



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety Administration**

400 Seventh Street, S.W.  
Washington, D.C. 20590

JUL 20 2006

**Via Federal Express and Facsimile To: (907) 564-5000**

Ms. Maureen L. Johnson  
Senior Vice President & Greater  
Prudhoe Bay Performance Unit Leader  
BP Exploration (Alaska), Inc.  
P.O. Box 196612  
Anchorage, AK 99519-6612

**RE: CPF #5-2006-5015H  
Amendment No.1 to Corrective Action Order**

Dear Ms. Johnson:

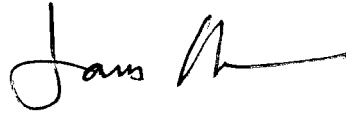
Enclosed is Amendment No. 1 to the March 15, 2006 Corrective Action Order (CAO) issued by the Associate Administrator for Pipeline Safety to BP (Alaska) Inc. (BP). Amendment No. 1 requires you to take additional actions based on the results of our continuing investigation into the failure on BP's pipeline discovered March 2, 2006.

It has been and remains BP's continuing responsibility to complete all of the actions required by the March 15 CAO, including all maintenance and smart pigging operations on each of the specified lines. BP is obligated to explore all available options for overcoming any engineering issues that might complicate or delay those operations and put in place appropriate contingency plans. Based on additional information and in light of the current state of the pipeline system, we are setting forth additional requirements to assess readiness for internal inspection and to plan for measures to execute our order in a safe manner that will minimize risk to Trans Alaska Pipeline System (TAPS). The additional requirements include removing the crude oil in the section of the Prudhoe Bay Western Operating Area Oil pipeline that is now idle, and enhanced measures to monitor and handle the sediments from the pipelines. Amendment No. 1 does not waive, alter or supplant the original terms and requirements of the March 15 CAO, including the deadlines imposed by Items 3, 4 and 7.

PHMSA will issue a separate amendment (Amendment No. 2) to address additional integrity requirements.

Your receipt of the enclosed document constitutes service of that document under 49 C.F.R. §190.5. The terms and conditions of this Amendment are effective upon receipt.

Sincerely,

A handwritten signature in black ink, appearing to read "James Reynolds". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

James Reynolds  
Pipeline Compliance Registry,  
Office of Pipeline Safety

Enclosure

cc: Chris Hoidal, P.E., Director  
Western Region  
Pipeline and Hazardous  
Material Safety Administration

**DEPARTMENT OF TRANSPORTATION  
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION  
OFFICE OF PIPELINE SAFETY  
WASHINGTON, DC 20590**

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<b>In the Matter of</b>	)	
	)	
<b>BP Exploration (Alaska) Inc.,</b>	)	<b>CPF No. 5-2006-5015H</b>
	)	
<b>BP</b>	)	
_____	)	

**AMENDMENT No.1 TO CORRECTIVE ACTION ORDER**

***Background & Purpose***

On March 15, 2006, under authority of 49 U.S.C. §60112, the Associate Administrator for Pipeline Safety, Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a Corrective Action Order (CAO) to BP Exploration (Alaska) Inc. (BP), finding that the continued operation of BP's Prudhoe Bay Western Operating Area (WOA), Eastern Operating Area (EOA) and Lisburne crude oil pipelines, would be hazardous to life, property, or the environment without the implementation of corrective measures. The CAO was issued in response to a failure on BP's WOA pipeline that caused the discharge of an estimated 201,000 gallons of crude oil on the North Slope tundra.

***Additional Preliminary Findings***

**Prudhoe Bay Transmission Pipelines (EOA, WOA, and Lisburne)**

1. BP has been on notice since at least May 2006 that cleaning of the WOA, EOA, and Lisburne pipelines could dislodge sediments and solids that had accumulated in the pipelines over a period of years.
2. In 1992, BP's predecessor suspended cleaning of the EOA oil transmission pipeline when residues, waxes, and calcium carbonate deposits clogged the strainers maintained by Alyeska Pipeline Service Company (Alyeska) at Pump Station-1 on the Trans Alaska Pipeline System (TAPS). The calcium carbonate was primarily encountered between Flow Station-3 and Skid 50.

