

**TRANSMITTED VIA EMAIL &
CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

March 13, 2014

Mr. Tom Barrett
President
Alyeska Pipeline Service Company
3700 Center Point Drive
Anchorage, AK 99503

CPF 5-2014-5003S

Dear Mr. Barrett:

Enclosed is a Notice of Proposed Safety Order (Notice) issued in the above-referenced case. The Notice proposes that you take certain measures with respect to the Trans-Alaska Pipeline System (TAPS) operated by Alyeska Pipeline Service Company (Alyeska) to ensure pipeline safety. Options for responding are set forth in this Notice. Your receipt of the Notice constitutes service of this document under 49 C.F.R. §190.5.

We look forward to a successful resolution of this matter to ensure pipeline safety. Please direct any questions on this matter to me at 720-963-3160.

Sincerely,

Chris Hoidal
Director, Western Region
Pipeline and Hazardous Materials Safety Administration

Enclosure: Notice of Proposed Safety Order
Copy of 49 CFR § 190.239

cc: Mr. Mike Joynor, Vice President, Operations, Alyeska Pipeline Service Company

**DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
OFFICE OF PIPELINE SAFETY
WESTERN REGION
LAKEWOOD, COLORADO**

_____)	
In the Matter of)	
)	
Alyeska Pipeline Service Company,)	CPF 5-2014-5003S
)	
Respondent)	
_____)	

NOTICE OF PROPOSED SAFETY ORDER

Background and Purpose

Pursuant to Chapter 601 of title 49, United States Code, the Pipeline and Hazardous Materials Safety Administration (PHMSA) has initiated an investigation into the safety of the Trans-Alaska Pipeline System (TAPS) operated by Alyeska Pipeline Service Company (Alyeska) as a result of a situation that was discovered on September 8, 2013. On that day, during scheduled valve maintenance, Alyeska discovered a large piece of metal in one of the mainline backpressure control valves at the Valdez Marine Terminal (VMT). The piece of metal was identified as a 10” diameter section of the mainline pipe wall (coupon). The coupon had a 2” vent pipe and Thread-O-Ring (TOR) attached to it. The coupon was traced back to its point of origin at Mile Post (MP) 385.77 using physical identifiers and recent in-line inspection (ILI) results. A high point vent encapsulation had been installed at this location on August 13, 2012.

PHMSA and other members of the Joint Pipeline Office (JPO) observed and/or evaluated the actions taken by Alyeska to restore the integrity at MP 385.77, investigate the cause of the pipe wall failure, simulate the failure, and assess the condition of the other encapsulations that utilized epoxy filler (approximately 90) on TAPS. The encapsulations were installed between 2010 and 2013. Despite significant field testing to date, PHMSA believes Alyeska still has not fully addressed the integrity conditions at all of the other encapsulation sites. Alyeska proposed a plan to address many of our remaining integrity concerns through additional field testing on January 31, 2014, but that testing cannot be accomplished until weather and site conditions improve. As a result of the investigations to date, it appears that a condition or conditions exist on your pipeline facilities that pose a pipeline integrity risk to public safety, property or the environment. Pursuant to 49 U.S.C. § 60117(l), PHMSA issues this Notice of

Proposed Safety Order, notifying you of the preliminary findings of the investigation, and proposing that you take measures to ensure that the public, property, and the environment are protected from the potential risk.

Preliminary Findings

- Alyeska owns and operates the TAPS, which consists of approximately 800 miles of pipeline. The pipeline transports crude oil from the North Slope of Alaska to the VMT. The pipeline is constructed with approximately 400 miles of above-ground (supported/insulated) pipe and 400 miles of buried pipe. The failure location is approximately 70 pipeline miles north of Fairbanks, Alaska, and was in an above-ground segment of the pipeline.
- The coupon was discovered on September 8, 2013. There was no discharge of oil as a result of the failure. Alyeska continued to operate TAPS and maintained steady operating pressure at the failure site throughout the entire incident.
- An in-line inspection (ILI) of TAPS between Pump Station 4 (PS4) and the VMT was conducted in the spring of 2013.
- Using physical identifiers and ILI data from the Spring 2013 pig run, Alyeska traced the origin of the 10” coupon to a construction-era high point vent at MP 385.77, approximately 70 miles north of Fairbanks. The vent had been encapsulated on August 13, 2012, to mitigate a potential integrity risk. The encapsulation was a 10” cap filled with epoxy.
- Alyeska performed visual monitoring and ultrasonic testing (UT) at MP 385.77. No abnormal conditions were observed at the site. A UT survey of the area of the 10” encapsulation was conducted to determine the remaining mainline material under the encapsulation and to examine the welds that bond the encapsulation to the mainline pipe.
- The circumference of the hole in the mainline pipe wall extended under the wall of the encapsulation, and potentially under the fillet weld that held the encapsulation to the carrier pipe. In one area the circumference of the hole was approximately 0.140 inches from the toe of the fillet weld. After evaluating the available information, Alyeska stated that there was no imminent threat of leakage or rupture while continuing to run in a steady state condition. Nevertheless, PHMSA considered the long term integrity of the existing encapsulation to be at risk.
- Alyeska completed installation of a full-encirclement, pressure-containing sleeve (a 48” split tee and 24” cap and flange) at MP 385.77 on September 14, 2013. The sleeve was installed according to Alyeska’s sleeve installation procedures. PHMSA and the Joint Pipeline Office (JPO) required Alyeska to take extensive

