When Pigs Don't Fly: Trouble on the Trans-Alaska Pipeline

Monday, 25 February 2013 00:00 By Richard A. Fineberg, Truthout | News Analysis
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The 800-mile Trans-Alaska Pipeline stretches across the Arctic tundra, over (and under) more than 800 rivers and streams, and through three mountain ranges. (Photo: Monica Almeida / The New York Times)

Despite tracking devices and personal escorts, the problem of lost, stray and damaged "pigs" points to chronic performance problems along the Trans-Alaska Pipeline caused by the operator's failure to learn from past mistakes.

Fairbanks, Alaska - Chronic problems with pigs on the Trans-Alaska Pipeline System (TAPS) seldom make headlines in the 49th state. But the Alyeska Pipeline Service Company's struggles with the large, bullet-shaped devices that perform in-line cleaning and inspection tasks raise questions concerning safety of operations on the 800-mile pipeline that currently ships more than half a million barrels of Alaska North Slope crude oil daily, primarily to West Coast refineries.

On two occasions since late 2010, TAPS operators were unaware that pigs had gone astray on their watch. In both cases, several days later pig pieces were found, broken and stuck in damaged pressure relief piping. These incidents occurred at Pump Station 5 in northern Alaska on November 25, 2010 and at the pipeline's southern terminal at Valdez on May 14, 2012. The pressure relief systems at each site consist of auxiliary piping and flow control valves installed to smooth turbulent flows encountered as oil speeds downhill from major mountain crossings.

Current TAPS oil shipments are down by nearly 75 percent from 1988's peak average of more than two million barrels per day, with the super-giant Prudhoe Bay oil field declining and replacement production from smaller fields uncertain. During this decline Alyeska has closed six of its ten pumping facilities.

Since 2003, Alyeska has been engaged in automating the remaining pumping units and converting them from jet to electrical power. That project was anticipated to cost $250 million with completion by 2005. However, costs have tripled and the project is not yet complete.

With new pumping systems and lower throughput, TAPS runs colder, resulting in increased water and wax precipitants from pipeline oil. Pigs, which now run weekly, have difficulty removing precipitants from the pipeline, creating recurring problems.

Three major transnational oil companies - British Petroleum (BP), ConocoPhillips and ExxonMobil - own 95 percent of TAPS and control a similar share of North Slope oil. At the end of 2012, these companies were in the process of acquiring the final five percent of TAPS. BP owns the largest share of TAPS (46.9 percent) and also runs the Prudhoe Bay oil field on behalf of producers.

Aleyska President Tom Barrett

Thomas J. Barrett, selected by the TAPS owners to lead their pipeline company through current challenges, took over as Alyeska president on January 1, 2011. Barrett's predecessor resigned in 2010 following a relief tank overflow at Pump Station 9 in central Alaska in May 2010 and reports that Alyeska employees suffered from low morale, distrusted senior executives and feared retaliation for raising concerns about safety and integrity issues.

Barrett brought a unique resume to the job: He served the US Coast Guard for 35 years, retiring as second in command; between 2006 and 2008, he was the first chief of the US Transportation Department's Pipeline and Hazardous Materials Safety Administration (PHMSA); and he came to Alyeska as the first president who had not worked for a major TAPS owner. Under Barrett in 2007, PHMSA hit Alyeska with the largest proposed penalty issued against any pipeline company. More than half of that $817,000 proposed penalty (settled for $506,000 in 2011) was for violations of basic safety procedures that led to a fire at Pump Station 9 in January 2007, during the push to install the new systems.

At PHMSA, Barrett earned praise from colleagues for helping the agency establish a pro-active, data-based oversight system. But as Alyeska's president, he devotes much of his energy and skills to defending and praising the company as it clashes with PHMSA. Barrett's 2006 testimony before a US House investigating committee dealing with BP's North Slope corrosion problems stands in marked contrast to his 2011 testimony to the Alaska House Finance Committee regarding problems at Pump Station 1, at the northern end of the pipeline, where leaking buried pipe shut down the line on his eighth day as president. While Barrett was highly critical of BP in 2006, in the latter testimony he overlooked Alyeska's role in creating problems at Pump Station 1 and celebrated his company's performance during that emergency. He also called for increased oil production in the interest of pipeline safety, incidentally providing ammunition for the advocates of a pending proposal to reduce oil taxes.