3. In May 2006, BP performed gamma ray scans to determine the volume of sludge inside the EOA and WOA oil transmission pipelines. BP advised PHMSA that sediment levels in some areas in the EOA oil transmission pipeline were in the range of 9 to 12 inches.
4. On May 22, 2006, PHMSA received a copy of a report by Alyeska entitled *TAPS Impact Assessment of BPXA Pigging -Interim Report*. Alyeska performed this study to understand the potential risk to TAPS if the sludge volumes estimated by BP were pushed into the TAPS pipeline in the process of performing cleaning operations on the pipelines. The report concluded that the solids from the WOA and EOA pipelines could adversely impact the operations of TAPS.
5. Alyeska's analysis was based on anecdotal evidence and results from the last time the EOA and WOA pipelines were pigged, and reports of the gamma ray surveys performed by BP in May 2006.
6. In June 2006, BP informed PHMSA that it had overestimated the volume of solids detected by the May 2006 gamma ray scans and that, upon reinterpretation of the scans, it estimated average sediment levels as follows:
  - a. Lisburne pipeline: 0.4-inch from LS 1 to TAPS Pump Station-1;
  - b. EOA pipeline: 1-inch from FS2 to FS1 and 0.6-inch from FS 1 to Skid 50;
  - c. WOA pipeline: 2.8-inches from GC 2 to GC 1; 0.8-inch from GC1 to GC3, and 1.9-inches from GC3 to Skid 50;
  - d. Skid 50 to TAPS Pump Station-1: 1-inch.
7. BP began cleaning and maintenance pigging of the Lisburne pipeline on or about June 9, 2006, and ending on or about June 22, 2006. Approximately one cubic yard of sediment was removed from the Lisburne oil transmission pipeline. That amount is consistent with the predicted volume from the gamma ray scan conducted in May 2006.
8. BP inspected the Lisburne oil transmission pipeline with an instrumented in-line inspection device on or about June 30, 2006. The inspection results are still pending.
9. BP launched the first cleaning pig in the outer segment of EOA from FS-2 to FS-1 during the week of July 3, 2006. BP has advised PHMSA that these cleaning operations are ongoing.
10. Based on reported cleaning results to date, it appears that additional scale, debris or sediment may have been pushed from the 30-inch EOA segment into the 34-inch segment during these cleaning operations.
11. Strainers on TAPS Pump Station -1 meter runs have an approximately 1 barrel capacity, and a  $\frac{3}{4}$  inch mesh size.

12. BP does not currently have large volume facilities to sequester solids displaced by cleaning pigs.
13. TAPS has two 210,000 BBL storage tanks located at Pump Station-1. Beginning in August, these breakout tanks are expected to have excess capacity for the remainder of 2006.
14. BP has not reached an agreement or arrangement with Alyeska concerning handling of the solids in the WOA and EAO pipelines and has not made arrangements for capturing and removing sediments from the pipelines without the use of Alyeska facilities.