precautions during installation in order to avoid imposing lateral loads to the damaged encapsulation.

- In 2009, Alyeska identified a number of high-point vents and low-point drains on TAPS for risk remediation by encapsulation. In 2010, Alyeska completed the first five encapsulations. From 2011 to 2013, Alyeska continued to encapsulate the remaining vents and drains, and used a procedure that included filling the encapsulation with epoxy to mitigate the potential for deadleg piping. The five encapsulations that were completed in 2010 did not include the use of epoxy. The encapsulation diameter sizes are 6 inches (at approximately 85 locations), 10 inches (at 4 locations, including the failure site at MP 385), and 12 inches (at 1 location).
- After the discovery of the coupon at VMT, Alyeska conducted onsite radiographic and magnetic particle examinations on three (3) 10", one (1) 12", and eleven (11) 6" diameter encapsulations. Of the eleven (11) 6" encapsulations examined, six (6) encapsulations were installed after the Spring 2013 ILI run, one encapsulation was installed prior to the Spring 2013 ILI run, and four (4) encapsulations were installed on a pipeline sleeve, near the Steele Creek area. Initially, no UT (straight beam, shear wave, or phased array) of these sites was done to assess the weld or carrier pipe where the encapsulations were mounted.
- PHMSA staff verbally expressed concern to Alyeska's compliance staff regarding the need to evaluate the condition of other encapsulations on September 10, 2013. Following receipt of Alyeska's *DRAFT: Prioritization and Possible Non-Destructive Testing Techniques of Epoxy-Filled Encapsulations* (prepared by Kiefner & Associates) on October 11, 2013, PHMSA requested that Alyeska perform UT on the four remaining exposed (at the time) 10" and 12" encapsulations, and a sampling of the other encapsulations, to determine whether or not cracks existed within the encapsulations. Alyeska agreed to conduct phased array and shear wave UT of one (1) 10" encapsulation at MP 361.45 on October 17, 2013 and completed that testing on October 19, 2013. The other 10" and 12" encapsulations were not tested and the below ground encapsulations were reburied.
- On September 19, 2013, Alyeska conducted a mock-up demonstration of the methods used to install epoxy filled encapsulations covering high-point vents. The purpose of the mock-up was two-fold: (1) to screen for field investigation prioritization of which encapsulations to examine, and (2) to validate the nondestructive testing procedure. The mock-up consisted of an open-ended segment of 48" pipe with two 2" piping attachments welded to the pipe segment. The 2" attachments simulated the existing vents on TAPS. Two sizes of encapsulations were welded over the top of the 2" attachments: a 6" cap and a 10" cap. The mock-up was constructed using piping components designed, fabricated, and tested similarly to those used to install the encapsulations on the mainline from 2011 through 2013. The procedure used on the mock-ups was not identical to the procedure used in the original mainline pipeline encapsulations. Approximately

3½ hours after the initial epoxy pour into the 10” encapsulation, the 48” pipe wall contained within the internal circumference of the 10” encapsulation bulged and then failed during the curing process. The failure resulted in the pipe wall material (approximately 10” in diameter) and epoxy being injected into the 48” pipe. The explosion of the mainline failure within the mock-up’s 10” encapsulation resulted in a safety incident at the lab where the test was performed, which Alyeska investigated. Alyeska provided a report of the safety incident to PHMSA.

