

[TAPS Lost Pig Report: How Can You Lose a Pig in a Pipeline?](#)

In Just Over Two Years Alyeska Has Lost Two Pigs on TAPS; Pig Problems Raise This Question: If NTSB Applied the “Four-R” Test To TAPS, Would Alyeska Pass, Or Would Alyeska Flunk?

[Can Alyeska Learn from Past Mistakes?](#)

(Endnotes at Pages 23-29)

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1. Enbridge and Alyeska – Introduction

Despite Alyeska Pipeline Service Company efforts to turn chronic problems on the Trans-Alaska Pipeline System (TAPS) into management success stories and commercials for more North Slope oil development, analysis of recent events on TAPS suggests that if the standards the National Transportation Safety Board (NTSB) has applied to the 2010 Enbridge pipeline spill in Michigan were used to evaluate TAPS operations today, Alaska’s flagship pipeline might not pass that test.

The national safety board’s report on the Enbridge spill, discussed at a board meeting in Washington, D.C. last July, sharply criticized Enbridge management practices that led to a spill two years ago, spewing 20,000 barrels of toxic crude oil into a treasured waterway and causing the illness of more than 300 residents near Battle Creek. Excoriating Enbridge, NTSB Chair Deborah Hersman declared, “You can’t help but think of the Keystone Kops....Why didn’t they recognize what was happening? What took so long?” Hersman answered this question by analyzing the Enbridge spill in terms of what she called “the four Rs of a rupture:”

- recognition of a problem,
- response planning and preparation,
- responsibility for prevention, and
- regulatory oversight. **[1]**

The safety board’s critical analysis of the causes of the 2010 Enbridge mishap and the NTSB chair’s caustic comments drew national headlines from newspapers such as the *Detroit Free Press*, the *Washington Post* and the *Los Angeles Times*. **[2]**

The lessons of Enbridge’s poor performance were very much on the minds of three veteran Alyeska Pipeline Service Company observers interviewed for this report. While most sources

requested anonymity, facts gathered for this analysis show striking similarities between Enbridge pipeline problems on Line 6B in Michigan and recent mishaps on TAPS. This analysis of TAPS operations raises serious questions about the current safety of the 800-mile, 48-inch diameter pipeline that carries roughly 500,000 barrels of crude oil per day across Alaska.

Sections 2 and 3 of this report review operational problems that have triggered recent major shutdowns on TAPS – the relief tank overflow incident at Pump Station 9 in May 2010 and the January 2011 leak and shutdown at Pump Station 1. This analysis shows that the four elements of the Enbridge spill identified by NTSB Chair Hersman were also visible on TAPS and evident in Alyeska’s emergency shutdowns. This report’s analysis also shows that these shutdowns share troubling management failures:

- Both events resulted from Alyeska’s failure to apply lessons learned by executing timely corrections to known problems; and
- Alyeska’s emergency response planning – an important element of pipeline safety – appears to be inadequate.

Regulatory oversight on TAPS – the NTSB chair’s fourth category – is the subject of **Section 4**. This report notes a fragmenting of the Joint Pipeline Office (JPO), which was initially formed to offer pipeline owners one-stop shopping among various government agencies, as well as an apparent shift in dealing with regulatory problems from penalties to a cooperative approach.

On a subject Hersman did not explore in her review of the Michigan spill, **Section 5** also notes a general congruence between Enbridge and Alyeska: company celebrations of prizes and statements of principle that may not translate into safe practice. In drawing this Alyeska-Enbridge parallel, this section also notes this important distinction between the two pipeline companies: Where Alyeska sometimes appears to be withholding information from the public record, Enbridge leaves a clear record of its public statements on its web site.

Section 6 examines the difficulties Alyeska continues to experience handling pigs – the large, bullet-nosed devices that pipeline operators send through the line to perform internal cleaning and inspection tasks. This section reveals that in the last three years Alyeska has lost control of pigs on at least two occasions. (Also discussed in this section are the difficulties Alyeska encountered with pigs that weren’t lost during the January 2011 emergency shutdown at Pump Station 1.

Although downplayed by Alyeska and unnoticed by the press, veteran TAPS observers viewed the first lost pig event – in November 2010 at Pump Station 5 – as a demonstration of a continuing lack of situational awareness on the part of TAPS operators. Six months earlier, the same operating deficiency was identified by Alyeska’s internal investigation report as a root cause of the Pump Station 9 relief tank overflow. News of the latest lost pig, in May 2012 at Valdez, finally made the press four months after the fact. But the belated press coverage of this incident did not explain what happened or explore the striking similarities between this event and its under-reported November 2010 predecessor.