Idled OT-21 Section of WOA pipeline

15. After the failure on BP's WOA pipeline, the segment that failed extending from Gathering Center two (GC2) to Gathering Center one (GC1) and is known as the OT-21 Segment (OT-21) was idled. The approximately three-mile long OT-21 segment was not drained after it was idled and still contains crude oil. BP has not run cleaning and maintenance pigs on the OT-21 segment or on the connecting segments of WOA, as required by Items 3 and 4 of the March 15, 2006 CAO.
16. According to information provided by BP, OT-21 currently contains approximately 17,000 barrels (BBL)<sup>1</sup>
17. At this time, BP theorizes that OT-21 leaked because of "enhanced corrosion." BP's theory of this corrosion is based on the aggregate effect of several likely factors:<sup>2</sup>
  - a. Although corrosion inhibitor was injected at the production stage, none was being injected at GC2 for an extended period prior to the pipeline failure.
  - b. The OT-21 crude oil stream contained a reduced level of corrosion inhibitor.
  - c. This resulted in a corresponding decrease in the toxicity of the water in the pipeline and a corresponding increase in the bacterial activity in the pipeline.
18. PHMSA has preliminarily determined that these conditions created an environment in which extensive corrosion occurred. Although the ultimate cause of failure cannot be determined until a metallurgical analysis to determine the root cause of failure and the contents of OT-21 from the failure is analyzed, the postulated corrosive environment that existed inside OT-21 and led to the failure most likely remains in existence today and the pipeline may still be corroding OT-21, even at the current lower temperatures (40 to 50 degrees Fahrenheit) of the idled oil.
19. The stagnant environment inside OT-21, in combination with other risk factors, including the presence of water in the pipeline, poses an ongoing leak threat. In the aggregate, the

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<sup>1</sup> 1 BBL = 42 US gallons. 17,000 BBL = 714,000 gallons.

<sup>2</sup> BP's June 6, 2006 Request for Extension, Appendix G, OT-21 Leak Failure Theory and Application, 1-2.

risk factors warrant corrective action to remove the contents of OT-21 before the onset of winter weather conditions on the North Slope.

20. The oil in OT-21 will become more viscous and difficult to extract as temperatures drop. All other factors being equal, conducting the de-oiling operation before the onset of winter weather will minimize engineering complications and associated risks.

### **DETERMINATION OF NECESSITY FOR AMENDMENT OF CORRECTIVE ACTION ORDER AND RIGHT TO A 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 appropriate action. The basis for making the determination that a pipeline facility is hazardous, requiring corrective action, is set forth in the above-referenced statute and in 49 C.F.R. §190.233.

Section 60112(e) and the regulations promulgated there under (49 C.F.R. §190.233(b), 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 result in likely 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.

Based upon the preliminary and additional findings, I continue to find that the presence of hazardous conditions on the specified pipelines, including the OT-21 segment, without the implementation of corrective measures, would result in likely serious harm to life, property or the environment. BP has failed to meet its continuing responsibility to pursue all available options for meeting the requirements of Items 3, 4, and 7 of the March 15, 2006 CAO, and to address the risks associated with idling of OT-21, including simultaneous preparation of contingency plans, risk analyses, and engineering plans for alternative options and timely acquisition of necessary information and materials. The lack of sufficient progress towards completing items 3, 4, and 7 of the CAO necessitates a permanent solution that is not dependent on, and does not pose a risk to, TAPS.

Additionally, after considering the circumstances surrounding the failure discovered on March 2, 2006, the hazardous nature of the liquids remaining in OT-21, the immediate proximity of the pipeline to environmentally sensitive areas, the extensive corrosion and wall thinning found in OT-21, the potential for additional corrosion and wall thinning due to current idle conditions, the presence of water, and the safety and environmental threats posed by those conditions, I find that failure to expeditiously issue this Amendment would result in likely serious harm to property and the environment.

Accordingly, this Amendment ordering immediate corrective action is issued without prior notice and opportunity for a hearing. The terms and conditions of this Amendment are effective upon receipt.

Within 10 days of receipt of this Amendment, BP may request a hearing, to be held as soon as practicable, by notifying the Associate Administrator for Pipeline Safety in writing, delivered personally, by mail or by facsimile at (202) 366-3666. A hearing, if requested, will be held in Lakewood, CO or Washington, DC on a date that is mutually convenient to PHMSA and BP. A hearing requested on this Amendment may be consolidated with the hearing BP has already requested on this CAO.

