businesses and communities throughout the Southern and Eastern United States.¹

2. The section of Line #4 at the Leak Site was constructed in 1963 and is composed of 32-inch diameter, 0.281" wall thickness (generally), API-5L, X52 pipe, has asphalt enamel coating and a double-submerged arc-welded (DSAW) seam type, manufactured by National Tube Company.
3. The Maximum Operating Pressure (MOP) of the section of Line #4 at the Leak Site is 657 psig, as established by hydrostatic testing in 1963. At the time of the Failure, the highest steady state operating pressure of Line #4 at the Leak Site, during the 60 days prior to the Failure on September 21, 2015 was 283 psig.
4. In response to reports from local residents of a gasoline odor near a retention pond approximately 1,000 feet from Lines #3 and #4 in Centreville, Virginia, on the morning of September 21, 2015, the Fairfax County Fire Department and Fairfax County Fire Marshall responded to the site of the retention pond.
5. Due to the reports of gasoline odor near the site of the retention pond in Centreville, Virginia, as well as the activity on the part of the Fairfax County Fire Department and Fairfax County Fire Marshall near this site, officials from Colonial arrived at this site by the evening of September 21, 2015. After arriving, these officials discovered large quantities of gasoline in the storm water system leading to the retention pond.
6. At 9:00 pm on September 21, 2015, Colonial acted to immediately isolate Lines 3 and 4 by closing remote-operated valves at the Chantilly, Virginia Station (downstream), and Remington, Virginia Station (upstream).²
7. At approximately 1:30 pm on September 22, 2015, an OPS investigator arrived at the Leak Site. A representative of the Virginia State Corporation Commission, in its capacity as interstate agent for PHMSA (VA-SCC) arrived at the Leak Site later in the afternoon on September 22, 2015.
8. On September 22, 2015, the National Transportation Safety Board (NTSB) informed the Director, Eastern Region, PHMSA, that NTSB officials were going to visit the Leak Site on September 23, 2015.
9. On September 22, 2015, at 1:32 am, Colonial made a report to the National Response Center (NRC Report No. 1129084), noting a sheen and odor of gasoline in the retention pond approximately 3,000 feet from Lines #3 and #4 in Centreville, Virginia.
10. On September 22, 2015 Colonial conducted an investigation by digging test holes around Lines #3 and #4 in order to identify the source of the leak. Colonial personnel later discovered a crack within a dent on the bottom of Line #4.

¹ Colonial Pipeline Company. Website: <http://www.colpipe.com/home/about-colonial> (last visited September 29, 2015).

² The isolation valves are separated by a distance of approximately 27 miles.

11. On September 23, 2015, officials from the NTSB arrived at the Leak Site. On this date, the NTSB also informed the Director that it was also launching an investigation into the Failure.
12. On September 23, 2015, at 4:23 pm, Colonial made a follow-up notification to the NRC ("Report No. 1129221). Colonial recovered approximately 2,000 gallons of the estimated 4,000 gallons released. As a precaution, three restaurants were closed by the Fairfax County Fire Marshal. The release caused significant soil contamination in the vicinity of the Leak Site and nearby storm water drainage piping and retention ponds.
13. The accident occurred within a High Consequence Area (HCA). There were no reported injuries or fatalities, and the released gasoline failed to ignite.
14. Based on a visual examination of the pipeline at the Leak Site, gasoline was released from a crack within a shallow dent located on the bottom of the pipe. However, the specific cause of the failure is still undetermined and the investigation is ongoing. The pipe at the Leak Site was excavated and examined on September 23, 2015. The Non-Destructive Examination (NDE) inspection and sleeve repair were made the following day on September 24, 2015, with final inspection and certification of welds on September 25, 2015.
15. Colonial had most recently identified the dent at the Leak Site and a similar dent 69 feet from the Leak Site during a 2013 in-line inspection (2013 ILI). During the 2013 ILI, it was determined that neither dent required repair or excavation, as both were less than two percent of the pipe diameter. On September 24, 2015, Colonial excavated the site of the second dent and confirmed that it did not appear to have any cracks or appear to be leaking.
16. Colonial installed a repair sleeve at the Leak Site. Colonial has indicated that it intends to remove the section of pipe containing the defect now under the repair sleeve for NTSB testing and analysis in an attempt to learn more about the metallurgy and failure mechanisms.
17. On September 25, 2015, following satisfactory installation of the B-Sleeve, the Director approved the temporary re-start of Line #4, which included a 20% reduction in operating pressure at the leak location, resulting in a temporary maximum pressure at this location of 223 psig.
18. Colonial and the Director agreed that as part of the temporary restart, Line #4 must be immediately shut down upon any sign of significant or unexplained pressure loss in Line #4 or leakage at the Leak Site. If any leaks occur, all pumps would be shut down and the line blocked on each side of the Leak Site.
19. The Director further directed, and Colonial agreed, that until the CAO was issued, Colonial is to maintain a 24 hour on-site presence at the excavation site, construct a temporary chain-link fence around the excavation and set a jersey-type barrier between the nearby dead-end street and the excavation site. Colonial also agreed to provide ongoing forecast information to PHMSA and VA-SCC about planned site work and provide an opportunity for inspections and compliance oversight.

