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

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

VIA CERTIFIED MAIL AND FAX TO: 713-646-4378

Mr. Greg Armstrong
Chairman and CEO
Plains Pipeline, L.P.
333 Clay Street, Suite 1600
Houston, TX 77002

Re: CPF No. 5-2015-5011H

Dear Mr. Armstrong:

Enclosed is Amendment No. 3 to the Corrective Action Order issued in the above-referenced case on May 21, 2015. It requires Plains Pipeline, LP, to take additional corrective actions with respect to Lines 901 and 903 of its pipeline system. Service is being made by certified mail and facsimile. Service of this Amendment 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 continued cooperation in this matter.

Sincerely,

Alan K. Mayberry
Acting Associate Administrator
for Pipeline Safety

Enclosure

cc: Ms. Linda Daugherty, Deputy Associate Administrator for Field Operations, OPS, PHMSA
Mr. Chris Hoidal, Director, Western Region, OPS, PHMSA
Mr. Dean Gore, Vice President, Environmental and Regulatory Compliance, Plains Pipeline, L.P.

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

In the Matter of	)	
Plains Pipeline, LP,	)	**CPF No. 5-2015-5011H**
Respondent.	)	

AMENDMENT NO. 3 TO THE CORRECTIVE ACTION ORDER

Purpose and Background:

On May 21, 2015, the Pipeline and Hazardous Materials Safety Administration's (PHMSA) Associate Administrator for Pipeline Safety (Associate Administrator) issued a Corrective Action Order (CAO) under the authority of 49 U.S.C. Section 60112 to require Plains Pipeline, L.P. (Plains or Respondent), to take certain corrective actions to protect the public, property, and the environment from potential hazards associated with Plains' Line 901[1] in Santa Barbara County, California. The CAO was issued in response to a May 19, 2015 failure on Line 901 that caused a release of approximately 2,934 barrels of heavy crude oil (Failure). Among the requirements of the CAO were that the Line 901 be shut down, purged of crude oil, and filled with an inert gas, which Plains accomplished as of June 18, 2015. The CAO also required Plains to develop and submit to the Director, OPS Western Region, PHMSA (Director), for approval a Remedial Work Plan, detailing Plains' investigation of the Failure and its plan to remediate all actionable anomalies on Line 901. Further, the CAO required Plains to develop and submit a Restart Plan for Line 901 to the Director, with specific content requirements.

On June 3, 2015, the Associate Administrator issued Amendment No. 1 to the CAO, which required Plains to take certain additional corrective actions with respect to Line 901 and a similarly-constructed, downstream Plains pipeline known generally as Line 903. This pipeline carries all of Line 901's crude-oil throughput, is a 30-inch diameter pipeline approximately 129.5 miles in length, and consists of three segments: (1) Gaviota Station to Sisquoc Station; (2) Sisquoc Station to Pentland Station; and (3) Pentland Station to Emidio Station. Plains voluntarily shut down the Gaviota-to-Pentland segments of Line 903 on May 30, 2015, but

[1] Line 901 is a 24-inch diameter pipeline approximately 10.6 miles in length that transports crude oil from ExxonMobil's breakout storage tanks in Las Flores Canyon to Plains' Gaviota Pump Station. *See* CAO, at page 1.

continued operating the Pentland-to-Emidio segment at a reduced pressure under the terms of Amendment No. 1.

On November 12, 2015, the Associate Administrator issued Amendment No. 2 to the CAO, which required Plains to take certain additional corrective actions on Line 903. The Gaviota-to Pentland segments of Line 903 remained idle but were full of crude oil. Therefore, Amendment No. 2 ordered Plains to purge Line 903 between Gaviota and Pentland Stations, fill it with an inert gas, and shut down the line between those stations. However, Amendment No. 2 did not require Plains to develop or submit a Remedial Work Plan or Restart Plan for any portion of Line 903.

Line 903 between Gaviota and Pentland Stations was subsequently purged and filled with nitrogen gas in three phases between December 2015 and April 2016. That portion of Line 903 is currently shut down and Plains cannot operate Line 903 from Gaviota to Pentland until authorized to do so by the Director.

Beginning immediately after the Failure, PHMSA initiated an investigation of the Failure pursuant to 49 U.S.C. Section 60117. On May 19, 2016, PHMSA completed its investigation and released its Failure Investigation Report (FIR), which identified proximate and contributory causes of the Failure on Line 901.

