UNITED STATES DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION

Oversight Hearing on
Low Pressure Liquid Pipelines:
In the North Slope, Greater Prudhoe Bay, Alaska

Before the
Committee on Transportation and Infrastructure
United States House of Representatives

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WRITTEN STATEMENT OF VADM THOMAS J. BARRETT, USCG (RET.)
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PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION
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COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
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I. INTRODUCTION

Chairman Young, Ranking Member Oberstar, members of the Committee, thank you for the invitation to appear today. I am pleased to discuss the actions of the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) to oversee safe operations of BP Exploration pipelines on the North Slope of Alaska and prevent future pipeline corrosion problems on low stress pipelines.

The responsibility for safety rests first with the operator. Our mission is achieving and maintaining the safe, environmentally sound and reliable operation of the nation's pipeline transportation system. In practice, this requires understanding the condition of pipelines in the U.S. and assuring that operators take action to address any unsafe condition. We make full use of the authority given us in the Pipeline Safety Improvement Act of 2002.

Our progress with pipeline integrity management programs positioned us to take effective action when the BP low stress transit line failed in Prudhoe Bay. Quick DOT/PHMSA action has been crucial to improving the performance of BP since the first spill. As a result of additional

controls we imposed, limited operation of these key pipelines has continued. We are also working hard to allow restoration of lost production capability as soon as it can be safely achieved.

We have proposed new federal regulations for low stress pipelines including the BP lines that recently failed. The rules have been under development for several years and would prevent the type of corrosion failure BP allowed to develop at Prudhoe Bay.

Over the past six years, PHMSA designed and executed a risk-based systems approach to oversight of the national pipeline infrastructure. We undertook rulemaking projects on a risk prioritized basis, acting first on those parts of the infrastructure that posed the greatest risk to people and then the environment. To begin the program, we defined high consequence areas and mapped the locations, including areas unusually sensitive to environmental damage, in the National Pipeline Mapping System. Building on this framework, we developed and implemented integrity management requirements for large and small high pressure hazardous liquid pipelines and high pressure gas transmission pipelines.

Because they operated at less than 20 percent of their rated strength, the BP transit pipelines that failed in Prudhoe Bay had not been regulated by DOT. However, on August 31 we proposed rules to bring these lines under Federal oversight. Our proposal provides robust integrity protections, including corrosion control with cleaning and continuous monitoring, integrity assessment, leak detection and other safety measures for low stress pipelines. The proposal is designed to protect

unusually sensitive environmental areas in rural locations and would mandate a level of care well in excess of what BP had in place on the lines that failed.

The recent BP pipeline failures in Alaska are not indicative of the safety of the national pipeline infrastructure, which has a steadily improving safety record. Furthermore, BP's practices on its low stress lines in Alaska are not characteristic of other low stress pipelines in the U.S. lower 48 states. Based on information developed in connection with our rulemaking proposal, we believe that most other unregulated low stress pipelines are operated to a higher standard of care.

Since March 2 we have been working steadily to ensure BP adequately addresses the safety, integrity and reliability of all of the company's pipelines. While PHMSA was not previously regulating BP's three low pressure transit lines in Prudhoe Bay, following the spill we exercised our statutory authority to protect life and the environment. These pipelines will remain under DOT orders as long as we believe they pose a threat to life and the environment.

II. WHAT DOT HAS DONE TO RESPOND TO THE BP FAILURES

PHMSA immediately took acting following the March 2nd spill. When the failure was discovered on a segment of 34" diameter above ground pipeline in the Western Operating Area referred to as OT21, we offered our assistance on cleanup to the Unified Command conducting the response operation, under leadership of the Environmental Protection

Agency (EPA). Shortly thereafter, PHMSA notified EPA, the Department of the Interior, and state agencies, as well as the Joint Pipeline Office (JPO), of our intent to exercise statutory jurisdiction over these three transit lines by issuing a Corrective Action Order (CAO), essentially taking the Federal oversight role in the remediation and repair of the failed line. Our order covered the Western Operating Area line, which failed in March, as well as the Eastern Operating Area and the Lisburne lines, a total of 22 miles of low stress lines. Our mission is and remains ascertaining the condition of these lines, understanding the failure mechanisms, and assuring that the operator takes all needed action to keep them operating safely in the future.

Our Corrective Action Order required BP Exploration Alaska, Inc. (BPXA) to determine the condition of its pipelines and to repair defects. First, we ordered BPXA to run what are known as cleaning or maintenance pigs in order to remove solids in the line and to perform in-line inspections, known as smart pigging, in order to understand the pipe condition from the inside out. Second, we directed more frequent testing, and an enhanced corrosion management plan, including changing the level of corrosion inhibitors to improve corrosion prevention. We required running cleaning pigs on a routine basis to remove water and other constituents that could contribute to internal corrosion. Third, we set standards for assuring integrity of each of BPXA's low stress pipelines in service. Fourth, we dispatched the first of many inspection teams to inspect the pipe that failed, assess the cause of failure, review operations and maintenance records, monitor operations, including testing, inspect repairs, and verify compliance with our requirements.

Our inspection indicated the probable cause of the failure was internal corrosion. According to records provided by BPXA to the agency, the line that failed had been operating at a very low pressure, well below the 20 percent of designed yield strength that would have been the threshold for DOT regulation. BPXA's records indicate that this pipeline was designed to operate at approximately 825 psi and BPXA was operating it at about 80 psi. Most of the line is above ground on vertical and horizontal supports. The pipeline is bare steel pipe, covered with thermal insulation, surrounded with a steel jacket. The pipeline had been hydrostatically tested in 1977, and was internally inspected with a smart pig in 1990 and 1998. We found no history of previous failure. A leak detection system was installed and working but did not sound during the leak.