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 or would be 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 notice and opportunity for hearing, upon a finding that failure to issue the Order expeditiously would result in the likelihood of serious harm to life, property, or the environment. In such cases, an opportunity for a hearing and expedited review will be provided as soon as practicable after the issuance of the Order.

After evaluating the foregoing preliminary findings of fact, I find that continued operation of the "Affected Segment," as defined below, without corrective measures is or would be hazardous to life, property, or the environment. Additionally, having considered the nature of the Failure; the unexplained existence of a dent in the pipeline 69 feet north of the joint of pipe that failed; the location of the Failure in an HCA and the resulting soil and water contamination in the vicinity of the Failure Site; the age of the pipeline; and the undetermined cause of the Failure, I find that failure to issue this Order expeditiously would result in the likelihood of serious harm to life, property, or the environment.

Accordingly, this Corrective Action Order mandating immediate corrective action 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 contest its issuance obtain expedited review either by answering in writing or requesting a hearing under 49 C.F.R. § 190.211, to be held as soon as practicable under the terms of such regulation, by notifying the Associate Administrator for Pipeline Safety in writing, with a copy to the Director, Eastern Region, PHMSA (Director). If Respondent requests a hearing, it will be held telephonically or in-person in the Eastern Region or Washington, D.C.

After receiving and analyzing additional data in the course of this investigation, PHMSA may identify other corrective measures that need to be taken. In that event, PHMSA will notify Respondent of any additional measures that are required and an amended Order issued, if necessary. 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.

Required Corrective Actions:

Pursuant to 49 U.S.C. § 60112, I hereby order Colonial to immediately take the following corrective actions for the Affected Segment and Isolated Segment of Line #4:

Definitions

The term "Affected Segment" means approximately 288 miles of Colonial's Line #4 between the Greensboro, North Carolina Tank Farm, and the Dorsey Tank Farm in Woodbine, Maryland.

The term "Isolated Segment" means the segment of Line #4 that is approximately 3.6 miles long and runs between the Compton Road Valve 10545+13 (upstream of leak) and Chantilly Junction MP 244 (downstream of leak) in or near Centreville, Virginia.

The term "Director" means the Director, Eastern Region, PHMSA.

The term "Failure Site" means refers to the location of the Isolated Segment that runs across the Leak Site, which is located at MP 241.