Additional Preliminary Findings:

- This Amendment No. 3 hereby adopts and incorporates all of the Preliminary Findings contained in the CAO and the two prior amendments described above. In the event of any conflict between the Additional Preliminary Findings contained in this Amendment No. 3 and any other Preliminary Findings in the CAO or the two prior amendments, the Additional Preliminary Findings contained herein shall control.

- The FIR concluded that the proximate or direct cause of the Line 901 Failure was external corrosion that thinned the pipe wall to a level where it failed suddenly and the pipeline ruptured. The FIR identified numerous contributory causes of the Failure, which can be grouped into three categories: (1) ineffective protection against external corrosion of the pipeline; (2) failure by Plains to detect and mitigate the corrosion; and (3) lack of timely detection of and response to the Failure.

- The FIR contained several findings and recommendations pertinent to this Amendment, derived in part from several other PHMSA-mandated reports and investigations, as follows:

    1) The *Final Report on Line 901 Release (5/19/2015) Technical Root Cause Analysis* (Final RCA) by Det Norske Veritas (U.S.A.), Inc. (DNV), released on December 4, 2015, in which DNV identified four basic root causes of the Failure:
        a. The external coating system failed to prevent moisture from reaching the pipe steel, allowing the external corrosion process to occur;
        b. The cathodic-protection system was ineffective due to shielding by the thermal polyurethane insulation and external polyethylene wrap;

c. The contracted in-line inspection (ILI) significantly undersized the external corrosion feature that failed on Line 901; and
d. The mitigative actions taken by Plains on Line 901 did not adequately address the elevated integrity threat of corrosion under insulation (CUI).

2) The Final RCA identified the following improvements that could be made to Plains' integrity management program:
   a. Plains could adopt additional practices to identify and address inaccuracies in future ILI runs;
   b. Plains could better incorporate the results from multiple ILI runs into its corrosion growth-rate calculations; and
   c. Plains should improve its documentation and/or record-keeping of the company's decision-making processes related to actions taken.

3) PHMSA's review of Plains' prior ILI reports shows that the original interaction criteria used by the ILI vendor did not provide an accurate representation of metal loss anomalies. Plains' as-found field measurements of corrosion anomalies were inconsistent with the as-called vendor-provided ILI data and analytical reports. ILI surveys conducted in 2007 and 2012 revealed inconsistencies in the character of the anomalies. In both these cases, Plains did not consult the ILI vendor to help resolve the inconsistency as per their IMP procedures. .

4) PHMSA's review of Plains' control room management procedures and operations identified concerns with the supervisory control and data acquisition (SCADA) system, leak detection system, and controller's response to operating conditions on Lines 901 and 903. Those concerns include:
   a. The controller did not have information from the SCADA system provided in a manner allowing successful detection of abnormal operation. The pipeline SCADA system did not have safety-related alarms on low pressure configured at the correct value or priority to alert the control room staff of the rupture.
   b. The pipeline leak detection system lacked instrumentation and associated calculations to monitor line pack.
   c. Control room staff training lacked formalized and succinct requirements, including emergency shutdown and leak detection functions such as alarms.

- Since the issuance of Amendment No. 2, the following events have occurred with respect to Line 901:

  On May 11, 2016, PHMSA received Plains' *Final Line 901 Remedial Work Plan.* This plan was initially submitted on July 30, 2015, and has been revised by Plains several times, based on comments and requests for additional information from PHMSA. Completion of the Remedial Work Plan is required prior to the Director approving a restart plan for Line 901.

  The components of the *Final Line 901 Remedial Work Plan* included:

1) Investigation and remediation of anomalies on Line 901 (including anomalies requiring repair per 49 C.F.R. § 195.452(h) and anomalies with similar ILI signal characteristics to the Failure site);
2) Analysis of field measurements taken from anomaly investigations;
3) Re-grade of previous ILI data from 2012 and 2015 ILI surveys, using an expanded set of interaction criteria;
4) Additional integrity assessments using a circumferential magnetic flux leakage (MFL-C) ILI tool and integration of MFL-C ILI data with previous ILI survey results;
5) Investigation and remediation of anomalies identified in the MFL-C tool run (if any);
6) Improving Plains' integrity management program (IMP) based on information collected from the Remedial Work Plan and the Final RCA by DNV; and
7) Integrity studies to reduce spill volumes, including an emergency flow-restriction device (EFRD) evaluation and a surge study.

The CAO required Plains to develop and submit a written Restart Plan for Line 901 to the Director prior to resuming operation of Line 901. The requirements for the Restart Plan for Line 901 provided in the CAO do not address all of the preliminary findings contained in the Final RCA by DNV and PHMSA's own review of prior ILI reports and control room management procedures and operations.

