

**December 6, 2016**

**VIA CERTIFIED MAIL AND FAX TO:**

Mr. Graham Bacon  
Executive Vice President, Operations and Engineering  
Enterprise Products Operating, LLC  
1100 Louisiana Street  
Houston, Texas 77002

**CPF No. 3-2016-5010H**

Dear Mr. Bacon:

Enclosed is a Corrective Action Order issued in the above-referenced case. It requires Enterprise Products Operating, LLC, to take certain corrective actions with respect to your 10-inch East Red Line (ethane-propane mix) pipeline that failed on November 29, 2016, in Platte County, Missouri. Service is being made by certified mail and facsimile. Your receipt of this Corrective Action Order constitutes service of that document under 49 C.F.R. § 190.5. The terms and conditions of the Order are effective upon receipt.

We look forward to the successful resolution of the concerns arising out of this accident and to ensure the safe operation of Enterprise's pipeline facilities. Please direct any questions on this matter to Allan Beshore, Region Director, Central Region, OPS, at (816) 329-3811.

Sincerely,

Alan K. Mayberry  
Acting Associate Administrator  
for Pipeline Safety

Enclosure: Corrective Action Order and Copy of 49 C.F.R. § 190.233

cc: Ms. Linda Daugherty, Deputy Associate Administrator for Field Operations, OPS  
Mr. Allan Beshore, Region Director, OPS  
Mr. Jeffrey Morton, Director, Transportation Compliance, Enterprise Products Operating, LLC, JCMORTON@eprod.com

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

In the Matter of	)	
	)	
Enterprise Products Operating, LLC,	)	CPF No. 3-2016-5010H
	)	
Respondent.	)	
	)	
	)	
	)	

**CORRECTIVE ACTION ORDER**

**Purpose and Background:**

This Corrective Action Order (Order) is being issued under authority of 49 U.S.C. § 60112 to require Enterprise Products Operating, LLC (Enterprise or Respondent), to take the necessary corrective actions to protect the public, property, and the environment from potential hazards associated with a release from its 10-inch East Red Line ethane-propane mix interstate transmission pipeline in Platte County, Missouri.<sup>1</sup> This Order finds that continued operation of that portion of Respondent’s 10-inch East Red Line ethane-propane mix pipeline system running from the Conway (KS) Pump Station to approximately 3 miles east of the Kearney (MO) Pump Station at MP 212 (*Affected Segment*), without corrective action, is or would be hazardous to life, property, or the environment and requires Respondent to take immediate action to ensure its safe operation.

On November 29, 2016, a reportable accident occurred on the *Affected Segment* approximately 5.6 miles to the northwest of Smithville, Missouri, resulting in the release of approximately 5,000 barrels of ethane-propane mixture (Failure). The Failure occurred at Milepost (MP) 191, between the McLouth Pump Station and the Kearney Pump Station on the *Affected Segment*. The escaping product ignited and the fire was allowed to burn out. There were no evacuations or injuries associated with the Failure. The cause of the Failure 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. The preliminary findings of the agency's ongoing investigation are as follows:

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<sup>1</sup> Enterprise Products Operating, LLC’s East Red Line is part of the MAPCO pipeline system present in 13 states. The MAPCO pipeline system is a Natural Gas Liquids (NGL) pipeline system consisting of four primary segments, totaling approximately 8,074 miles in length. The 2,113-mile Conway North pipelines (East Red and Blue lines) link the NGL hub at Conway, Kansas, to refineries, petrochemical plants and propane markets in the upper Midwest.