Corrective Actions

1. *Repair Plan.* Colonial must establish a plan to make a permanent repair at the Failure Site in accordance with applicable pipeline safety regulations. The plan must be submitted to the Director for prior approval. As noted above, while B-Sleeves are permanent repairs, Colonial is removing the B-Sleeve in this particular instance for NTSB testing and analysis in an attempt to learn more about the metallurgy and failure mechanisms.
2. *Pressure Restriction.* The operating pressure may not exceed 223 psig under steady state conditions, which is 80% of the highest steady state operating pressure at the Leak Site in the 60 days prior to the Failure on September 21, 2015. According to Colonial, hydraulic analysis shows that under transient conditions the pressure at the Leak Site could reach 284 psig.
3. *Removal of Pressure Restriction.* Upon written request from Colonial, the Director may allow the removal or modification of the pressure restriction when a reliable engineering analysis demonstrates that the pressure increase is safe, taking into consideration all known defects, anomalies, completion of the Repair Plan, and the operating parameters of the pipeline.
4. *Temporary Removal or Modification.* The Director may allow the pressure restrictions to be temporarily removed or modified upon written application from Colonial. In order to justify such a removal or modification, Colonial must demonstrate that mitigative and preventive measures will have been implemented prior to and during the temporary removal or modification of the pressure restriction. Colonial may appeal any determination under this Paragraph to the Associate Administrator for Pipeline Safety.
5. *Records Verification.* Colonial shall verify the records for the Affected Segment to confirm the MOP. Colonial must submit documentation of this record verification to the Director within 45 days of receipt of this Order.³
6. *Review of Prior ILI Results.*

Colonial must conduct a preliminary review of the results for any previous ILI run conducted on the Affected Segment to determine if any features with similar characteristics are present elsewhere on the Affected Segment. Colonial must complete the review within 15 days of receipt of this Order and must submit documentation of this review to the Director within 30 days of receipt of this Order.

Colonial must then conduct a detailed integrating review of the raw data for any previous ILI runs conducted on the Affected Segment since the line was constructed to determine

³ See PHMSA Advisory Bulletin 2012-06.

whether any features were present in the failed pipe joint, and to determine if any features with similar characteristics are present elsewhere on the Affected Segment. This detailed review must include a review of the ILI vendors' raw data and an analysis by an independent third party approved by PHMSA who is not the same vendor that initially evaluated the ILI results. Documentation of this detailed review must include the following:

- a) A list of all ILI tool runs, tool types, and the dates of the completion of the tool runs.
- b) A list describing the type, size, wall loss, etc., and the specific location of all ILI MOP-impacting, crack, dent, or other integrity-impacting features present in the failed joint and/or pipe in the Affected Segment.
- c) A list describing the (type, size, wall loss, etc.), and the specific location of all ILI features with similar characteristics present elsewhere on the Affected Segment.
- d) An explanation of the process used to review the ILI results and the results of the re-evaluation.

Documentation of this detailed review must be submitted to the Director within 90 days of receipt of this Order.

7. *Mechanical and Metallurgical Testing.* Mechanical and metallurgical testing, including failure analysis, will be done by the NTSB in accordance with NTSB procedures and protocols. In the event that the NTSB does not perform these functions, the Operator will be responsible for completing all testing and analysis. Details of this analysis will be defined if the NTSB does not perform the analysis.
8. *Root Cause Failure Analysis.* The NTSB will perform a root cause failure analysis (RCFA) to determine the cause of the Failure. In the event that the NTSB does not perform these functions, the Operator must perform and complete a RCFA and submit a final report of this RCFA to the Director. Details of the RCFA will be defined if the NTSB does not perform these tasks.
9. *Emergency Response Plan and Training Review.* Colonial must review and assess the effectiveness of its emergency response plan with regards to the Failure. Include in the review and assessment the on-scene response and support, coordination, and communication with emergency responders and public officials. Also, include a review and assessment of the effectiveness of its emergency training program. Colonial must amend its emergency response plan and emergency training, if necessary, to reflect the results of this review. The documentation of this plan and review must be available for inspection by OPS or provided to the Director, if requested.
10. *Public Awareness Program Review.* Colonial must review and assess the effectiveness of its Public Awareness Program within 90 days following receipt of this Order. Colonial must amend its program, if necessary, to reflect the results of this review. Documentation of this review must be made available to OPS upon request and to the Director.
11. *Remedial Work Plan (RWP).*
 - a) Within 90 days following receipt of this Order, Colonial must submit a RWP to the Director for approval.