Until recently, BPXA has not moved as swiftly as we would have expected to comply with key requirements of our order – namely, the requirements to clean and smart pig its low stress lines. Soon after we issued the order, BPXA advised PHMSA that it would not be able to comply with the requirements to "smart pig" the lines within the specified time period, a critical step in meeting our objective of having the best possible understanding of the condition of the pipelines.

On May 23, PHMSA dispatched a more comprehensive field investigative team to evaluate all potential integrity threats to the transit lines along with BPXA programs to mitigate those threats. The team reviewed BPXA's overall program to manage the transit lines, assessed findings emerging from the monitoring plan, reviewed inspection

records, observed testing procedures used on the transit lines, toured all facilities, interviewed technicians, reviewed qualifications of personnel, inspected test records, and reviewed the leak detection system. The team suggested improvements for BPXA's Interim Monitoring Strategy such as increased corrosion monitoring points to reduce the risk that vulnerable locations could be overlooked. PHMSA directed BPXA to increase the inspection frequency to provide an early warning of any unanticipated corrosion acceleration. We directed that more stringent repair thresholds be incorporated in the program and asked that communications be improved between analysts and field teams. We also required improved patrolling of the lines. Since the May field inspection, we have maintained a field oversight presence at all times to ensure the operator was taking the actions necessary to maintain safety.

Based on our analysis to date, we believe that internal corrosion, induced by microbial activity, caused the pipe to deteriorate at the point where it failed – a low section in a caribou crossing. Typically, operators control this type of corrosion through a combination of cleaning pigs and corrosion inhibitors. The cleaning pig is usually necessary to deliver the corrosion inhibitor to the pipe wall and to disperse active bacteria colonies.

We do not understand why BPXA did not address these problems more aggressively much earlier. BPXA could have used cleaning pigs to clean out liquids accumulating in low spots within its low stress pipelines. Further, there is a high likelihood that cleaning pigs would have improved the effectiveness of the corrosion inhibitor by getting the

chemicals to the wall of the pipeline without the interference of solids and other deposits. Given the many risk factors in the North Slope environment, including use of water in the production process, the chemistry of the crude oil product itself, and the varied geologic factors in the production field, it is a mystery why BP chose not to run cleaning pigs on these lines on a regular basis. Based on information received in connection with developing our proposed rulemaking for low stress pipelines, we believe most operators demonstrate a higher standard of care in their operations, whether or not they are federally regulated.

In June BPXA sought extension of our deadlines for the pigging, contending that factors beyond its control made it impossible to complete the required pigging until the latter half of 2007. BPXA proposed alternatives it claimed would provide safety equal to what could be accomplished with a smart pig until the three transit lines could be smart pigged. We denied the requested extension but issued an order making it clear that we were not ordering BPXA to shut down its operations on the basis of its failure to meet the pigging deadlines. We had preliminarily reviewed the alternative test procedures and the testing data furnished by BPXA, and did not believe that an immediate shutdown was required for safety. Our order expressly reserved enforcement options with respect to BP's failure to comply with the deadlines.

PHMSA engineers were very concerned about the primary reason BPXA gave for its alleged inability to complete pigging -- build up of solids, including impurities in the product stream such as waxes and other materials. Alyeska, the operator of the Trans-Alaska Pipeline (TAPS),

had notified PHMSA about its concerns with adverse impact on its pipeline if these solids should be allowed to pass through from BPXA to TAPS. The Joint Pipeline Office (JPO), which coordinates TAPS issues, had concerns as well, and ensuring the continued safe operation of TAPS is a primary concern of PHMSA.

PHMSA needed to better understand the amount, composition and density of this "sludge" material and how it would be handled before we could allow BPXA to proceed with pigging to be sure that BPXA operations could pose no risk to the safety and reliability of the Trans-Alaska Pipeline System. Alyeska needed to be certain about its ability to handle the waste. BPXA put forward preliminary estimates of as much as 12 inches of sludge, with varying amounts in different segments of its 22 miles of transit lines. After several weeks, BPXA revised its estimate of the amounts of sludge in the lines downward. Based on evidence that there was limited sludge in the Lisburne line, BPXA pigged that line in June. PHMSA still does not have a confident estimate of the amount of sludge in the line segments that have not yet been pigged. BPXA also took months to develop plans to handle the removal of sludge.

Because of the delay in resolving this and other issues, in early July, I, along with my Chief Safety Officer, Ms. Stacey Gerard, and my Western Regional Director, Mr. Chris Hoidal, traveled to Prudhoe Bay and Anchorage to meet with BPXA and Alyeska executives, JPO officials and State of Alaska representatives and to see first hand what BPXA was doing to comply with our order. I was concerned about the pace of progress and the level and quality of BP's efforts to overcome

engineering or other issues that would complicate or delay required maintenance and smart pigging. Four months had elapsed since the first spill, and BPXA should have been pursuing all available options for handling the sludge and preparing for pigging, investing in multiple plans to minimize further delay. What we observed instead was a disappointment. BPXA's rate of progress was slowed by ineffective problem solving, poor communications, delay in ordering needed parts and equipment, and failure to complete actions needed to fully understand the condition of the pipelines and address the conditions uncovered.