In the course of this investigation, PHMSA has identified and may identify additional measures that need to be taken to ensure the safety of BP's pipelines covered by the CAO. Such measures will be embodied in subsequent amendment(s) to the March 15, 2006, CAO and will impose additional requirements pending BP's completion of cleaning and smart pigging operations required by the March 15, 2006 CAO. The terms of the March 15, 2006 CAO and the additional terms added by this Amendment and subsequent amendment(s) will remain in place for as long as the Associate Administrator deems necessary to ensure that the specified pipelines are operated in a safe and environmentally sound manner.

#### **AMENDMENTS TO REQUIRED CORRECTIVE ACTION**

Pursuant to 49 U.S.C. §60112, I hereby order BP to immediately take the following additional corrective actions with respect to BP's Prudhoe Bay oil transmission pipeline system:

The following items are added to the Corrective Action Order:

**Item 11.** Within fourteen (14) days from receipt of this Amendment No. 1, BP shall conduct and provide to PHMSA additional gamma ray scans of the EOA 34-inch (FS-1 to Skid 50) segment, at the same locations scanned with gamma ray technology in May 2006. BP shall conduct the gamma ray scans in a manner sufficient to ensure that the results are accurate and representative of the sediment loads throughout the EOA 34-inch segment of the oil transmission pipeline. Following each successive run, BP shall provide PHMSA an estimate of the volume of sediment removed and supporting field data for that estimate.

**Item 12.** At least 30 days prior to beginning cleaning operations on any segment of the WOA oil transmission pipeline, BP shall conduct and provide to PHMSA gamma ray scans at all elevation change locations on those segments. BP shall conduct the gamma ray scans in a manner and at locations sufficient to ensure that the results are accurate and representative of the sediment loads throughout the inspected segments. Following each successive run, BP shall provide PHMSA an estimate of the volume of sediment removed and supporting field data for that estimate. BP shall complete all requirements of the March 15 CAO with respect to all segments of the WOA, EOA, and Lisburne pipelines that BP is operating or intends to restore to operations.

**Item 13.** Within seven (7) days of receipt of this Amendment, BP shall submit a plan for approval by the Western Region Director to extract and analyze representative samples from

the pipe wall of the EOA 34-inch pipeline. The plan shall be designed to ensure that the sampling and analysis is sufficient to enable BP to determine the amount of calcium carbonate deposits present in this section of the EOA oil transmission pipeline. These representative pipe samples will be taken from locations in the pipe wall to avoid disrupting the cleaning pig operations. BP shall implement the plan within seven (7) days of approval.

**Item 14.** Within 48 hours of receiving the contractor report, BP shall report to Alyeska the information collected in accordance with Items 11, 12, and 13, so that Alyeska can revise its *Impact Assessment of BPXA Pigging-Interim Report* and evaluate the downstream risks to TAPS of permitting BP to move sediments, deposits, or other materials dislodged in cleaning operations into the TAPS pipeline.

**Item 15.** No later than August 8, 2006, BP shall develop, and submit for approval by the Western Region Director, preliminary engineering design and implementation plans to install permanent facilities for handling solids that may result from cleaning pig operations on the specified pipelines. BP shall ensure the facilities do not impair or pose a risk to the operations of TAPS and do not allow large amounts of solids to be moved into the TAPS metering and station piping facilities. Furthermore, these plans shall demonstrate to PHMSA and Alyeska that the oil will meet transit quality specifications. In addition to any facilities that BP proposes, BP shall also concurrently develop a contingency plan, including preliminary engineering design and implementation plans, to create a by-pass around TAPS PS-1 facilities, so solids can be delivered directly into TAPS storage tanks. Upon approval by the Western Region Director, BP shall commence construction in accordance with the plans, unless it has earlier demonstrated to the satisfaction of the Western Region Director that it is implementing or immediately prepared to implement an alternative method for handling solids dislodged in cleaning operations or that such construction is otherwise unnecessary.