**Preliminary Findings:**

- At approximately 6:40 p.m. CST (all times are CST unless otherwise indicated) on November 29, 2016, a rupture occurred on the Enterprise 10-inch diameter East Red Line.
- The accident was initially reported by the public to the National Response Center at 7:56 pm CDT on November 29, 2016 (NRC Report No. 1165213), indicating a 5,000-barrel release of ethane-propane mix.
- The released product ignited, which resulted in a large fire that caused severe vegetation damage. The fire was allowed to burn out. There have been no reported injuries or significant property damage. There have been no evacuations or reports of structures being impacted.
- The failure was isolated to within a 2.5 mile section of the pipeline by closing block valves at approximate MP 190 and MP 193 (*Isolated Segment*). The operating pressure at the time of failure was 1231 psig at the McLouth Pump Station (upstream).
- The Failure occurred on the *Affected Segment*, which is a bi-directional system with a Maximum Operating Pressure (MOP) of 1236 psig.
- The *Affected Segment* was installed in 1970. It is 10-inch nominal diameter, 0.188" wall thickness, API 5LX Grade X52 line pipe manufactured by Republic Steel. The pipe has a high-frequency ERW longitudinal seam and is coated with a polyethylene tape coating.
- The pipeline was last tested hydrostatically in 2002. The pipeline was most recently assessed in 2014, using inline inspection (ILI).
  - There have been a number of significant failures along this portion of the pipeline system, including failures related to stress corrosion cracking, excavation damage, and material failures. A stress corrosion cracking failure occurred on the *Affected Segment* on December 27, 2005, that released 3,113 barrels of product in Leavenworth County, Missouri. A failure due to earth movement occurred on the *Affected Segment* on March 30, 2010, that released 656 barrels of product in Chariton County, Missouri.
- On June 6, 2001, the Research and Special Programs Administration - PHMSA's predecessor - issued a Corrective Action Order [CPF 3-2001-5011H] to Williams Energy Services (Williams) - Respondent's predecessor - which required Williams to conduct a detailed metallurgical analysis of the failed pipe. The 2001 accident involved a rupture initiated in the longitudinal seam.
- In 2003, the Office of Pipeline Safety issued an Advisory Bulletin regarding the threat

of stress corrosion cracking.

- Ethane and propane are highly volatile liquids that will form a vapor cloud when released into the atmosphere. The vapor cloud generated by the release of the propane and ethane mixture will stay close to the ground and follow the surrounding terrain and accumulate in low areas.
- The area around the failure site was a low area. This type of product may accumulate in ditches adjacent to highways and other roadways, valleys and streams.
- The PHMSA investigation is on-going and information could change. This Order may be amended based on further findings.

### **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 and 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 likely result in 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 and considering the ongoing investigation of the Failure, I find that the continued operation of the *Affected Segment* without corrective measures is or would be hazardous to life, property and the environment. Additionally, after considering the age of the pipe, the circumstances surrounding the Failure, the hazardous nature of the product being transported, the pressure required for transporting the material, the method of manufacture, the uncertainties as to the cause of the Failure, the prior failures on the *Affected Segment*, and the ongoing investigations to determine the cause of the Failure, I find that a failure to issue this Order expeditiously to require immediate corrective action would result in likely serious harm to life, property, and 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 request a hearing, to be held as soon as practicable, by notifying the Associate Administrator for Pipeline Safety in writing, with a copy to the Director, Central Region, PHMSA (Director). If a hearing is requested, it will be held telephonically or in-person in Kansas City, Missouri.

After receiving and analyzing additional data in the course of this investigation, PHMSA may identify other corrective measures that need to be taken. 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.

### **Required Corrective Actions:**

#### ***Definitions:***

*Affected Segment* means the segment of Respondent's 10-inch East Red Line pipeline system running from Conway (KS) Pump Station to approximately 3 miles east of the Kearney (MO) Pump Station at MP 212.

*Isolated Segment* means the segment of the pipeline from the valve at MP 190 to the valve at MP 193 that was shut down and isolated in response to the Failure.

*Failure Site* means the pipeline section on the *Affected Segment* where the failure occurred on November 29, 2016, at MP 191 between the McLouth and Kearney pump stations.

Pursuant to 49 U.S.C. 60112, I hereby order Enterprise to immediately take the following corrective actions for the *Affected Segment*:

1. ***Shutdown of the Isolated Segment.*** The 10" Enterprise East Red Line Pipeline from the valve at MP 190 to the valve at MP 193 is currently out of service. This *Isolated Segment* must remain shut down until the Central Region Director has provided written approval to Enterprise to resume operations. The *Affected Segment* is subject to the pressure restriction set forth in Item 4 below.
2. ***Restart Plan.*** Prior to resuming operation of the *Isolated Segment*, Enterprise must develop and submit a written Restart Plan to the Director for prior approval. The Restart Plan must provide for the safe restart and operation of the *Isolated Segment* and address any findings associated with the Failure that require remedial measures prior to restart.
  - a. Once approved by the Director, the Restart Plan will be incorporated by reference into this Order.
  - b. The Restart Plan must provide for adequate patrolling of the *Isolated Segment* during the restart process and include sufficient surveillance of the pipeline to ensure that no leaks are present when operation of the line resumes.
  - c. The Restart Plan must specify a day-light restart and include advance communications with local emergency response officials.
3. ***Return to Service.*** After the Director approves the Restart Plan, Enterprise may return the *Isolated Segment* to service but the operating pressure must not exceed eighty percent (80%) of the actual operating pressure in effect immediately prior to the Failure on November 29, 2016, in accordance with Item 4 below.