- The 10” coupon found at the VMT was sent to Kiefner and Associates for analysis. On November 22, 2013, Kiefner and Associates submitted their report to Alyeska titled “*Examination of a Failed Pipe Coupon from an Epoxy-filled Encapsulation at MP-385 on the Trans-Alaska Pipeline.*” Kiefner’s report concluded that, “The coupon of carrier pipe was separated within the base of the encapsulation due to high pressure condition inside the encapsulation...” and “... High pressure within the encapsulation is plausible given that the ventilation fitting in the top of the encapsulation was plugged with cured epoxy.”
- Alyeska sent its Pipeline MP 385.77 Incident Investigation Report to PHMSA on November 22, 2013. Alyeska’s Investigation Report (Page 3 of 29) concluded that the epoxy created a mechanism which caused the “punch-out” of the pipe coupon. The report also stated that a small amount of oil leaked from the encapsulation during the installation.¹
- Alyeska conducted an analysis of the Spring 2013 ILI data at each of the high point vent and low point drain locations. This analysis is described in a report titled “*ILI Encapsulation Analysis Report Regarding PLMP 385.77 Incident*” dated November 6, 2013. The report concluded that the ILI data “confirmed that no locations other than PLMP 385.77 showed indications of a loss of pipe wall material.”
- Six (6) encapsulations (one (1) each at MP 548.59, 586.68, 585.84, and 585.87, and two (2) at MP 548.80) were installed after the Spring 2013 ILI was conducted. Therefore, no current ILI information is available for these six vent/drain locations after installation.
- Alyeska concluded that the 10” coupon dislodgement at MP 385.77 was due to a high pressure condition inside of the encapsulation and that the epoxy injected into the encapsulation created a mechanism for generating the high pressure. There are

¹ Alyeska’s crew welded the encapsulation over the TOR high-point vent, injected epoxy, and then: “The crew inserted clear vinyl tubing into the pipe with a plastic bag attached at the lower end to catch any epoxy that might escape the spool due to expansion as the epoxy cured. When the crews returned to MP-385.77 on the morning of 08/14/12, they found crude oil had leaked from the ½” Thread-O-Let (TOL) fitting at the top of the encapsulation, entered the vinyl tubing with about ½ cup in the plastic bag, and some oil had escaped to run down the pipe with a few drops to the ground below. They immediately notified the Alyeska construction manager, HCC management, and filed a spill report (LI#21563). The threaded pipe used to catch expanding epoxy was removed and the ½” plug was installed.”

a number of other vent/drain locations (approximately 90) that were installed in the 2011-2013 timeframe using epoxy to fill the encapsulation. The conditions of the other encapsulations are unknown in the following areas: 1) cracking of the carrier pipe below the encapsulation, 2) internal pressure in the encapsulation either as a result of the epoxy curing process or crude oil leakage, and 3) integrity of encapsulation body and weld integrity. Occurrence of any or all of these items may pose a risk of a leak or carrier pipe failure.

- PHMSA sent a Request for Specific Information (RFSI) to Alyeska on September 19, 2013. Alyeska responded on November 7, 2013, and provided most of the requested items. PHMSA reviewed the information and sent an email on December 16, 2013, documenting items that had been requested in the RFSI that Alyeska had not yet provided. Alyeska and PHMSA met on January 23, 2013 to discuss the outstanding items. The outstanding items have not been provided to PHMSA.
- On December 16, 2013, the JPO provided Alyeska with a list of 37 key issues requiring further explanation or analysis, Letter No. 13-544-AAS. On January 31, 2014, Alyeska responded to the JPO request by Government Letter No. 29695. On February 7, 2014 Alyeska submitted supplemental information by Government Letter 29798. The JPO responded to Alyeska on February 14, 2014 by Letter No. 14-032-AS. Alyeska submitted supplemental information in response to JPO Letter No. 13-544-AS by Government Letter 29855 on February 28, 2014.

Proposed Issuance of Safety Order

Section 60117(l) of Title 49, United States Code, provides for the issuance of a safety order, after reasonable notice and the opportunity for a hearing, requiring corrective measures, which may include physical inspection, testing, repair, or other action, as appropriate. The basis for making the determination that a pipeline facility has a condition or conditions that pose a pipeline integrity risk to public safety, property, or the environment is set forth both in the above-referenced statute and 49 C.F.R. § 190.239, a copy of which is enclosed.

After evaluating the foregoing preliminary findings of fact and considering the age of the pipe involved, the manufacturer, the hazardous nature of the product transported and the pressure required for transporting such product, the characteristics of the geographical areas where the pipeline facility is located, the uncertainty regarding the integrity of the other encapsulations, and the likelihood that the conditions could worsen or develop on other areas of the pipeline and potentially impact its serviceability, it appears that the continued operation of the affected pipeline without corrective measures would pose a pipeline integrity risk to public safety, property, or the environment.