For example, BPXA had told us in May of the need to order valves and stopples to isolate a certain section of the failed pipeline and the need to move the pig launcher around the failed site. Two months later, during our July visit, we learned that some parts were still not ordered. It is still not clear to us that it was impossible to make plans to remove the solids and begin pigging operations by the June 12 deadline in our order.

Subsequent to this visit, on July 20, we issued an amendment (Amendment Number One) to our original order intended to address these deficiencies by mandating that BPXA develop specific plans and timetables or parallel tactics to expedite pigging operations on lines that had not yet been cleaned. We required development of a preliminary engineering design and implementation plan to install a permanent facility for handling solids resulting from cleaning pig operations plus a concurrent contingency plan for a bypass around TAPS Pump Station (PS)-1 facilities so solids could be delivered into storage. This action

would assure that sediment in the product stream picked up in pigging would be safely managed in tanks to avoid contamination and maintain the safety of TAPS. We required a comprehensive engineering plan for the draining or "de-oiling" of approximately 17,000 barrels of oil contained in the idled OT21 line segment that failed in March. We also ordered the taking of wall samples and gamma ray photography post pigging to gain the best possible understanding of the real time levels of remaining solids.

By the end of July, BPXA was finally making progress to address our safety concerns and to restore reliable energy transportation. I am pleased to report that as a result of these orders extracting product from the OT 21 segment of line was completed in late August. The PS-1 bypass – aimed at delivering solids from the WOA line through the use of a bypass line into TAPS storage tanks – was successfully hydrotested in early September, and an alternate bypass, "the Fizzy Bypass," should be completed at the end of September.

On July 22, 2006, 37 days after the deadline established in our March order, BPXA performed the smart pigging ordered by PHMSA on the 30 inch segment of the FS2-FS1 Eastern Operating Area pipeline. BP informed us of the results of the testing on August 4. The report identified 16 locations of wall loss in excess of 70 percent, including two over 80 percent, at 12 separate areas. Moreover, 187 sites showed pipe wall loss exceeding 50%. While the failure on the Western line occurred on a low spot in a caribou crossing, the locations of severe wall loss on the Eastern line were on straight pipe.

On August 6, BPXA discovered a leak while in the process of performing direct examination of the EOA as a follow-up to the pig inspection. On the basis of this leak and the discovery of several other locations that were beginning to leak, BPXA reported to us its decision to shut down both the EOA line and the Western line. BPXA explained that its decision was based on a complete lack of understanding of the corrosion that could cause this type of wall loss. BPXA subsequently decided to keep the Western line operating and to consider restarting the 34" segment of the Eastern line.

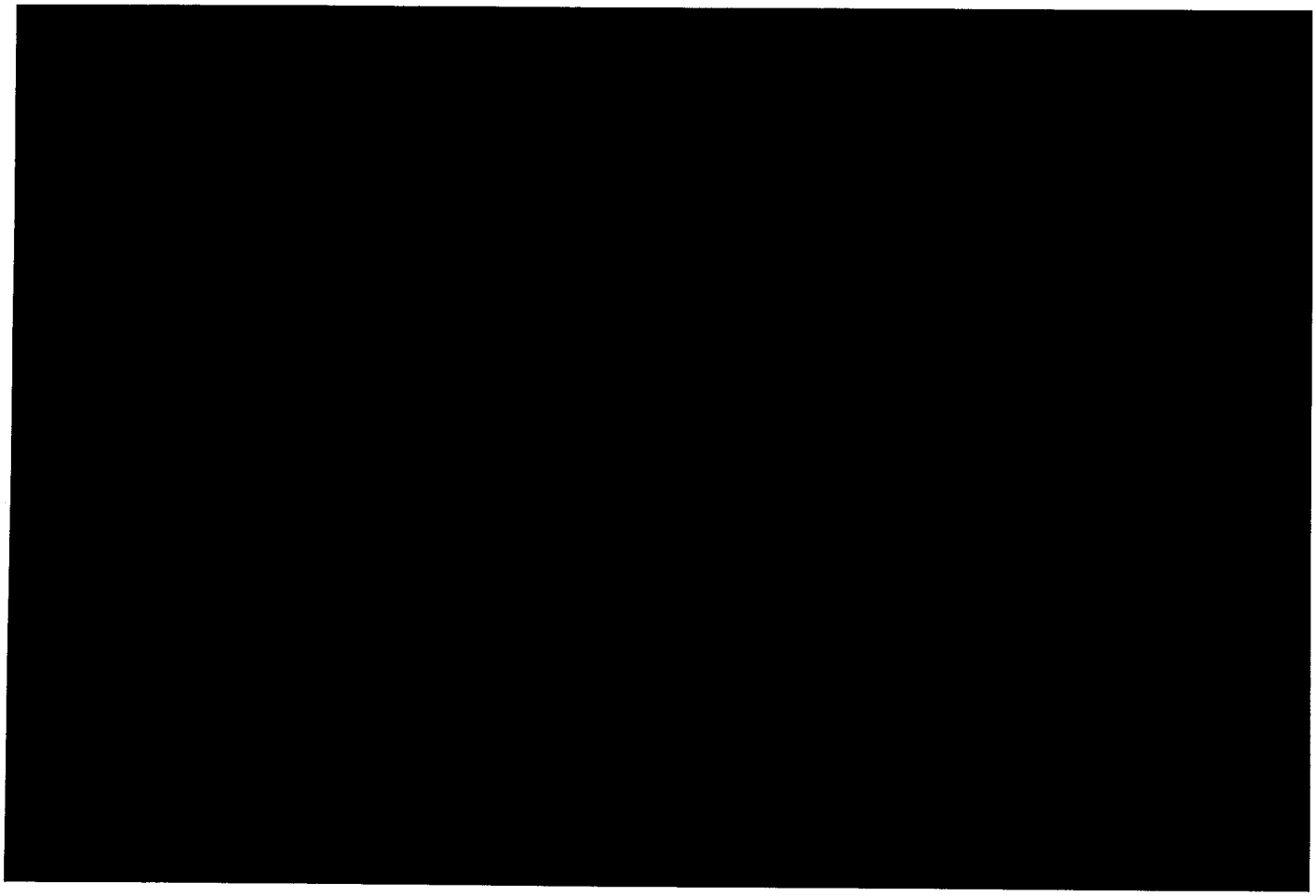
In response to this second spill on the Eastern line, PHMSA issued a second amendment to its order (Amendment Number Two) requiring additional rigorous, automated ultrasonic inspections on a continuous basis of the pipelines that had not yet been pigged and outlining the standards BPXA would need to meet to restart its Eastern pipeline. The order required the conduct of four daily ground patrols using heat-seeking infrared equipment to spot leaks along the entire length of the 22 miles of oil transit lines. The order required continuous automated ultrasonic testing on the outside of the operating portion of the Western line, including the stripping of the insulation to apply the instrument directly to the pipeline. This technology is producing promising results. The order also required the de-oiling of the failed segment of the Eastern line and specified the testing that would be needed on the Eastern line until it could be smart pigged, and as a condition of smart pigging.

