

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 1, 2011

Mr. Thomas Barrett
President
Alyeska Pipeline Service Company
900 E. Benson Blvd.
P.O. Box 196660
Anchorage, AK 99519

CPF 5-2011-5001S

Dear Mr. Barrett:

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

We look forward to a successful resolution to ensure pipeline safety. Please direct any questions on this matter to Dennis Hinnah at 907-271-6517 or me at 720-963-3160.

Sincerely,

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

Enclosure: Notice of Proposed Safety Order
49 C.F.R. § 190.239

cc: Dennis Hinnah, Deputy Region Director, Western Region, PHMSA Office of
Pipeline Safety, 188 West Northern Lights Blvd., Suite 520, Anchorage, AK 99503

**DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
OFFICE OF PIPELINE SAFETY**

In the Matter of)

Alyeska Pipeline Service Company,)

Respondent)

CPF No. 5-2011-5001S

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 of the safe operation of the Trans-Alaska Pipeline System (TAPS), including the investigation of a pipeline leak at Pump Station 1 (PS-1) that began on January 8, 2011. The TAPS is operated by Alyeska Pipeline Service Company (Alyeska) and transports crude oil from the production fields in Prudhoe Bay, Alaska, to their marine transfer facilities in Valdez, Alaska.

As a result of the investigation, it appears that multiple conditions exist on your pipeline facility that pose a pipeline integrity risk to public safety, property or the environment. Pursuant to 49 U.S.C. § 60117(1), 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

- The affected pipeline is the 800-mile long, 48-inch diameter TAPS which transports crude oil from PS-1 in Prudhoe Bay, Alaska, to the Valdez Marine Terminal in Valdez, Alaska. PS-1 receives crude oil from production oil fields on the North Slope of Alaska.
- The TAPS was constructed between 1975 and 1977, and began transport of oil on June 20, 1977. During that period, average daily oil throughput increased until it peaked at 2.033 million barrels per day (bpd) in 1988. At the end of December 2010, it was averaging

between 600,000 and 700,000 bpd, and averages a throughput decline of approximately 6% per year.

- The reduced throughput has resulted in numerous integrity challenges that have not been fully addressed by Alyeska's operational and maintenance activities. Significant challenges for TAPS future operations include decreasing crude oil temperatures, water freezing due to these decreased temperatures, increased wax precipitation and deposition on the pipe wall, slack line conditions at multiple locations, and changing oil composition. Two issues in particular need to be addressed to ensure the long-term integrity of TAPS: water in the TAPS stream and deposition of crude oil solids (i.e., wax) on the pipeline wall.
 - The present pipeline specification allowing crude oil containing up to 0.35% Basic Sediment and Water (BS&W) to enter TAPS is based on an average and does not prevent free water and water slugs from entering the TAPS crude stream. This water can create a corrosion-susceptible environment. During a TAPS shut down in extreme cold temperatures, there is a risk of water accumulation in low points freezing and creating ice plugs which could impede restart of TAPS and damage valves, instrumentation, and other pipeline components. If flowing crude temperature drops below freezing, ice crystals may form in the crude stream, potentially adversely affecting equipment and instrumentation.
 - At lower crude temperatures, increased wax precipitation from the crude stream adheres to the pipeline wall creating a corrosion-conducive environment. Soft wax in the crude stream clogs inline inspection tool (smart pig) sensors. Increased wax from lower crude temperatures creates wax management issues during maintenance pigging.
- There is a history of both internal and external corrosion problems on pipelines upstream of PS-1. This has prompted replacement of several pipelines including the OT501 pipeline and the Oil Transit line system transporting sales oil crude from Gathering Center 2 and Flow Station 2 by the owner of those pipelines.
- In 2008, Alyeska identified several locations with internal corrosion, two locations with over 80% wall loss and three locations with over 50% wall loss, in the above ground piping in the PS-1 Tank Farm that required mitigation. Alyeska installed full encirclement metal sleeves to mitigate the wall loss. The locations that required sleeves are on piping that connects the PS-1 tanks to the suction side of the booster pumps and the meter building.
- Significant changes have been implemented on the TAPS during the last 15 years to address this reduced throughput, including taking Pump Stations 2, 6, 8, and 10, out of service (the breakout storage tanks associated with these stations were also decommissioned) and placing PS-7 and the tank at PS-12 on standby status.
- The U.S. Environmental Protection Agency notified the Director, Western Region, PHMSA (Director), of the leak on Saturday, January 8, 2011. Shortly after this notification, Alyeska reported the spill and subsequent shutdown of the pipeline system to PHMSA. Alyeska reported the leak to the National Response Center (NRC) (incident report # 964075).
- The area around PS-1 has been deemed a High Consequence Area per 49 CFR Part 195.