PHMSA-proposed penalties against Alyeska have declined dramatically in recent years, at marked variance from national trends. Between 2007 and 2009, Alyeska drew $1,198,800 in proposed civil penalties, including the 2007 proposed fine. By comparison, for the latest three-year period, PHMSA sought a total of just $41,300 from Alyeska - none in 2011 and 2012, Barrett's first two years at Alyeska. While PHMSA's recent proposed penalty assessments against Alyeska plummeted, the agency's nationwide penalty proposals remained relatively constant, dropping by about 12 percent over the same period, from a 2007-2009 average of approximately $6.4 million per year to $5.6 million per year for the 2010-2012 period.

The contrast between PHMSA's sharply reduced proposed penalties against Alyeska and the agency's relatively constant national penalties over the same period could suggest improved performance by Alyeska. That contrast might also reflect Barrett's effectiveness in countering the agency he formerly headed. In either case, careful analysis of recurrent pig problems under Barrett's tenure indicates that Alyeska is slow to identify and correct its problems, placing oil delivery and Alaska's environment at undue risk.

Barrett is no stranger to pipeline pigs. Testifying as PHMSA's chief in 2006, Barrett noted that one of his first actions was to require BP to implement a more aggressive pigging program. That testimony contained a dozen separate references to pigs, covering their importance and their potential for problems.

Scant Press Coverage of Lost Pigs

As 2012 turned to 2013, risks posed by Alaskan oil development were in the national spotlight when Shell Oil's offshore drilling rig Kulluk ran aground off Kodiak Island in the North Pacific Ocean. (Shell is not affiliated with TAPS or current North Slope onshore production operations.) In contrast to intensive coverage of the Kulluk grounding, which followed a string of mishaps associated with Shell exploration efforts on the Arctic Outer Continental Shelf during 2012, press coverage of Alyeska's recent onshore problems has been relatively light.

When TAPS lost track of pigs in November 2010 and May 2012, neither incident was noted in the Alaska press. Following the November 2010 event, repairs to damaged pressure relief piping at Pump Station 5 were reported in government documents and occasional press stories. But press references to those repairs did not discuss the implications of the lost pig event that made them necessary.

Eighteen months later, repairs at Pump Station 5 were nearing completion when another pig got away from TAPS operators and wound up stuck in auxiliary piping at Valdez. That lost pig was not reported in the press until four months later, when the Alaska trade journal Petroleum News headlined the event on September 23, 2012. The delayed press account did not mention that the May 2012 incident was the second pig in two years to get away from TAPS operators and wind up in pressure relief piping.

Details of TAPS pig problems disclosed by this writer were posted in an internet report on December 20, 2012. The following day, Fairbanks Daily News-Miner columnist Dermot Cole posted a blog headlined "Oil industry researcher says Alyeska lost two pigs in two years." Although the electronic edition of the Anchorage Daily News picked up Cole's blog, the hard-copy press did not run news stories; it would be another two weeks before the pig problems detailed in this writer's internet report made statewide news in a January 3, 2013 news broadcast originated by Fairbanks radio station KUAC. Despite lack of press attention, careful consideration of Alyeska's recent struggles with pigs provides insight into the risks of TAPS operations.

Lost Pig #1 (November 2010, Pump Station 5)

On November 16, 2010 - coincidentally the day Alyeska announced that Barrett would soon become Alyeska's new president - a cleaning pig was launched from Pump Station 4 in northern Alaska. The pig insertion was a routine event, without fanfare. Two days later, the pig went astray during an emergency TAPS shutdown ordered when the pipeline operators received a spill report that turned out to be erroneous.

On November 18, the Alyeska communications shop issued an email notice to employees in which the company's acting president praised the "utmost professionalism" of the "countless" pipeline personnel involved in that day's emergency; the communiqué did not mention the missing pig. One week later, the pig turned up, damaged and stuck in piping adjacent to the 48-inch main line at Pump Station 5. It took 18 months to build by-pass piping around the damaged pipe and extract the battered pig.

While Alyeska management was praising staff field performance during the Nov.18, 2010 emergency shutdown, questions about the lost pig were circulating among veteran TAPS observers. A former Alyeska field worker called this writer's attention to parallels between the lost pig and the relief tank overflow at Pump Station 9 that occurred six months earlier, on May 25, 2010. He wondered what had become of Alyeska's promises, made in the aftermath of the overflow, to improve operator recognition of seemingly unrelated factors that can combine to create a mishap, a characteristic known as situational awareness.