In addition to imposing requirements on BPXA, PHMSA further stepped up its presence in Alaska to respond to other potential risks presented by the August 6 BP failure. Our first concern was the impact of the BP transit line shutdown on the Trans-Alaska Pipeline System. Reduced product flow from the BPXA transit lines could cause new safety risks to the TAPS pipeline. The hydraulics of the pipeline is set to operate at a certain threshold of product flow. It was necessary to determine whether the operation could be adjusted to a lower level flow. A reduced level of flow can cause vibrations to occur over certain high elevation passes, causing PHMSA to question whether it would be necessary to monitor strain. Long-term reduced flow rate could also cause an environment more susceptible to internal corrosion. We have determined that Alyeska can adjust the hydraulics to operate at a lower flow rate, that it is monitoring the strain caused by vibrations, and that it has an aggressive cleaning pig program to minimize internal corrosion.

Given the impact of the BPXA line shut down, we were also concerned about any immediate risk that could lead to a shutdown on any of the other feeder lines to TAPS. We therefore deployed a team to update our knowledge of the risks to these other pipelines, including Kuparuk, Alpine, Badami, North Star, Oliktok and Milne Point. We were particularly concerned about a nine-mile section of non-piggable line on Kuparuk. While we have some long-term integrity management issues, no immediate risks were detected.

The Acting Secretary of Transportation, Maria Cino visited Prudhoe Bay in August to assess the situation first hand. My Acting Associate

Administrator for Pipeline Safety, Dr. Ted Willke has been on site several times and I visited again the last week in August to assess compliance with our orders. We are presently working with BPXA on its plan to restart the 34" diameter section of the Eastern line and the conditions BP would need to meet to satisfy our safety concerns. Given that BPXA was not able to sufficiently explain the causes of the corrosion on the Eastern line, and the potential extent of damage to the pipe wall, PHMSA has required that BPXA demonstrate that the Eastern line is in safe condition for pigging operation. The wall condition must be satisfactory to return flow to the line and pass a smart pig through it, without creating the risk of environmental harm. On August 29, PHMSA provided detailed written guidance to BPXA as to how it must demonstrate the Eastern line integrity prior to commencing pigging operations and make appropriate arrangements for spill contingencies. PHMSA will authorize restart for testing only when we have adequate data and corrosion modeling plus analysis that does not place undue reliance on the results of data collected on the in-service segment of the Western line. Given recent progress with the terms of the amendments to our CAO, we are hopeful that smart pigging of the 60 percent of the 22 miles of low stress pipelines that have not yet been tested can be started early this fall.



PHMSA will maintain the high level of oversight needed to enforce compliance.

III. PREVENTING FUTURE CORROSION PROBLEMS ON LOW STRESS PIPELINES

Because they operate at low pressure the BPXA lines that failed on the North Slope had not been previously regulated by PHMSA. On August 31, PHMSA proposed new safety requirements that would bring these lines under federal oversight. Our proposed rule applies to facility operators of hazardous liquid gathering and low stress pipelines in rural areas. We already regulate low stress lines in populated areas, those

impacting navigable waterways, and those transporting highly volatile liquids.

Our regulatory proposal employs a risk-based approach – we intend to protect all lines that, in the event of a failure, pose the threat of significant environmental harm to unusually sensitive areas, or USAs, a term defined in our regulations. The proposal addresses the most significant threats, corrosion and external damage, and applies a full range of protections known to be effective and appropriate against these risks to these lower pressure lines. For low stress lines, we have determined these to be lines within a ¼ mile of a USA and of a diameter of 8 5/8 inches or more. We estimate that the rule will cover an additional 600 miles of low stress lines.