4. **Operating Pressure Restriction.** Enterprise must reduce and maintain a twenty percent (20%) pressure reduction in the actual operating pressure on the *Affected Segment*, such that the operating pressure will not exceed eighty percent (80%) of the actual operating pressure in effect immediately prior to the Failure on November 29, 2016.
  - a. This pressure restriction is to remain in effect until written approval to increase the pressure or return the pipeline to its pre-failure operating pressure is obtained from the Director.
  - b. Prior to resuming operation, Enterprise must provide the Director with the actual operating pressures of each pump/compressor station and each main line pressure regulating station on the *Affected Segment* at the time of failure and the reduced pressure restriction set-points at these same locations. Since portions of the *Affected Segment* are capable of bi-directional operation, the reduced pressure pump station set-points should be specified for both directions of flow where applicable.
  - c. This pressure restriction requires any relevant remote or local alarm limits, software programming set-points or control points, and mechanical over-pressure devices to be adjusted accordingly.
  - d. When determining the pressure restriction set-points, Enterprise must take into account any ILI features or anomalies present in the *Affected Segment* to provide for continued safe operation while further corrective actions are completed. A description of how any ILI features or anomalies were accounted for in the determination of pressure restriction set-points shall be provided with the information submitted per Item 4b above.
  - e. Enterprise must review the pressure restriction quarterly by analyzing the operating pressure data. Enterprise must take into account any ILI features or anomalies present in the *Affected Segment* and immediately reduce the operating pressure to maintain the safe operations of the *Affected Segment*, if warranted by the quarterly review. Enterprise must submit the results of the quarterly review to the Director. The results must include, at a minimum, the current discharge set-points (including any additional pressure reductions), and any pressure exceedance at discharge set-points.
5. **Removal of Pressure Restriction.** The Director may allow the removal or modification of the pressure restriction upon a written request from Enterprise demonstrating that restoring the pipeline to its pre-failure operating pressure is justified, based on a reliable engineering analysis showing that the pressure increase is safe considering all known defects, anomalies, and operating parameters of the pipeline.
6. **Testing of Failed Pipeline Section.** Within 45 days following receipt of this Order, Enterprise must complete mechanical and metallurgical testing and failure analysis of the failed pipe and other pipe removed, including analysis of soil samples and any foreign materials. Enterprise must complete the testing and analysis as follows:
  - a. Document the chain-of-custody when handling and transporting the failed pipe section and other evidence from the failure site.

- b. Submit the testing protocols and the selection of the testing laboratory to the Director for prior approval.
  - c. Prior to commencing the mechanical and metallurgical testing, provide the Director with the scheduled date, time, and location of the testing to allow a PHMSA representative to witness the testing.
  - d. Ensure that the testing laboratory distributes all resulting reports in their entirety (including all media), whether draft or final, to the Director at the same time as they are made available to Respondent.
7. **Remedial Work Plan (RWP).** Within 90 days following receipt of this Order, Enterprise must submit an Integrity Verification and Remedial Work Plan (RWP) for implementing continuing long-term periodic testing to the Director for approval.
- a. The Director may approve the RWP incrementally without approving the entire RWP.
  - b. Once approved by the Director, the RWP will be incorporated by reference into this Order.
  - c. The RWP must provide for the verification of the integrity of the pipeline and must address all factors known or suspected in the November 29, 2016 failure, including, but not limited to the following:
    1. The integration of the results of the failure analyses and other 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, all historical repair information, construction, operating, maintenance, testing, metallurgical analysis, and other third-party consultation information, and assessment data for the *Affected Segment*. Pre-existing assessment data includes, but is not limited to, ILI tool runs, hydrostatic pressure testing, direct assessments, close interval surveys, and electrical gradient surveys. Data gathering activities must include a review of the failure history of the pipeline (including in-service and pressure test failures) and development of a written report to the Director containing all available information regarding locations, dates, and causes of leaks and failures. Additionally, the written report shall include a current integrity evaluation for the *Affected Segment*, including pre-existing ILI features, anomalies, assessment results, and status of remedial actions.
    2. The performance of additional field testing, inspections, and evaluations to determine whether and to what extent the conditions associated with the failures, or any other integrity-threatening conditions, are present elsewhere on the *Affected Segment*. At a minimum, the inspections and evaluations must consider use of in-line inspection that can reliably detect and identify anomalies. Include a detailed description of the criteria to be used for the evaluation and prioritization of any integrity threats and anomalies that are identified (accounting for uncertainties in anomaly and defect sizing by the ILI vendor and field non-destructive examination), establishing a minimum 1.39 x MOP factor of safety upon completion of testing, inspections,

evaluations, replacements and repairs as described in this Order.