Lack of situational awareness on the part of TAPS operators was one of the cluster of causal factors identified in Alyeska's June 2010 incident investigation report on the relief tank overflow. A second significant problem identified in that report was the pipeline company's failure to avoid future mishaps by learning lessons from past mistakes. The report's identification of these defects is particularly surprising because similar problems in 2007 identified at that site helped trigger a line-wide effort to improve learning from experience and correct operating deficiencies.

While the unpublicized November 2010 lost pig incident was a repeat example of operator lack of situational awareness, it was not the first pig to cause problems by going astray. Because Alyeska had previously lost several pigs, the incident stands as another example of failure to learn from experience. In this case, however - unlike the Pump Station 9 relief tank overflow six months earlier – government monitors were quiescent and the press overlooked the lost pig incident.

Pigs Cold, But Not Lost (Pump Station 1)

After Barrett took over at Alyeska on January 1, 2011, pig problems continued to challenge TAPS operations. For example, when leaking pipe encased in concrete beneath Pump Station 1 caused the emergency TAPS shutdown, which the press portrayed as a near disaster that threatened to cut off a major artery for US oil, two pigs were stranded in southern stretch of TAPS. Although they weren't lost, these pigs still managed to contribute to the havoc of that shutdown.

If the line froze or wax buildup in front of the pigs was too heavy to push, restart might not have been possible until spring temperatures thawed the frozen pipeline. For this reason, four days after the January 2011 shutdown, TAPS was re-started on an emergency basis. That restart was risky: Because the leak at Pump Station 1 had not yet been assessed, it was not known whether the increased pressure of pumping would exacerbate the spill. Because increasing the spill beneath Pump Station 1 was deemed a lesser threat than the hazards of an extended shutdown, government officials approved the emergency restart. Alyeska also re-opened Pump Station 7 in central Alaska to send heat to cold pipeline stretches.

The January 2011 emergency shutdown at Pump Station 1 and the relief tank overflow at Pump Station 9 eight months before shared an important common denominator: Failure to mitigate identified risks in a timely manner. According to an assessment report by the State Pipeline Coordinator's Office (SPCO), potential for corrosion leaks in piping at Pump Station 1 was identified in 2008, but no immediate action was taken. That piping, which had been encased in concrete nearly two decades earlier, was not easily reached for inspection and repair. In 2008, Alyeska had assigned the highest risk rating to one stretch of buried, corrosion-prone pipe, while a zero-risk rating was assigned to a smaller segment. But instead of fixing the high-risk problem, Alyeska repaired the more accessible, low-risk portion. Three years later, in January 2011, the unrepaired buried stretch deemed highest risk started leaking.

Throughout the aftermath of the January 2011 shutdown, Barrett expressed strong praise for staff performance during the emergency. The new Alyeska president, whose resume also includes a law degree, challenged the legal grounds on which regulators were attempting to mandate safe practices. Six months later, in August 2011, Alyeska finally agreed with regulators on plans to replace the buried piping with above-ground piping that could be inspected and repaired at Pump Station 1 and elsewhere on the line.

In a June 3, 2011 meeting with this writer, Barrett noted that during the January 2011 emergency, he was surprised by how quickly a shutdown on TAPS could become irreversible. He said that although the pipeline was supposed to be able to restart safely after a 14-day shutdown, just four days into shutdown, the system was in trouble due to cold temperature effects. Barrett also acknowledged that although his top priority at Alyeska was to put more robust pipeline safety systems in place and change the company culture so that workers would feel free to raise safety issues, the emergency shutdown had temporarily derailed those plans.

In response to the January 2011 shutdown, Barrett publicly called for increased North Slope production in the interest of pipeline safety. On June 15, 2011 Alyeska issued its 3-year, $10 million report on low throughput problems. The study said that Alyeska could not guarantee safe delivery below 350,000 barrels per day due to wax buildup, freezing and other problems resulting from low throughput that would hamper pumping and make restart more difficult after a prolonged winter shutdown.

Barrett's position and the June 2011 Alyeska report did not speak to a 2010 Alaska Superior Court decision on TAPS valuation, in which Judge Sharon L. Gleason found that the dramatic increase in oil prices since 1998 would enable the pipeline owners to finance the application of heat to the pipeline. She noted that expert testimony indicated that heat would reduce wax build-up and other low throughput problems, enabling the pipeline to handle significantly lower throughput levels than Alyeska had reported.