**Item 16.** No later than August 1, 2006, BP shall develop, and submit for approval to the Western Region Director, a plan to safely remove the crude oil in the OT-21 line segment by August 22, 2006. The plan shall provide for removal of the crude oil in the OT-21 pipeline segment in a safe and environmentally sound manner, and in compliance with all applicable federal, state and local laws and regulations.

**Item 17.** Within 30 days from receipt of this Amendment, BP shall submit a report to the Western Region Director, detailing its actions and plans for replacing, abandoning, and/or restoring operation of OT-21. The report shall include preliminary or final engineering and implementation plans and timetables.

**Item 18.** BP shall carry out the requirements of the CAO, as amended, in accordance with all applicable federal, state and local laws and regulations, including any applicable federal, state and/or local regulations regarding oil transfer procedures, spill prevention and response, the State of Alaska's Oil and Hazardous Substances Control Statutes and Regulations in the Alaska Administrative Code, Title 18, Chapter 75, and the US Environmental Protection Agency's Spill Prevention Countermeasures and Control Regulations found in Title 40 Code



of Federal Regulations, Part 112. These regulations as well as others may contain certain requirements for transfer procedures, spill containment, clean-up and reporting requirements that pertain to operations associated with removal of the crude oil from the pipeline.

**Item 19.** With respect to each submission that under this Order requires the approval of the Western Region 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 the deficiencies, (d) disapprove, in whole or in part, the submission, directing that BP modify the submission, or (e) any combination of the above. In the event of approval, approval upon conditions, or modification by the Western Region Director, BP shall proceed to take all action required by the submission as approved or modified by the Western Region Director. In the event that the Western Region Director disapproves all or any portion of the submission, BP shall correct all deficiencies within the time specified by the Western Region Director, and resubmit it for approval. In the event that a resubmitted item is disapproved in whole or in part, the Director may again require BP to correct the deficiencies in accordance with the foregoing procedure, and/or the Director may otherwise proceed to enforce the terms of this Order.

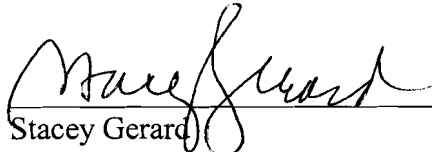
**Item 20.** BP shall maintain documentation of the safety improvement costs associated with fulfilling the March 15, 2006 CAO and submit to the Western Region Director, Pipeline and Hazardous Materials Safety Administration. Costs shall be reported in two categories: 1) total cost associated with preparation/revision of plans, procedures, studies and analyses, and 2) total cost associated with replacements, additions and other changes to pipeline infrastructure.

**Item 21.** The requirements of this Amendment may be modified only by written notice of the Associate Administrator for Pipeline Safety. A request for modification of any requirements imposed by this order shall be in writing and include an engineering justification and certification by an authorized officer of the company as to the accuracy of any facts offered in support of the request.

This Amendment does not modify, waive or supplant any requirements imposed under the March 15, 2006 CAO or any requirements that apply to BP's pipeline systems under any other provision of federal, state, or local law, or permit.

With respect to all actions undertaken pursuant to this Amendment, BP is responsible for achieving and maintaining compliance with all applicable federal, state, and local laws, regulations, and permits. This Amendment is not and shall not be construed to be a permit, or a modification of any permit, under any federal, state, or local law or regulation.

In accordance with 49 U.S.C. §60122 and 49 C.F.R. § 190.233, failure to comply with the CAO, as amended, may result in the assessment of administrative civil penalties of up to \$100,000 per violation per day pursuant to 29 U.S.C. §60122, or in the imposition of civil judicial penalties and other appropriate relief pursuant to 49 U.S.C. §60120. The terms and conditions of this Amendment are effective upon receipt.

  
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Stacey Gerard  
Associate Administrator  
for Pipeline Safety

JUL 20 2006

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Date Issued