- b) The Director may approve the RWP incrementally without approving the entire RWP.
- c) Once approved by the Director, the RWP will be incorporated by reference into this Order.
- d) The RWP must specify the tests, inspections, assessments, evaluations, and remedial measures Colonial will use to verify the integrity of the Affected Segment. It must address all known or suspected factors contributing to the Failure. Colonial should consider both the risk of another failure and the consequence of another failure to develop a prioritized schedule for RWP related work along the Affected Segment.
- e) The RWP must include a procedure or process to:
 1. Identify pipe in the Affected Segment with characteristics similar to the contributing factors identified for the Failure.
 2. Gather all data necessary to review the failure history (in service and pressure test failures) of the Affected Segment and to prepare a written report containing all the available information such as the locations, dates, and causes of leaks and failures.
 3. Integrate the results of the metallurgical testing, suspected cause, and other corrective actions required by this Order with all relevant pre-existing operational and assessment data for the Affected Segment. Pre-existing operational data includes, but is not limited to, construction, operations, maintenance, testing, repairs, prior metallurgical analyses, and any third party consultation information. Pre-existing assessment data includes, but is not limited to, ILI tool runs, hydrostatic pressure testing, direct assessments, close interval surveys, and DCVG/ACVG surveys.
 4. Determine if conditions similar to those contributing to the Failure are likely to exist elsewhere on the Affected Segment.
 5. Conduct additional field tests, inspections, assessments, and/or evaluations to determine whether, and to what extent, the conditions associated with the Failure and other failures from the operating history or any other integrity threats are present elsewhere on the Affected Segment. At a minimum, this process must consider all failure causes and specify the use of one or more of the following:
 - a. ILI tools that are technically appropriate for assessing the pipeline system based on the suspected cause of failure and that can reliably detect and identify anomalies;
 - b. Hydrostatic pressure testing;
 - c. Close-interval surveys;
 - d. Cathodic protection surveys, to include interference surveys in coordination with other utilities (e.g. underground utilities, overhead power lines, etc.) in the area;
 - e. Coating surveys;

- f. Stress corrosion cracking surveys;
 - g. Selective seam corrosion surveys; and
 - h. Other tests, inspections, assessments, and evaluations appropriate for the failure causes.
6. Describe the inspection and repair criteria Colonial will use to prioritize, excavate, evaluate, and repair anomalies, imperfections, and other identified integrity threats. Include a description of how any defects will be graded and a schedule for repairs or replacement.
 7. Ensure long-term periodic testing and integrity verification measures are described in maintenance procedures and incorporated in their integrity management program; to ensure the ongoing safe operation of the Affected Segment considering the results of the analyses, inspections, evaluations, and corrective measures undertaken pursuant to this Order.
 8. Include a proposed schedule for completion of the RWP.
 9. Colonial must revise the RWP as necessary to incorporate new information obtained during the failure investigation and remedial activities, to incorporate the results of actions undertaken pursuant to this Order, and/or to incorporate modifications required by the Director.
 - a. Submit any plan revisions to the Director for prior approval.
 - b. The Director may approve plan revisions incrementally.
 - c. Any and all revisions to the RWP after it has been approved and incorporated by reference into this Order will be fully described and documented in the CAO Documentation Report (CDR).
 10. Implement the RWP as it is approved by the Director, including any revisions to the plan.
12. *CAO Documentation Report.* Colonial must create and revise, as necessary, a CAO Documentation Report (CDR). When Colonial has concluded all the items in this Order it will submit the final CDR in its entirety to the Director. This will allow the Director to complete a thorough review of all actions taken by Colonial with regards to this Order prior to approving the closure of this Order. The intent is for the CDR to summarize all activities and documentation associated with this Order in one document.
- a. The Director may approve the CDR incrementally without approving the entire CDR.
 - b. Once approved by the Director, the CDR will be incorporated by reference into this Order.
 - c. The CDR must include, but not be limited to:
 - i. A Table of Contents;
 - ii. A summary of the Failure events and the response activities;
 - iii. A summary of pipe data/properties and all prior assessments of the