Judge Gleason concluded that the TAPS owners had economic incentive to keep the oil flowing because the same companies also control most North Slope petroleum. Her decision noted that if the 48-inch diameter TAPS pipeline was too big to handle reduced throughput problems of cold and slow flow, the TAPS producer-owners could spend as much as $18 billion - the estimated cost of building a smaller replacement pipeline - to keep proven North Slope oil reserves flowing. Based on expert witness testimony, Judge Gleason found that TAPS could continue production until North Slope production fell below 200,000 bpd - far below the minimum 350,000 bpd level Alyeska had studied.

In June 2011, when asked about Judge Gleason's decision, Barrett said that his primary concern as Alyeska's president was pipeline safety, and that economic issues were beyond his purview.

Six months later, in her second ruling on TAPS valuation, Gleason lowered her previous TAPS minimum throughput estimate to approximately 100,000 barrels per day. In that decision, she noted that BP had initially withheld reports from discovery that indicated that TAPS could operate at much lower levels than Alyeska had considered in its June 2011 report.

Lost Pig #2 (May 2012, Valdez)

Repairs to damage caused by the November 2010 lost pig at a northern pump station were nearing completion on May 10, 2012 when workers who opened the Valdez pig receiving unit after a two-day decontamination period were surprised: The pig wasn't there. Seventeen months into Barrett's presidency, another pig had gone missing.

In a terse email four days later, Alyeska informed employees. "As the pig arrived," the notice said, "the pressure relief system was triggered, likely by the incoming wax cloud [pushed by the cleaning pig]. The pig was not in the trap when Operations personnel opened the trap on Thursday." A message the following day assured workers that missing pig parts had been located in a section of nearby relief system piping. Although normal operations had not been restored, the report said, the system was "locked into a safe flow configuration" and "[t]here have been no injuries or shutdowns as a result of this event." In the following weeks, at least some Alyeska personnel were asked to avoid press accounts by refraining from talking about the lost pig with members of the general public.

During a June 14, 2012 private briefing on TAPS operations, Barrett was notably effusive in his praise for Alyeska's performance, but reticent in his response to a query about pig problems from this writer. Without mentioning the recurring fundamental problems - lack of situational awareness and failure to act on lessons learned - Barrett portrayed the May 2012 lost pig at Valdez a as a "pig management issue" that was "all cleaned up," and quickly moved on to other subjects.

As noted above, news of this lost pig did not make the press for four months and the fact that operators had lost track of pigs twice in two years was not reported until the internet posting of December 20, 2012. When Fairbanks radio station KUAC news director Dan Bross contacted Alyeska on January 2, 2013 to follow up on the internet report of the November 2010 and May 2012 lost pig events, Alyeska spokeswoman Michelle Egan asserted that the two events were quite different. According to KUAC's January 3 report, Egan said "the wax cloud pushed in front of the pig caused a pressure change and that opened up our relief system and the pig was drawn into the relief system, instead of the pig trap, where it should have gone."

To emphasize differences between the two events, Egan stated that when Alyeska stopped oil flow in November 2010 due to the erroneous spill report, the pipeline operators "did not take the time to consider where our pig was located, because protecting the environment was the greater concern." By acknowledging that Alyeska operators were not routinely keeping tabs on pig whereabouts, Egan confirmed the continued lack of operator situational awareness – the important component of safe operations identified in the company report on the Pump Station 9 relief tank overflow.

Although Egan asserted differences between the lost pig events, the basic similarities were clear: In both incidents the pipeline operators failed to recognize that changes in pipeline pressure had forced a cleaning pig into pressure relief system piping. The similarities indicated that in May 2012 Alyeska had failed once again to make use of lessons learned to prevent mishaps.

More Pig Incidents

Recurrent pig difficulties on TAPS are emblematic of Alyeska's chronic performance shortcomings in two critical areas identified in company reports: operator lack of situational awareness and failure to learn from past mistakes. This fact underscores the pipeline company's troubling slowness to fix its pig problems: A lost pig in 2000 wound up stuck in pressure relief piping at the Valdez terminal in an incident eerily similar to the May 2012 lost pig event.

Thirteen years later, pig problems continue. Following the January 3, 2013 airing of a news piece about lost pigs, a pipeline worker told radio station KUAC about another pig problem that began on New Year's Day. KUAC's January 10, 2013 follow-up reported that Alyeska recovered that pig without trouble at Valdez on January 8, one week after the pig temporarily went astray at Pump Station 9. According to Alyeska's Egan, "we manually moved that pig through the station, fully without incident. But we knew we had this large wax cloud in front of it traveling down to Valdez, and so we sent a special pig tracking team with a tracking device down toward Valdez to monitor." The short radio follow-up report did not provide details about what had gone wrong, or whether the pipeline company now routinely dispatches personnel to escort a pig through the automated pump stations.