- The leak appears to be located in the below-ground station piping and headers between the PS-1 booster pumps and the mainline pumps. The pipe was manufactured and installed in the 1970s and encased in concrete in the early 1990s.
- The leak occurred in piping connected to or in low-flow, dead leg piping. Such locations are susceptible to corrosion because they cannot be cleaned with cleaning pigs and because sediment accumulates and prevents corrosion inhibitors and biocides from reaching the pipe wall. TAPS has other locations within PS-1 and other facilities where low flow and dead leg piping exists. Dead legs in underground piping cannot be assessed by smart pigs (ILI) or external ultrasonic transducer (UT) testing measurements.
- The failed pipe has not yet been excavated to determine the cause of the leak; however it is believed to be the result of external or internal corrosion. Internal sampling of fluids and internal pipe wall sediment and materials occurred on January 21, 2011, and testing is underway by Alyeska contractors.
- After the leak was discovered, it took approximately ten (10) days for temporary above-ground bypass piping at PS-1 to be constructed to allow TAPS to return to full service and to seal off the leaking pipe. The bypass piping began service on January 17, 2011.
- The minimum pipeline oil temperature recorded at a TAPS pump station during the shutdown as reported by Alyeska was 25.7 degrees Fahrenheit.
- Since this pipeline was encased in concrete, the exact leak site could not be easily identified or be repaired before TAPS would need to be restarted due to the lack of sufficient storage at PS-1 and the cold temperature conditions. To prevent potential freezing conditions on the remaining portions of TAPS, which could have caused additional pipeline damage and leaks, Alyeska operated the pipeline with containment and recovery from January 11, 2011, to January 15, 2011, while repairs were ongoing.
- Alyeska has a Cold Restart Plan that was created as early as 2001 to address the possibility of needing to restart the pipeline after a prolonged shutdown of TAPS during cold temperature conditions. This plan was revised in December 2005 and further revised in December 2010. Alyeska indicated that this Cold Restart Plan had never been used in operation or tested under cold weather conditions. Alyeska did indicate that the equipment and piping was deployed in 2006 during a response plan exercise according to the version of the Plan that was in place at the time.
- During the leak at PS-1, Alyeska had difficulty implementing the latest version of the Cold Restart procedures, partially due to the inability to quickly move equipment to the necessary locations along the pipeline. In addition, the Cold Restart Plan required that certain regulatory requirements be disregarded in order to be implemented.
- At the current flow rate through TAPS, Alyeska has two cleaning pigs in the pipeline at any given time. A cleaning pig could cause a plug in the pipeline if the line is shut down and there is a need to implement the Cold Restart Plan. Two scraper cleaning pigs were in transit when the pipeline was shutdown as a result of the leak. One was near MP 424 and the other was close to the southern end of TAPS. The only permanent pig receiver that could have

been used to remove the pigs from the pipeline was located at the Valdez Marine Terminal. At the current average rate of 630,000 bpd, it takes approximately two weeks for a cleaning pig to transverse the pipeline from PS-1 to Valdez. As throughput in TAPS changes, the number of pigs in the pipeline at any given time may need to be increased.

- If tank storage at PS-1 reaches capacity when TAPS is shut down, production on the North Slope must be halted, which can cause damage to the production facilities upstream from PS-1. At the current approximate production rate of 630,000 bpd, tank storage at PS-1 is filled to capacity in about half a day. If production is prorated to 5% of the current approximate production rate of 630,000 bpd, tank storage at PS-1 is filled to capacity in about 10 days.
- To prevent tank storage at PS-1 from reaching full capacity, the North Slope production rate was adjusted throughout the incident, based upon the changing situation, from the time the leak was discovered on January 8, 2011, until the bypass was completed on January 17, 2011. Production was prorated to as low as 5% for several days.
- Based on these preliminary findings, the alleged risk conditions on TAPS that pose a pipeline integrity risk are:
 - 1) The loss of system integrity that resulted in a hazardous liquid leak at PS-1. The location of the leak could not be assessed because it is not accessible by smart pigs (ILI) or external UT measurements. Other buried station piping and buried deadlegs exist on other portions of TAPS and they similarly cannot be assessed to ensure that there are no pipe integrity threats.
 - 2) The inability to capture or launch cleaning or inline inspection (ILI) devices at interim locations between Pump Station 4 and Valdez Marine Terminal despite the fact that this is where the coldest operating conditions exist and the potential for waxing and freezing is higher than on other portions of TAPS.
 - 3) The feasibility of and the time it takes to implement the Cold Restart Plan.
 - 4) The lack of sufficient storage facilities at key locations along the pipeline, particularly immediately upstream of PS1, causes integrity challenges during TAPS shutdowns or lengthy production prorations and increases the risk of an additional release during cold weather, thus making prompt response and repair essential.