Section 7 reviews the performance record of Alyeska president Tom Barrett as he finishes his second year as Alyeska’s chief executive. Barrett came to Alyeska with a strong reputation as a regulator, having served as the first administrator of the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) between 2006 and 2008. He was highly regarded by federal agency staffers, who credit him with establishing pro-active, data-based programs to support the agency’s pursuit of pipeline safety goals. Today, however, he devotes much of his energy and skills to defending and praising the company he now heads as it clashes with PHMSA. There is a notable contrast between [Barrett’s testimony before Congress in November 2006](#) (after British Petroleum’s corrosion management problems temporarily shut down operations at Prudhoe Bay) and his [testimony to the state House Finance Committee in March 2011](#) (after

the TAPS emergency shutdown at Pump Station 1 occurred in Barrett's second week as Alyeska's president). In his 2006 testimony, Barrett focused on BP's shortcomings; five years later Barrett overlooked the history of the problem Alyeska had created for itself at Pump Station 1. Instead, he called for increased North Slope production to increase TAPS throughput in the interest of pipeline safety. In making this plea, Barrett effectively converted his concerns for safe pipeline operations into political fodder for the advocates of reduced state oil taxes.

The recent TAPS operational problems detailed in this report indicate that Alyeska under Barrett is still slow to learn from experience and slow to address important problems. These management deficiencies result in the exposure of TAPS, its workers and its environment to unnecessary risks. In addition to the parallels between Alyeska and Enbridge, the under-reported pigging problems on TAPS emerge in this report as a significant red flag warning regarding the current safety of Alyeska's operations.

2. Pump Station 9 Relief Tank Overflow (May 2010)

When emergency power systems failed during the May 25, 2010, power loss at Pump Station 9, 110 miles southeast of Fairbanks, the blackout led to an overflow spill at the pump station's relief tank. Alyeska's internal incident investigation report on that incident was initially withheld from public review. However, the report was provided to this reporter in response to a request under Alaska's sunshine law, a counterpart to federal Freedom of Information Act provisions. In August 2010, this web site released the report to the public and discussed the principal management failures revealed at Pump Station 9 in [The Story of a Troubled Tank](#). Subsequent TAPS events demonstrate the importance of the principal findings from that report and therefore warrant review.

The June 2010 internal incident investigation report on the relief tank overflow at Pump Station 9 four weeks earlier identified two root causes and three contributing causes. According to that report, the root causes of the relief tank overflow were:

- equipment and operating plan design deficiencies; and
- failure to communicate lessons learned from past incidents, despite procedures that are supposed to accomplish this important safety task.

One of the report's three contributing cause – operator lack of situational awareness – related directly to pipeline operations. The other two contributing causes dealt with deficient management practices that included the failure of the company's Safe Operations Committee to meet and inadequate policies, standards, procedures and administrative controls for dealing with abnormal operating conditions. **[3]**

The fundamental management shortcomings revealed at Pump Station 9 in 2010 were surprising in view of this background: Two events at the same station three years earlier – a fire at the station's relief tank in January 2007 and a power blackout at that pump station two months later – helped trigger a line-wide Unified Plan effort that was described by Kevin Hostler, then president of Alyeska, as "a huge, all-encompassing endeavor" aimed at improving operational safety, reliability, integrity management and regulatory compliance on TAPS. **[4]** The 2007-2008 Unified Plan included a "Management Action Plan for Incident Investigation and Root Cause Analysis Process Improvements Initiative;" this part of the Unified Plan was designed to improve Alyeska's ability to learn from experience in order to reduce pipeline risks and was based on the critical findings of an independent consulting firm that studied 21 significant safety problems on TAPS since 2000, including the two 2007 incidents at Pump Station 9. **[5]** (To see Hostler's January 2008 President's Message and an outline of Alyeska's 210-page November 2007 Unified Plan briefing, [click here](#).)

The 2007 Pump Station 9 incident investigation report noted – but did not correct – Alyeska’s programmed blackout response of diverting oil to the pump station relief tank to prevent over-pressuring the mainline pipeline — an emergency response that could result in an overflow spill at the newly-automated pump station. Although this programmed response violated fundamental safety principles, the report concluded that the plan did not warrant change, assuming that remote pipeline operators would have sufficient time to turn off the emergency diversion to the relief tank. **[6]**

The consequences of Alyeska’s 2007 failure to improve incident investigation and follow-through mechanisms were demonstrated three years later, when the May 25, 2010, blackout at the automated station actually caused an overflow at the station’s relief tank. When the 2010 power failure occurred, the remote operators, apparently unaware of the automatic diversion taking place, failed to correct the problem. **[7]** Moreover, the remote pipeline operators and an Alyeska team present at the station that day for the execution of a planned maintenance shutdown (but apparently caught flat-footed by the blackout) failed to recognize the automatic flow diversion until the relief tank overflow from the main line had poured an estimated 2,580 barrels of oil into the storage tank yard. **[8]** If the work team that eventually spotted the overflow had not been present that day, it is not clear how much longer the automatic diversion might have poured oil from TAPS into the tank farm compound at Pump Station 9.