- Since the issuance of Amendment No. 2, the following events have occurred with respect to Line 903:

  The Pentland-to-Emidio segment of Line 903, which is not directly connected to the segments of Line 903 running between Gaviota and Pentland, is the only portion of Line 903 that continues to operate. Crude oil can only enter the Pentland-to-Emidio segment via tankage. This segment has certain features and characteristics that currently distinguish it from the other segments of Line 903, including:

  - The crude oil transported by the Pentland-to-Emidio section is typically sourced from local gathering systems and is at a higher temperature (approximately 140 degrees Fahrenheit) than the crude oil normally sourced from Line 901.
  - The terrain of the 15-mile Pentland-to-Emidio segment is mostly flat, with a slight downhill gradient towards Emidio, and therefore does not exhibit the highly-variable hill/valley relief of the Gaviota-to-Pentland segment.
  - Due to the different crude oil sources for this segment, the higher crude-oil temperature, and relatively flat pipeline, this section of the pipeline has fewer anomalies, despite being constructed similarly to the rest of Line 903.
  - This segment of Line 903 was last inspected by an ILI tool in February 2014. On September 10, 2015, Plains performed a compression wave ultrasonic (UT) ILI tool run through the Pentland-to-Emidio segment to gather additional information about the condition of the pipeline. Based on the ILI vendor's UT ILI survey results, Plains has investigated and is in the process of remediating several anomalies on this segment as part of a verification process. All confirmation digs and repairs (with one exception due to a permit issue) have been completed.

The leak-detection system and control-room oversight for Line 903 are the same as those used for Line 901.

Historically, Line 901 transported crude oil from Las Flores and Gaviota Stations into Line 903, terminating at Pentland Station, where the oil entered into a series of breakout storage tanks. It is necessary to have Line 903 operating in conjunction with Line 901 when Line 901 returns to service.

The CAO and Amendments No. 1 and 2 did not provide provisions for a Remedial Work Plan, a Restart Plan, or return to service for Line 903's Gaviota-to-Pentland segment, including pressure restrictions, despite the similar construction, maintenance, and operating conditions of the two lines.

Determination of Necessity for Amendment to the 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 preliminary findings in the CAO, Amendment No. 1, Amendment No. 2, and the Additional Preliminary Findings set forth above, I find that continued operation of Line 901 and Line 903 without additional corrective measures is or would be hazardous to life, property, or the environment. Additionally, having considered the root cause and the numerous contributory causes of the Failure, the location of the Failure, the similar characteristics and conditions on Lines 901 and Line 903, the crude oil being transported, and the proximity of both pipelines to the Pacific Ocean and environmentally-sensitive areas, I find that a failure to issue this Order expeditiously to require immediate corrective action would result in the likelihood of serious harm to life, property, or the environment. For these reasons, it is necessary to align the corrective actions of the CAO and Amendments No. 1 and 2 to clarify that PHMSA's requirements on Lines 901 and 903 must be similar, particularly for the Gaviota-to-Pentland segment of Line 903.

Accordingly, this Amendment No. 3 to the 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 Amendment, Respondent may contest its issuance and obtain expedited review either by responding 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, Western Region, OPS (Director). If Respondent requests a hearing, it will be held telephonically or in-person in Lakewood, Colorado, or Washington, D.C.

After receiving and analyzing additional data during the course of this investigation, PHMSA may identify other corrective measures that need to be taken on Line 901 or Line 903. In that event, PHMSA will notify Respondent of any additional measures that are required and another Amendment Order will be 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. Section 60112, I hereby order Plains to immediately take the following corrective actions:

With respect to Line 901:

1. **Additional Requirements for the Line 901 Restart Plan.** In addition to the requirements under the CAO, Amendment No. 1, and Item 2 of this Amendment No. 3, any Restart Plan and request to return Line 901 to service must include:
    a. Improvements to Plains' IMP, incorporating the findings of the Final RCA report by DNV.
    b. Midland Control Room enhancements, including:
        1) Implementation of advanced leak detection capabilities that include mass balance and line pack calculations (the total volume of liquid present in a pipeline section). The leak detection improvements shall include:
            i. Revised alarm threshold adjustments;
            ii. Additional required instrumentation;
        2) Review and update of the alarm set-point values for pressures and flows to account for hydraulics and the interaction of topography, pipeline status (running or shutdown), sensor location, and historical pressure and flow values by configuration, in order to provide a basic level of leak detection when the pipeline is down and not running. Dynamic alarm limits based on pipeline status shall be used if hydraulically required;
        3) Implementation of modifications to the existing alarm priority/severity system to incorporate low and high pressure and flow values in major or safety-related alarm (SRA) categories;
        4) Implementation of emergency shutdown programming associated with Line 901 that can be executed by the Shift Supervisor or Controller;
        5) Development and implementation of training associated with emergency shutdown programming described in Item 1(b)(4) above; and