Accordingly, PHMSA issues this Notice of Proposed Safety Order to notify Alyeska of the proposed issuance of a safety order and to propose that it take the measures specified herein to address the potential risk.

Response to this Notice

In accordance with § 190.239, you have 30 days following receipt of this Notice to submit a written response to the official who issued the Notice. If you do not respond within 30 days, this constitutes a waiver of your right to contest this Notice and authorizes the Associate Administrator for Pipeline Safety to find facts as alleged in this Notice without further notice to you and to issue a Safety Order.

In your response, you may notify that official that you intend to comply with the terms of the Notice as proposed, or you may request that an informal consultation be scheduled (you will also have the opportunity to request an administrative hearing before a safety order is issued). Informal consultation provides you with the opportunity to explain the circumstances associated with the risk conditions alleged in the notice and, as appropriate, to present a proposal for a work plan or other remedial measures, without prejudice to your position in any subsequent hearing. If you and PHMSA agree within 30 days of informal consultation on a plan and schedule for you to address each identified risk condition, we may enter into a written consent agreement (PHMSA would then issue an administrative consent order incorporating the terms of the agreement).

If a consent agreement is not reached, or if you have elected not to request informal consultation, you may request an administrative hearing in writing within 30 days following receipt of the Notice or within 10 days following the conclusion of an informal consultation that did not result in a consent agreement, as applicable. Following a hearing, if the Associate Administrator finds the facility to have a condition that poses a pipeline integrity risk to the public, property, or the environment in accordance with §190.239, the Associate Administrator may issue a safety 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 **5-2014-5003S** and for each document you submit, please provide a copy in electronic format whenever possible.

Proposed Corrective Measures

Pursuant to 49 U.S.C. § 60117(l) and 49 C.F.R. § 190.239, PHMSA proposes to issue to Alyeska a Safety Order incorporating the following requirements with respect to the affected pipeline:

1. Develop a protocol and schedule for increased monitoring of the encapsulations. Possible monitoring methods could include installing soil gas probes at all locations

and leaving certain locations exposed. Submit monitoring protocol and implementation schedule to PHMSA for approval within 30 days of receiving this order.

2. Complete a phased array and shear wave ultrasonic testing of the three (3) remaining 10" and 12" encapsulations, and all 6" encapsulations that were installed after the Spring 2013 ILI run. Complete the field testing by July 15, 2014. If field testing at individual locations cannot be completed by July 15, 2014 due to site safety concerns, Alyeska may propose an alternate completion date with supporting justification to PHMSA. Submit the testing report (test results, analysis of the results, conclusions reached, etc.) for each individual location to PHMSA no later than 30 days after testing is completed at each location.
3. Complete a phased array and shear wave ultrasonic testing, magnetic particle examination, and radiographic examination of at least 10% of the remaining 6" encapsulations. The specific locations to be evaluated should be chosen based on specific site risk factors such as: atmospheric temperature during encapsulation installation, pipeline pressure during encapsulation installation, condition of TOR at time of encapsulation, and ILI data. Submit the list of 6" encapsulations to be examined to PHMSA for approval, including the justification of why each location was selected, within 30 days of receiving this order.
4. Complete field testing of the encapsulations identified in Item 3 and approved by PHMSA by August 15, 2014. If field testing at individual locations cannot be completed by August 15, 2014, due to safety concerns, propose an alternate completion date with supporting justification. Submit the testing report (test results, analysis of the results, conclusions reached, etc.) for each individual location to PHMSA no later than 30 days after testing is completed at each location.
5. Remediate all integrity threats identified by the testing required by items 2 and 4 above by September 30, 2014.
6. Develop a protocol and schedule to test the pressure in the encapsulations and a plan for relieving the pressure as necessary. Submit protocol and schedule to PHMSA within 30 days of receiving this order. Complete the testing and relieve the pressure, as necessary, within 1 year of receiving the order.

The above actions proposed to be required by this Notice of Proposed Safety Order are in addition to and do not waive any requirements that apply to Alyeska's pipeline system under 49 C.F.R. Parts 190 through 199, under any other order issued to Alyeska under authority of 49 U.S.C. Chapter 601, or under any other provision of Federal or State law.

After receiving and analyzing additional data in the course of this proceeding and implementation of the corrective measures, PHMSA may identify other safety measures that

need to be taken. In that event, Alyeska will be notified of any proposed additional measures and any amendments to the work plan or Safety Order.

Chris Hoidal
Director, Western Region
Pipeline and Hazardous Materials Safety Administration

Date issued

cc: PHP-60 Compliance Registry
PHP-500 T. Johnson (#144579)