3. The performance of repairs or other corrective measures that fully remediate the conditions associated with the pipeline failures and any other integrity-threatening condition along the *Affected Segment*. At a minimum, the plans shall be based on the known history and condition of the pipeline, and must consider the use of confirmatory hydrostatic testing of the *Affected Segment*. Include a detailed description of the criteria and methods to be used in undertaking any repairs, replacements, or other remedial actions to establish a minimum 1.39 x MOP factor of safety.
8. **Root Cause Failure Analysis.** Within 180 days following receipt of this Order, Enterprise must complete a root cause failure analysis (RCFA) and submit a final report of this RCFA to the Director. The final report must include findings and any lessons learned and whether the findings and any lessons learned are applicable to other locations within Enterprise's pipeline system.
9. **Order Revisions.** Upon approval by the Director, the RWP becomes incorporated into this Order and shall be revised as necessary to incorporate the results of actions undertaken pursuant to this Order and whenever necessary to incorporate new information obtained during the failure investigations and remedial activities. Enterprise must submit any such plan revisions to the Director for prior approval. The Director may approve plan elements incrementally.
10. **Implementation of Approved Work Plan.** Enterprise must implement the work plan as approved by the Director, including any revisions to the plan.
11. **Quarterly Reports.** Enterprise must submit quarterly reports to the Director that:
  - a. Include all available data and results of the testing and evaluations required by this Order; and
  - b. Describe the progress of the repairs or other remedial actions being undertaken. The first quarterly report covering the period from December 2, 2016 through March 31, 2016, shall be due by April 15, 2017.

The Director may grant an extension of time for compliance with any of the terms of this Order upon a written request timely submitted demonstrating good cause for an extension.

With respect to each submission that under this Order requires the approval of the Director, the Director may: (a) approve, in whole or part, the submission; (b) approve the submission on specified conditions; (c) modify the submission to cure any deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondent modify the submission; or (e) any combination of the above. In the event of approval, approval upon conditions, or modification by the Director, Respondent will 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 the submission, Respondent will correct all deficiencies within the time specified by the Director, and resubmit it for approval. If a resubmitted item is disapproved in whole or in part, the Director may again require Respondent to correct the deficiencies in accordance with the foregoing procedure, and

the Director may otherwise proceed to enforce the terms of this Order.

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).

In your correspondence on this matter, please refer to "CPF No. 3-2016-5010H" and for each document you submit, please provide a copy in electronic format whenever possible. 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. Parts 190 through 199, under any other order issued to Respondent under authority of 49 U.S.C. Chapter 601, 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.

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.

The terms and conditions of this Order are effective upon service in accordance with 49 C.F.R. § 190.5.

December 6, 2016

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Alan K. Mayberry  
Acting Associate Administrator  
for Pipeline Safety

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Date Issued

**§190.233 Corrective action orders.**

(a) *Generally.* Except as provided by paragraph (b) of this section, if the Associate Administrator finds, after reasonable notice and opportunity for hearing in accord with paragraph (c) of this section, a particular pipeline facility is or would be hazardous to life, property, or the environment, the Associate Administrator may issue an order pursuant to this section requiring the operator of the facility to take corrective action. Corrective action may include suspended or restricted use of the facility, physical inspection, testing, repair, replacement, or other appropriate action.

(b) *Waiver of notice and expedited review.* The Associate Administrator may waive the requirement for notice and opportunity for hearing under paragraph (a) of this section before issuing an order whenever the Associate Administrator determines that the failure to do so would result in the likelihood of serious harm to life, property, or the environment. When an order is issued under this paragraph, a respondent that contests the order may obtain expedited review of the order either by answering in writing to the order within 10 days of receipt or requesting a hearing under §190.211 to be held as soon as practicable in accordance with paragraph (c)(2) of this section. For purposes of this section, the term “expedited review” is defined as the process for making a prompt determination of whether the order should remain in effect or be amended or terminated. The expedited review of an order issued under this paragraph will be complete upon issuance of such determination.