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 undetermined cause of the pipeline leak, the age of the pipe involved, the method of construction, including encasement, the inability of Alyeska to perform internal inspections or external UT measurements of piping, the inability to capture or launch cleaning or ILI devices at interim locations, the feasibility of and the time it takes to implement the Cold Restart Plan, the lack of sufficient storage facilities at PS-1 and other key locations, the hazardous nature of the product transported, the pressure required for

transporting such product, the characteristics of the geographical areas where the pipeline facility is located, 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 Respondent of the proposed issuance of a safety order and to propose that Respondent take 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. 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 **5-2011-5001S** 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 a safety order to Alyeska requiring the following:

1. Submit to PHMSA by February 15, 2011, a written plan for a third-party investigation of the leak site at PS-1 that will include conducting appropriate tests, analyses, and evaluations to establish the probable cause of the leak. The Director must approve the selection of the third party contractor. The investigation plan must include collecting samples of sediments, deposits, bacteria, and preserving the pipe for forensic analysis. Ship any removed samples and the removed pipe to a laboratory approved by PHMSA for analysis. Complete the work required by this plan, including the third party analysis regarding leak cause, and provide the results to PHMSA by July 1, 2011.
2. Replace any piping along TAPS that cannot be assessed using ILI tools or other assessment technologies as approved by the Director which upon failure would interrupt the safe operation of TAPS. The safe operation of TAPS requires that there be no extended shutdown of TAPS that would put other portions of the pipeline at risk due to reduced flow or low temperatures. Submit for approval by the Director a listing of such piping being replaced and a written plan and timeline for replacement by June 15, 2011.
3. Submit an assessment of the need for additional permanent pig launchers and receivers, taking into account the anticipated continued reduction in TAPS throughput. Submit for approval by the Director a recommendation from a third-party regarding the need for additional permanent pig launchers and receivers and a plan for installing the additional recommended equipment by May 15, 2011.
4. Submit a written plan and proposed timeline for installing at least one additional permanent pig launcher and permanent pig receiver between PS-5 and PS-10 for approval by May 15, 2011, and complete installation according to the approved timeline. This launcher and receiver must be equipped to handle both routine maintenance pigs and ILI tools.
5. Perform a documented evaluation of the need for increased tank capacity at pump stations to assist during prolonged outages and the implementation of a cold restart, submit this written documented evaluation to PHMSA by September 30, 2011, and complete any identified increase in tank capacity by September 30, 2012. Alyeska will use best efforts to perform project actions, and obtain necessary regulatory approvals.
6. Pre-position all Cold Restart Equipment at the facility where it would need to be utilized, according to the company's current version of the Cold Restart Plan, immediately. The cold restart equipment should be assembled and protected so that the time to implement cold restart is minimized.
 - a. Apply for the applicable regulatory permits and request expedited consideration by March 15, 2011.
 - b. Demonstrate to the Director that all equipment is configured onsite and Cold Restart can be implemented in less than 72 hours within 7 days of receipt of regulatory permits.
7. Submit to PHMSA a revised "Cold Restart Plan" to address the possibility of a prolonged shutdown of the pipeline by July 15, 2011.
 - a. Utilize lessons learned and data collected during the January 2011 incident and any other research or lessons learned to date to support revisions to the Cold Restart plan.

- b. Ensure that all key pressure transducers at Remote Gate Valves 36, 65, 98, and 121 remain functioning at all times, including during freezing conditions and restricted or reduced flow.
 - c. Pre-position all cold restart equipment according to the revised Cold Restart Plan and provide predesignated flange connection points for all cold restart equipment by October 31 of each year. This equipment and connection points are to remain in place through May 1 of the following year.
 - d. Conduct an engineering review of all restart components to ensure they meet the PHMSA pipeline safety regulations. Submit this engineering review to PHMSA for review by August 1, 2011.
8. Demonstrate to the Director the implementation and operational status of the revised Cold Restart Plan equipment, but not the engines, by August 31, 2011. Tying the engines into the Cold Restart equipment and demonstrating their operational status will occur within 7 days of receipt of regulatory permits.
9. Submit quarterly reports to the Director and Deputy Region Director that: (1) include available data and results of the testing and evaluations required by the safety order; and (2) describe the progress of the repairs and other remedial actions being undertaken to comply with the safety order.
10. The Director or Deputy Region Director may grant an extension of time for compliance with any of the terms of the safety order upon a written request timely submitted demonstrating good cause for an extension.
11. Respondent may appeal any decision of the Director or Deputy Region Director to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.
12. It is requested that Alyeska maintain documentation of the safety improvement costs associated with fulfilling this Safety Order and report such costs in its quarterly reports as required in item 8. It is requested that these costs be reported in two categories:
 - a. Total cost associated with preparation/revision of plans, procedures, studies, and analyses, and
 - b. Total cost associated with replacements, additions, and other changes to pipeline infrastructure.
13. Submit information, reports, and notifications required by this safety order to:
 - a. Director, Western Region, PHMSA Office of Pipeline Safety, 12300 West Dakota Avenue, Suite 110, Lakewood, CO 80228, and
 - b. Deputy Region Director, Western Region, PHMSA Office of Pipeline Safety, 188 West Northern Lights Blvd., Suite 520, Anchorage, AK 99503.

The actions proposed by this Notice of Proposed Safety 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. § 60101 et seq., 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 work plan, PHMSA may identify other safety measures that need to be taken. In that event, Respondent will be notified of any proposed additional measures and, if necessary, amendments to the work plan or safety order.

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

Date issued