6) Provision of additional controller training that incorporates awareness of abnormal operations and reduced-pressure operational characteristics, including alarm set-point revisions for conditions similar to the Failure.

c. Elimination and documentation of actions taken to prevent inappropriate, uncommanded Valve 460 (Sisquoc Conoco) status and position changes;
d. Installation of additional safety valves as a result of Plains' EFRD evaluation;
e. Installation of additional pressure sensors as a result of Plains' surge study;
f. Review, update and submission of a revised Facility Response Plan to include drainage, culverts, high population areas, NRC notification procedures, and lessons learned from the Failure. Additional training of Plains personnel, control room personnel, contractors, and oil spill response organizations must be included in the revised Facility Response Plan;
g. Incorporation and implementation of the provisions of the CAO, Item #11 "Emergency Response Plan and Training Review," for Line 901 as a part of the Restart Plan.;
h. Initiation of a UT ILI within 7 days after steady-state operation is achieved in accordance with an ILI schedule approved by the Director. The tool run must be initiated during daylight hours. If the tool run does not collect a complete data set, the UT tool must be promptly re-run. A report from the ILI tool vendor must be completed within 30 days of running the tool. Plains must complete its review and analysis of the ILI report within 15 days of receiving the report. Provisions must be made to address any immediate repairs that result from an initial data analysis of the UT tool run;
i. Submission of a written Restart Plan for Line 901 to the Director for prior approval at least 60 days in advance of a scheduled startup.

2. **Corrosion Prevention.** Plains must include a long-term plan to address CUI on Line 901 that meets the requirements of 49 C.F.R. Part 195, Subpart H in any Restart Plan. Plains may address the inadequate corrosion prevention through any method approved by the Director, including, but not limited to, the following:
   a. Replacing the buried and insulated pipeline on Line 901;
   b. Repairing or re-coating compromised portions of the coating on Line 901; or
   c. Submitting a request for a Special Permit at least 120 days in advance of a scheduled startup, in accordance with 49 C.F.R. § 190.341. Any application for a Special Permit submitted pursuant to this Item must include a long-term, continuous monitoring plan to address the ineffective CP under insulation. At a minimum, the plan must contain provisions to mitigate the threat of CUI, including all of the following provisions:
      1) Accelerated reassessments;
      2) Usage of the appropriate, complementary assessment tools for all threats, including stress corrosion cracking;
      3) Coordination of data from the appropriate alternating ILI technologies;
      4) More stringent repair criteria targeted at CUI; and
      5) Advanced data analysis techniques to account for the potential growth of CUI including interaction criteria for anomaly assessment.

With respect to Line 903 between Gaviota and Pentland Stations:

3. **Remedial Work Plan.** Plains must provide, within 45 days of receipt of this Order, a Remedial Work Plan for the Gaviota-to-Pentland segment of Line 903 to the Director for his approval. Completion of this Remedial Work Plan is required prior to the startup of Lines 901 and 903. The Remedial Work Plan must include the following components:
    a. Investigation and remediation of anomalies on Line 903 (including anomalies requiring repair under 49 C.F.R § 195.452(h) and anomalies with similar ILI signal characteristics to the Failure site);
    b. Analysis of field measurements taken from anomaly investigations;
    c. Re-grade of previous ILI data from tool runs performed from 2012 to the present using an expanded set of interaction criteria;
    d. Additional integrity assessments using a MFL-C ILI tool and integration of MFL-C ILI data with previous ILI survey results;
    e. Investigation and remediation of anomalies that are identified in the MFL-C tool run (if any);
    f. Revision of Plains' IMP, based on information collected from the Remedial Work Plan as approved by the Director and the Final RCA by DNV for Line 901; and
    g. Integrity studies to reduce spill volumes, including an EFRD evaluation and a surge study, similar to those described for Line 901 in Item 1 of this Amendment.