The scope of our rulemaking proposal for rural low stress lines is based on the size and pressure of the lines and the volume of product that could be spilled. We reviewed data provided to us by operators of rural low-stress pipelines, on the history of spills from these types of lines. Two thirds of those spills traveled no more than about 100 feet. The one third that spilled larger amounts traveled less than a quarter of a mile from the pipelines. No spill traveled as far as one quarter mile. We reviewed the operations of many companies and determined that most low stress pipelines are short in length, between one and five miles, and relatively small in diameter, between 8 5/8 inches and 16 inches. By calculating what volume of product these pipelines could spill, and how the product could spread in the event of the spill, we determined that larger pipelines

within one quarter mile of an unusually sensitive area should be regulated.

The proposal provides additional robust integrity protection to areas where oil pipelines in rural areas could affect drinking water resources, endangered species and other ecological resources. In our review of the several hundred spills from pipelines of this type, we determined that the causes of failure were almost always corrosion or excavation related damage. Given the small size of most of these pipelines, we chose not to require formal risk analysis, but instead require operators to focus and protect against these two risks.

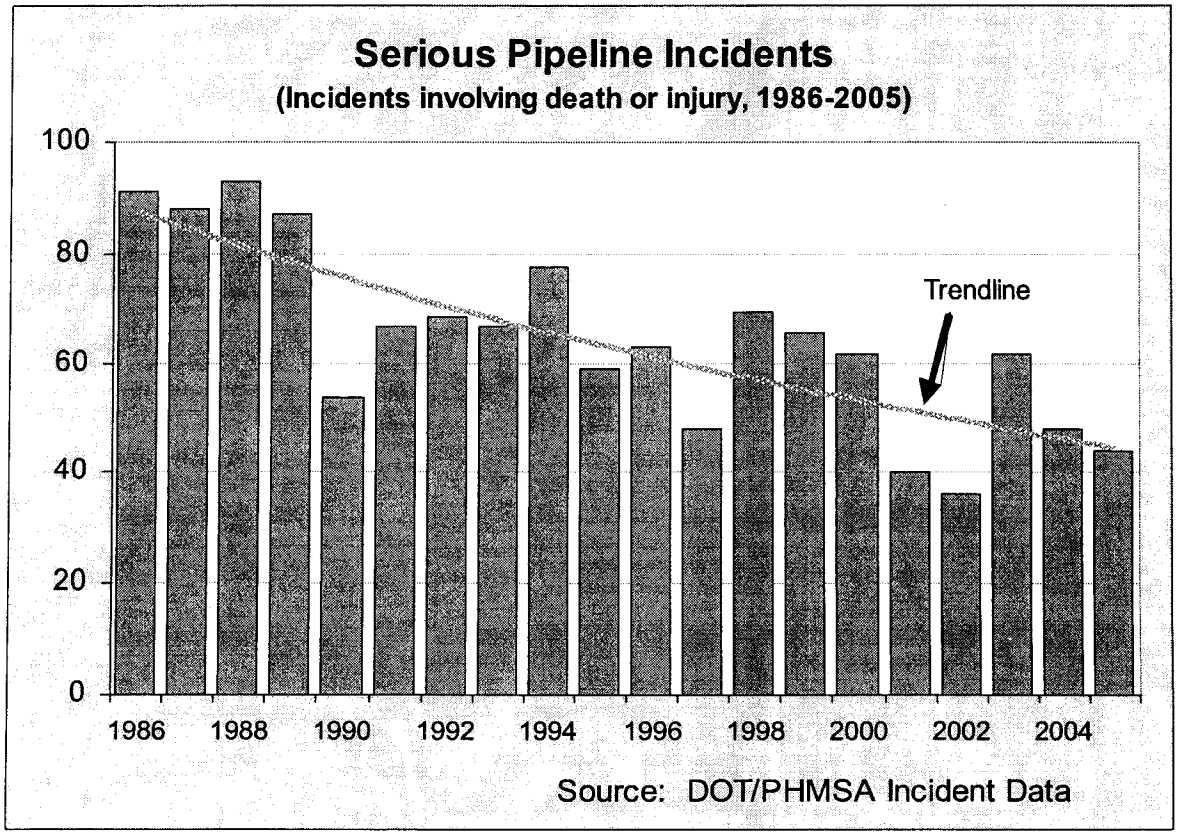
The proposed rule will specifically enhance corrosion protection by requiring: (1) all of the corrosion protection prescribed by the current Part 195 of Title 49 of the Code of Federal Regulations; (2) specific cleaning procedures and continuous monitoring for operational changes that could introduce new risks; and (3) that operators address the risks identified. The proposal requires the same level of integrity assessment as required on high stress transmission lines, including smart pigging, hydrotesting or equivalent alternatives.

The proposed rule notes "the operator may" use one of several forms of assessment to address all threats. This language imposes the same assessment requirements already mandated on high pressure transmission lines. This action is consistent with other current rules and recognizes the fact that some segments of lines will not be piggable and that other alternatives may be appropriate. Similar to the IMP program, we require