Affected Segment;

- iv. A summary of all tests, inspections, assessments, evaluations, and analysis required by this Order;
- v. A summary of the Mechanical and Metallurgical Testing as required by this Order;
- vi. Documentation of all actions taken by Colonial to implement the RWP, the results of those actions, and the inspection and repair criteria used;
- vii. Documentation of any revisions to the RWP, including those necessary to incorporate the results of actions undertaken pursuant to this Order and whenever necessary to incorporate new information obtained during the failure investigation and remedial activities;
- viii. Lessons learned while completing this Order;
- ix. A path forward describing specific actions Colonial will take on its entire pipeline system as a result of the lessons learned from work on this Order; and
- x. Appendices (if required).

Other Requirements:

1. *Reporting.*

Monthly - Colonial must submit monthly reports to the Director that: (1) include all available data and results of the testing and evaluations required by this Order; and (2) describe the progress of the repairs or other remedial actions being undertaken. The first monthly report is due November 1, 2015, for the month of October 2015.

Quarterly – Colonial must also submit quarterly reports to the Director. The first quarterly report is due on January 5, 2016, for the period October 1, 2015, through December 31, 2015.

Monthly reports will be due 5 days after the first of each month. Quarterly reports will be due 10 days after the first of each month.

- a. For example, the first monthly report will cover the time period from October 1, 2015, through October 31, 2015, and is due by November 5, 2015.
- b. The first quarterly report will cover the time period from October 1, 2015 to December 31, 2015, and is due by January 10, 2016.

The requirement for monthly and quarterly report submittals will terminate upon closure of the Amended Corrective Action Order. The Director may change the interval for the submission of these reports.

2. *Documentation of Costs.* It is requested but not required that Respondent maintain documentation of the costs associated with implementation of this Order. Include in each monthly report the to-date total costs associated with: (1) preparation and revision of procedures, studies and analyses; (2) physical changes to pipeline infrastructure, including repairs, replacements and other modifications; and (3) environmental remediation, if applicable.

3. *Approvals.* With respect to each submission requiring the approval of the Director, the Director may: (a) approve the submission in whole or in part; (b) approve the submission on specified conditions; (c) modify the submission to cure any deficiencies; (d) disapprove the submission in whole or in part and direct Respondent to modify the submission; or (e) any combination of the above. In the event of approval, approval upon conditions, or modification by the Director, Colonial shall proceed to take all action required by the submission, as approved or modified by the Director. If the Director disapproves all or any portion of a submission, Respondent must correct all deficiencies within the time specified by the Director and resubmit it for approval.
4. *Extensions of Time.* The Director may grant an extension of time for compliance with any of the terms of this Order upon a written request timely submitted and demonstrating good cause for an extension.

The actions required by this Order are in addition to and do not waive any requirements that apply to Respondent's pipeline system under 49 C.F.R. Part 195, under any other order issued to Respondent under authority of 49 U.S.C. § 60101, *et seq.*, or under any other provision of Federal or State law.

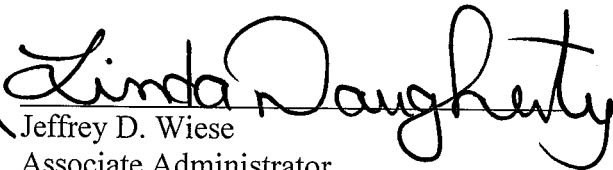
Respondent may appeal any decision of the Director to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.

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).

Failure to comply with this Order may result in the assessment of civil penalties and in referral to the Attorney General for appropriate relief in United States District Court pursuant to 49 U.S.C. § 60120.

In your correspondence on this matter, please refer to CPF No. 1-2015-5018H and for each document you submit, please provide a copy in electronic format whenever possible.

The terms and conditions of this Amended Corrective Action Order are effective upon receipt.


Jeffrey D. Wiese
Associate Administrator
for Pipeline Safety

OCT 22 2015

Date Issued