4. **Restart Plan.** After completing the Remedial Work Plan described above in Item 3 and prior to resuming operation of Line 903 between Gaviota and Pentland Stations, Plains must develop and submit a written Restart Plan for this segment of Line 903 that meets all requirements of Item 8 of the CAO, as well as Items 1 and 2 of this Amendment No. 3, to the Director for prior approval at least 60 days in advance of a scheduled startup. The Restart Plan must include:

    a. Provisions for adequate patrolling of Line 903 during the restart process and include incremental pressure increases during start-up, with each increment to be held for at least 2 hours;

    b. Sufficient surveillance of the pipeline during each pressure increment to ensure that no leaks are present when operation of the line resumes; and

    c. Provisions for a daylight restart and advance communications with local emergency response officials.

    Once approved by the Director, the Restart Plan will be incorporated by reference into this Order.

5. **Return to Service.** After the Director approves the Restart Plan for the Gaviota-to-Pentland segment of Line 903, Plains may return that segment to service, but the operating pressure must not exceed eighty percent (80%) of the highest pressure sustained for a continuous 8-hour period between April 19, 2015, and May 19, 2015, for Line 903 (Gaviota to Sisquoc and Sisquoc to Pentland segments). The Pentland-to-Emidio segment of Line 903, currently operating at a reduced pressure, may continue operation under the terms of Amendment No. 1 and Paragraph 7 below.

6. **Removal of Pressure Restriction.** After a return to service, Plains may request a removal of the pressure restriction for the Gaviota-to-Pentland segment of Line 903.

    a. The Director may allow the removal or modification of the pressure restriction upon a written request from Plains demonstrating that restoring the pipeline to its pre-Failure operating pressure is justified, based on a reliable engineering analysis, which must consider all known defects, anomalies, and operating parameters of the pipeline in order to show that the pressure increase is safe.
    b. The Director may allow the temporary removal or modification of the pressure restrictions upon a written request from Plains demonstrating that temporary mitigative and preventive measures will be implemented prior to and during the temporary removal or modification of the pressure restriction. The Director's determination will be based on consideration of the Failure's cause and Plains' evidence that preventive and mitigative actions provide for the safe operation of Line 903 during the temporary removal or modification of the pressure restriction. Requests for removal of pressure restriction may be submitted by pipeline segment.

With respect to <u>Line 903 between Pentland and Emidio Stations</u>:

7. **Pressure-Restriction Removal Plan.** To remove the pressure restriction placed on the Pentland-to-Emidio segment of Line 903 by Amendment No. 1, Plains must develop and submit a written Pressure-Restriction Removal Plan for Line 903 between Pentland and Emidio Stations to the Director for prior approval at least 60 days in advance of a scheduled pressure increase. In order to remove the Pentland-to-Emidio pressure restriction, the process under Item 6 of this Amendment No. 3 must also be followed.

    a. Plains must have completed all integrity activities and remedial actions that resulted from its ILI vendor's data analysis of the September 2015 UT ILI run.
    b. The Pressure-Restriction Removal Plan must provide for adequate patrolling of Line 903 between Pentland and Emidio Stations during the start-up process and must include incremental pressure increases during start-up, with each increment to be held for at least 2 hours.
    c. The Pressure-Restriction Removal Plan must include sufficient surveillance of the pipeline during each pressure increment to ensure that no leaks are present when operation of the line resumes.
    d. The Pressure-Restriction Removal Plan must specify a day-light startup and must include advance communications with local emergency response officials.
    e. Once approved by the Director, the Pressure-Restriction Removal Plan will be incorporated by reference into this Order.

With respect to both Line 901 and Line 903:

8. **Notifications.** Plains must provide notification to the Director within 5 business days of the following events: any investigation and remediation field actions for identified anomalies (i.e. digs and repairs), ILI tool runs, and/or startup dates.

9. **Reporting Requirements.** The Corrective Action Order Documentation Report required by Item 12 of the May 21, 2015 CAO must include a summary of all inspections, assessments, evaluations, and analysis required by this Amendment No. 3.

The corrective actions required by this Amendment No. 3 are in addition to and do not waive any requirements that apply to Respondent's pipeline system under the CAO, all prior amendments to the CAO, 49 C.F.R. Part 195, any other order issued to Respondent under authority of 49 U.S.C. Section 60101, et seq., or 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. Section 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. Section 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. Section 60120.

In your correspondence on this matter, please refer to CPF No. 5-2015-5011H and for each document you submit, please provide a copy in electronic format whenever possible.

The terms and conditions of this Amendment No. 3 are effective upon receipt.

Alan Mayberry
Acting Associate Administrator
for Pipeline Safety

Date Issued