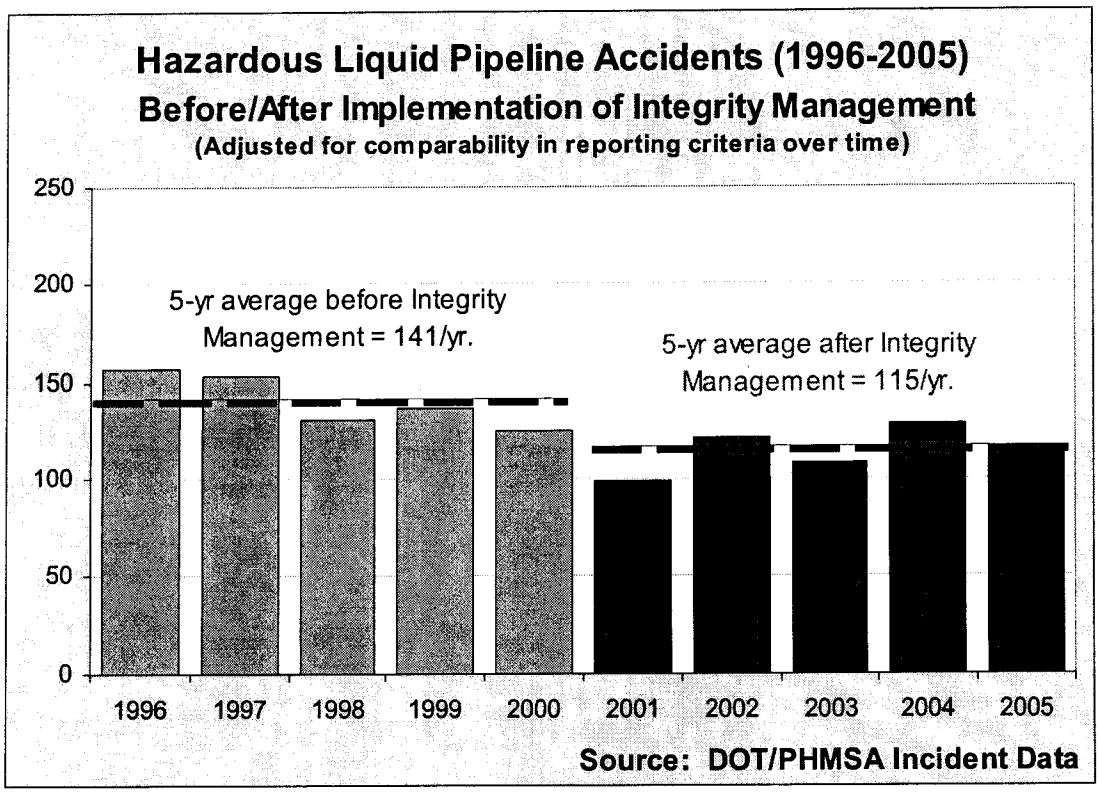
leak detection and require operators of these lines to follow safety rules for design, construction, testing, and maximum operating pressure. In addition, the proposal would require operators to protect the lines from excavation damage, install and maintain line markers, establish operator qualification and damage prevention programs, provide public education, and report accidents and safety-related conditions. Compliance with the new protections will be subject to rigorous inspection by PHMSA pipeline safety inspectors, or state inspectors trained to the same level as federal inspectors. In the event an inspector finds an operator's program inadequate, we would order program or procedural changes. For example, initial inspection of the adequacy of high pressure transmission integrity programs found that 80 percent needed improvement. PHMSA took action with respect to all programs needing improvement. Most low stress lines in the U.S. lower 48 States are much smaller in diameter than the low stress lines that BPXA operates on the North Slope. Many operators of unregulated crude oil low stress lines already have programs in place to regularly clean and test their pipelines. Nonetheless, the regulation we have proposed provides a strong set of requirements to protect rural environmental areas. We also posed questions in the notice of proposed rulemaking to get the best possible information to complete the rule, including whether we should extend protections beyond the ¼ mile area, whether we should require all unregulated lines to report spills, whether implementation time frames are appropriate, and other questions to help scope the final requirements. We will modify the regulatory proposal as needed based on information that becomes available on the docket.