Alyeska's reliance on the wax cloud explanation enables the pipeline company to claim management success. Nevertheless, the May 2012 lost incident demonstrated an apparent continued failure under Barrett to correct fundamental operating problems such as lack of situational awareness and failure to learn from past mistakes.

By blaming the wax cloud for TAPS pig problems, Alyeska evades responsibility for exacerbating the cold flow problems the pipeline company created over the last two decades by closing pump stations, switching to electrical pumps and automating control systems without figuring out how to mitigate cold flow effects. The recent cold flow problems were well known: In *800 Miles to Valdez,* a 1977 book on TAPS construction, James P. Roscow wrote that chilling pipeline oil "causes the wax to separate out and be deposited on the walls of the pipe and storage tanks, requiring the use of mechanical 'pig' scrapers."

Richard A. Fineberg is an independent, Alaska-based oil and gas policy analyst who has reported on Alaska petroleum development issues and the Trans-Alaska Pipeline since 1975.

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The *Fairbanks Daily News-Miner* carried an edited version of this article March 10, 2013 under the heading, “Missing Pigs: Alyeska trips over glitches in cooling pipe (Sunday Focus),” page F-1. The *News-Miner* posted its version on its electronic edition on March 11, 2013 at *http://www.newsminer.com/opinion/community_perspectives/article_bf7828d4-8aa2-11e2-a768-001a4bcf6878.html*.

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In Oakland, Mercado Chain Workers Protest Alleged Sexual Harassment, Firings

By David Bacon, Truthout | Report

Laura Robledo and her daughter. (Photo: David Bacon)

Valentine's Day sometimes brings chocolates and flowers, but in Oakland, California, it brought angry women out to the Mi Pueblo supermarket in the heart of the barrio. There they tried to speak to the chain's owner, Juvenal Chavez, not about love, but about the sexual harassment of women and the firing of whistleblowers who work at the chain. As they gathered next to the parking lot holding pink placards, Latino families in pickup trucks and beat-up cars honked and waved. Laura Robledo then stepped up to an impromptu podium and told her story. As she spoke, her teenage daughter held her protectively around the waist and stared angrily at the doorway, where managers stood waiting for trouble.

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By Chris Hedges, Truthdig | Op-Ed

I was in the Swiss village of Begnins outside Geneva shortly after the fall of the Berlin Wall in November 1989. I spent three days there with Axel von dem Bussche, a former Wehrmacht major, holder of the Knight's Cross of the Iron Cross for extreme battlefield bravery, three times wounded in World War II, and the last surviving member of the inner

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NPR-A nipped

Interior's final decision extends national trend

The federal government's decision late last month to close off oil leasing in almost half the National Petroleum Reserve-Alaska might not have immediate consequences for Alaska and the nation, but those consequences could be significant in the long term.

Decisions to restrict potential oil and gas development on federal lands gradually accumulate and diminish our state and nation's ability to produce energy resources. The effects are not sudden, but they put a real and harmful damper on our economy, as a recent industry summary of leasing statistics has demonstrated.

Before reviewing those statistics, though, consider the final record of decision on the new NPR-A plan, issued by Secretary of the Interior Ken Salazar on Feb. 21.

The decision didn't close off areas already leased, nor did it shut down any wells. Much of the acreage declared off-limits, in fact, likely never would draw much interest in a lease sale, such as the southern uplands of the Brooks Range. The department also explicitly accommodated the possibility of a pipeline across the reserve to carry any oil found in the Chukchi Sea offshore leases far to the west.

However, the plan struck a fatal blow to potential leasing in some of the most promising parts of NPR-A: the plains south and west of Teshekpuk Lake.

SUNDAY Focus

Missing pigs

Alyeska trips over glitches in cooling pipe

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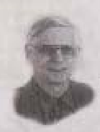
AP Photo/Alyeska Pipeline Service Co.

In this undated photo released by Alyeska Pipeline Service Co., a scraper or paraffin "pig" used to scrape paraffin from the walls of the 48-inch diameter trans-Alaska pipeline, sits inside an Alyeska warehouse.



Richard **Fineberg**

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