(c) *Notice and hearing:*

(1) Written notice that OPS intends to issue an order under this section will be served upon the owner or operator of an alleged hazardous facility in accordance with §190.5. The notice must allege the existence of a hazardous facility and state the facts and circumstances supporting the issuance of a corrective action order. The notice must provide the owner or operator with an opportunity to respond within 10 days of receipt.

(2) An owner or operator that elects to exercise its opportunity for a hearing under this section must notify the Associate Administrator of that election in writing within 10 days of receipt of the notice provided under paragraph (c)(1) of this section, or the order under paragraph (b) of this section when applicable. The absence of such written notification waives an owner or operator's opportunity for a hearing.

(3) At any time after issuance of a notice or order under this section, the respondent may request a copy of the case file as set forth in §190.209.

(4) A hearing under this section is conducted pursuant to §190.211. The hearing should be held within 15 days of receipt of the respondent's request for a hearing.

(5) After conclusion of a hearing under this section, the Presiding Official submits a recommended decision to the Associate Administrator as to whether or not the facility is or

would be hazardous to life, property, or the environment, and if necessary, requiring expeditious corrective action. If a notice or order is contested in writing without a hearing, an attorney from the Office of Chief Counsel prepares the recommended decision. The recommended decision should be submitted to the Associate Administrator within five business days after conclusion of the hearing or after receipt of the respondent's written objection if no hearing is held. Upon receipt of the recommendation, the Associate Administrator will proceed in accordance with paragraphs (d) through (h) of this section. If the Associate Administrator finds the facility is or would be hazardous to life, property, or the environment, the Associate Administrator issues a corrective action order in accordance with this section, or confirms (or amends) the corrective action order issued under paragraph (b) of this section. If the Associate Administrator does not find the facility is or would be hazardous to life, property, or the environment, the Associate Administrator withdraws the notice or terminates the order issued under paragraph (b) of this section, and promptly notifies the operator in writing by service as prescribed in §190.5.

(d) The Associate Administrator may find a pipeline facility to be hazardous under paragraph (a) of this section:

(1) If under the facts and circumstances the Associate Administrator determines the particular facility is hazardous to life, property, or the environment; or

(2) If the pipeline facility or a component thereof has been constructed or operated with any equipment, material, or technique which the Associate Administrator determines is hazardous to life, property, or the environment, unless the operator involved demonstrates to the satisfaction of the Associate Administrator that, under the particular facts and circumstances involved, such equipment, material, or technique is not hazardous.

(e) In making a determination under paragraph (d) of this section, the Associate Administrator shall consider, if relevant:

(1) The characteristics of the pipe and other equipment used in the pipeline facility involved, including its age, manufacturer, physical properties (including its resistance to corrosion and deterioration), and the method of its manufacture, construction or assembly;

(2) The nature of the materials transported by such facility (including their corrosive and deteriorative qualities), the sequence in which such materials are transported, and the pressure required for such transportation;

(3) The characteristics of the geographical areas in which the pipeline facility is located, in particular the climatic and geologic conditions (including soil characteristics) associated with such areas, and the population density and population and growth patterns of such areas;

(4) Any recommendation of the National Transportation Safety Board issued in connection with any investigation conducted by the Board; and

- (5) Such other factors as the Associate Administrator may consider appropriate.
- (f) A corrective action order shall contain the following information:
- (1) A finding that the pipeline facility is or would be hazardous to life, property, or the environment.
  - (2) The relevant facts which form the basis of that finding.
  - (3) The legal basis for the order.
  - (4) The nature and description of any particular corrective action required of the respondent.
  - (5) The date by which the required corrective action must be taken or completed and, where appropriate, the duration of the order.
  - (6) If the opportunity for a hearing was waived pursuant to paragraph (b) of this section, a statement that an opportunity for a hearing will be available at a particular time and location after issuance of the order.
- (g) The Associate Administrator will terminate a corrective action order whenever the Associate Administrator determines that the facility is no longer hazardous to life, property, or the environment. If appropriate, however, a notice of probable violation may be issued under §190.207.
- (h) At any time after a corrective action order issued under this section has become effective, the Associate Administrator may request the Attorney General to bring an action for appropriate relief in accordance with §190.235.
- (i) Upon petition by the Attorney General, the District Courts of the United States shall have jurisdiction to enforce orders issued under this section by appropriate means.

[70 FR 11138, Mar. 8, 2005, as amended by Amdt. 190-16, 78 FR 58912, Sept. 25, 2013]