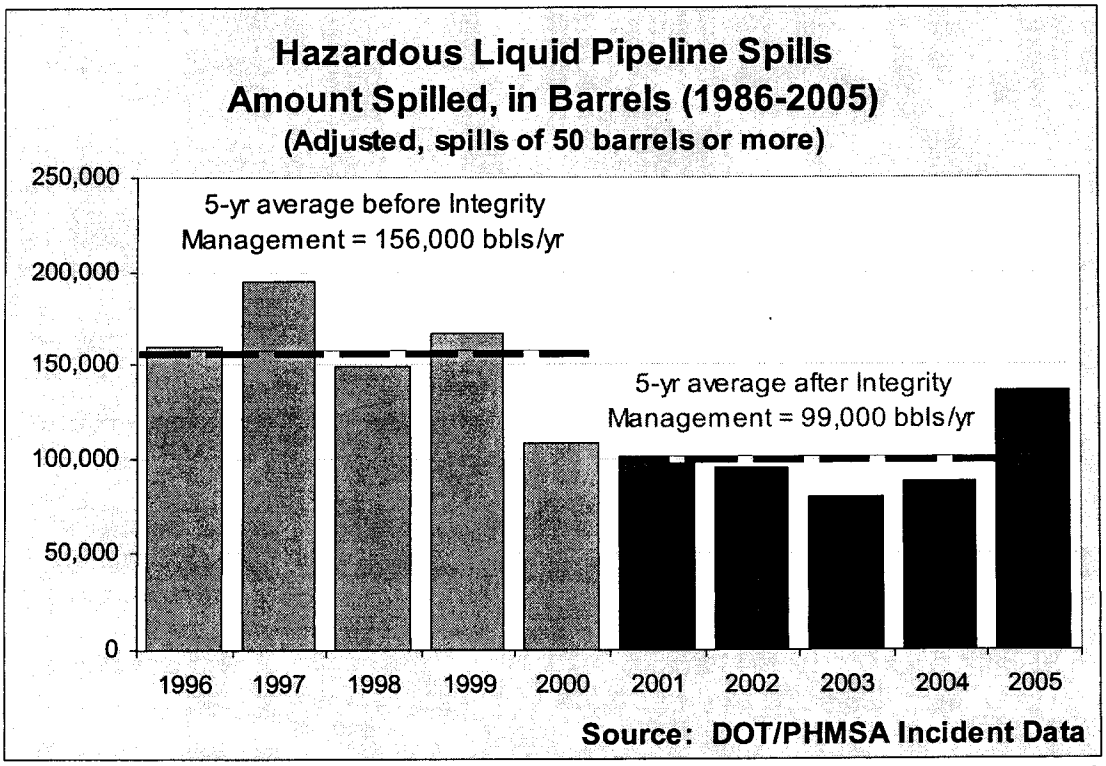
IV. THE U.S. PIPELINE INFRASTRUCTURE IS SOUND

The recent Alaska incidents are not a bellwether for the health of the majority of the U.S. energy pipeline infrastructure. Overall, the pipeline infrastructure is in far better shape than the BP low stress lines at Prudhoe Bay. PHMSA has designed and implements a strong risk-based systems approach to ensure the safety and reliability of our nation's energy pipeline infrastructure and this approach is having very positive results. The number of serious incidents in which people or the environment are harmed is steadily declining, particularly on oil pipelines.



Comparing the five year periods before and after integrity management programs were implemented on hazardous liquid pipelines, spill frequency dropped 18 percent and volumes spilled dropped 35 percent.



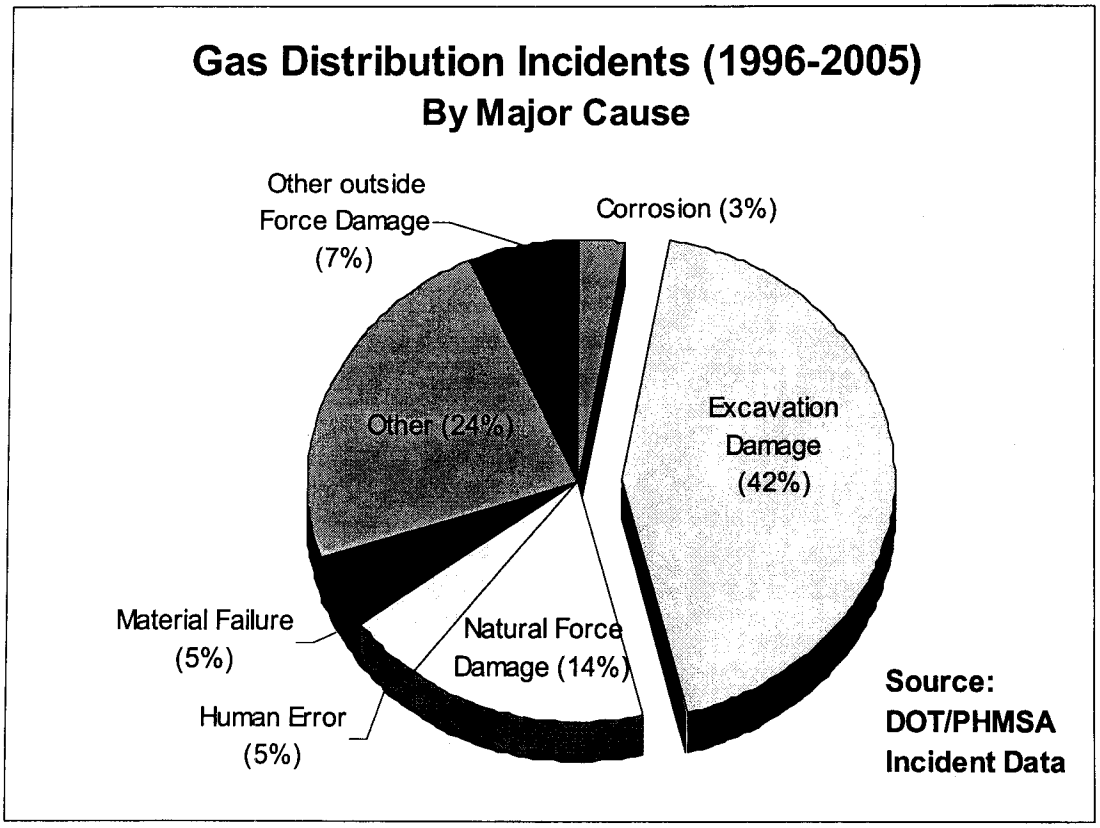


The leading cause of failure on hazardous liquid transmission pipelines are down nearly 50 percent since the integrity management program was put in place in 2000. Operators have a better understanding of the condition of their pipelines and the pipelines are in better condition. Safety programs are improving and will sustain improved performance in the future. PHMSA closely monitors operator-specific performance and flags companies for more intense oversight and inspection if their performance is found to be declining. We had flagged BP as one of those companies, prior to the accident in March. We have several enforcement actions in place against BPXA and its affiliate, BP Pipelines, for shortcomings in its integrity management on regulated lines in Alaska. We have taken actions in recent years against BP North America for compliance issues in the lower 48 States. We intervene with operator executives to address performance issues, usually before accidents happen, and do not just respond after the fact. We make full use of all our enforcement options, including civil penalties at the higher level authorized under the Pipeline Safety Act of 2002. A summary of our progress on completing recent and past mandates and recommendations is attached.

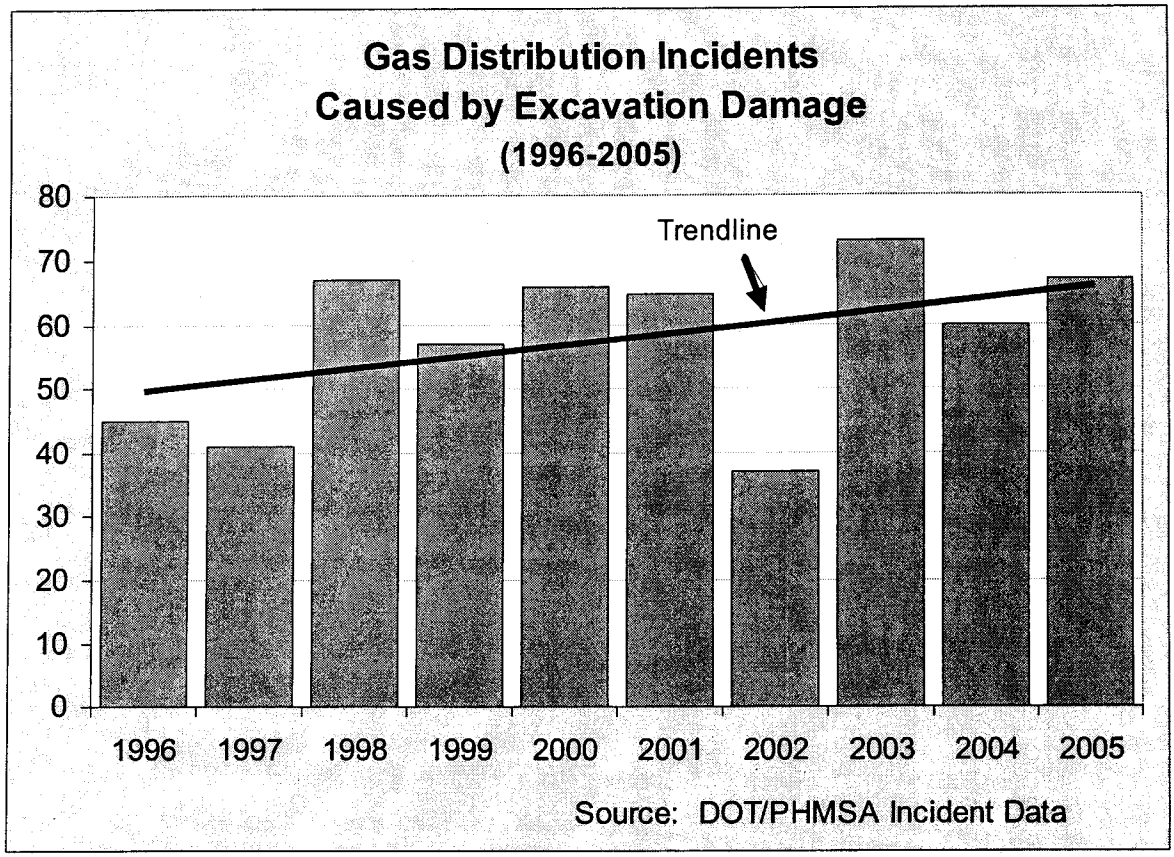
V. LET'S NOT LOSE SIGHT OF THE MOST PRESSING SAFETY PROBLEM

In the past few years, PHMSA has taken a hard look at incidents, their causes, and what can be done to prevent them. One thing is clear – the leading cause of incidents (42 percent of total) in which people are hurt or killed is construction-related damage causing an immediate rupture or

damage that later grows to failure. This occurs most often on the gas distribution systems that run through the neighborhoods where people live and work.



Unfortunately, since 1996, incidents of construction-related damage to distribution systems have increased as much as 49 percent. These incidents are in areas where people are most likely to be hurt.



This part of the pipeline system, the distribution network, is almost entirely under the jurisdiction of States, our foremost partners in pipeline safety. These incidents are almost entirely preventable. We need to help States do more, and we need new authority to make this happen.

The Secretary of Transportation recently submitted to Congress the Administration's legislative proposal to reauthorize and improve pipeline safety and protection for the environment, and enhance infrastructure reliability. The proposal, the "Pipeline Safety and Reliability Improvement Act of 2006," aims to build on our progress in achieving the mandates of the 2002 Act by placing more emphasis on damage prevention and enhancing state programs' oversight of pipelines. It

would also eliminate what we believe to be a counterproductive requirement for mandatory reinspection of gas transmission lines every 7 years. The Government Accountability Office has just issued a report agreeing that a risk-based
reinspection approach would be preferable.

These reauthorization concepts are generally supported across our stakeholder community, including the Federal and State family, and we are pleased to see many of these priorities reflected in the Committee's bill.

VI. CONCLUSION

I assure the members of the Committee that the Administration, Acting Secretary Cino, and the dedicated men and women of PHMSA share your strong commitment to improving safety, reliability, and public confidence in our Nation's pipeline infrastructure.

Like you, we understand the importance of our mission to the safety of our citizens and the energy security and continued economic growth of our great Nation.

Thank you.
I would be pleased to answer any questions you may have.

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Attachments:
PHMSA Mandate Progress Chart
PHMSA Mandate Progress Graph