Subsequent events on TAPS, reported below, show similar management shortcomings in two key respects: lack of situational awareness and failure to implement measures to prevent past mistakes in a timely manner. It is interesting to note in this regard that two senior Alyeska officials who approved Alyeska’s report on Pump Station 9 overflow in 2010 were also principal signatories to the unsuccessful 2007 Management Action Plan, adopted three years earlier.. (To see their signatures on the failed 2007 plan to improve incident investigations, and on the 2010 investigation, which found that Alyeska still needs to deal with shortcomings in the company’s mishap follow-ups, [click here.](#))

3. Pump Station 1 Emergency Shutdown (January 2011)

Leaking pipe beneath TAPS Pump Station 1 in January 2011 led to an emergency TAPS shutdown that was portrayed in the national press as a near disaster that might have cut off a major artery for U.S. oil. Here is how Reuters reported that event:

Last week’s shutdown of the Trans Alaska Pipeline System, a major artery for U.S. oil, may signal trouble ahead for Alaska’s aging oil infrastructure, including more frequent incidents that could damage the environment and cause oil prices to soar

Workers braved sub-zero temperatures to install a bypass around a small leak at TAPS, allowing the line that ships 12 percent of domestic crude supplies to restart on Monday, and halting the advance of oil prices toward \$100 a barrel.

But the smooth fix belies an ominous lesson from last week’s near disaster. Officials and experts said shutdowns at TAPS are becoming more likely as declining Alaskan oil output reduces the flow of crude through the line and makes its riskier to operate.

The stakes are highest during Alaska’s dark and cold winter when even minor repairs are precarious, and when idle oil or debris could freeze in the line, potentially wreaking havoc.

"Flow is the real problem," said Thomas Barrett, president of TAPS operator Alyeska, in a phone interview. TAPS' "exposure to cold is increasing with every decline we've had in production."

Last week's spill along the 800-mile (1,280 kilometer) line was measured at just 317 barrels, but it provided a glimpse at how a future winter shutdown might snowball into calamity. . . . **[9]**

To cope with the emergency shutdown at Pump Station 1, the pipeline company re-opened Pump Station 7 in central Alaska to provide additional heat to cold pipeline stretches and, with government approval, conducted a risky restart to enable pig extractions before leaks in concrete-encased piping beneath Pump Station 1 could be located and fixed. **[10]** Piggings problems associated with the 2011 shutdown at Pump Station 1 will be considered in the Section 6, which tells the story of Alyeska's ongoing battle to tame its errant pigs on the 800-mile, 48-inch diameter pipeline that carries roughly 500,000 barrels of crude oil per day..

According to a September 2011 assessment by the State Pipeline Coordinator's Office (SPCO), potential corrosion leaks in piping at Pump Station 1 were identified as potential problem in 2008, but no immediate action was taken. That piping had been encased in concrete nearly two decades earlier and therefore could not be reached easily. Alyeska conducted a risk assessment in 2008 that assigned the highest risk rating (denoted as a "10") to one stretch of buried, corrosion-prone pipe, while a zero-risk rating was assigned to a smaller segment. Instead of tackling the major potential problem first, Alyeska deferred the project, repairing the more accessible, low-risk area first. Three years later, in January 2011, the stretch deemed highest risk, still unrepaired, started leaking. **[11]**

The January 2011 emergency shutdown at Pump Station 1 and relief tank overflow at Pump Station 9 eight months before, share a common denominator: Failure to mitigate identified risks in a timely manner. In this regard, there are striking similarities between Alyeska's recent shutdowns and the Enbridge performance failure in Michigan, as reported by the NTSB. Parallels between Alyeska and Enbridge will be discussed in the following section.

4. TAPS Regulatory Oversight

This section on government monitoring of TAPS opens with an overview of the TAPS federal and state government oversight agencies, **[12]** then looks at the government monitoring effort through the lens of TAPS low throughput and cold restart issues. During TAPS construction, the Army Corps of Engineers was the lead federal oversight agency. After TAPS oil began flowing in 1977, the Interior Department's Bureau of Land Management inherited TAPS oversight from the Corps. The Joint Pipeline Office (JPO), an umbrella group of state and federal agencies, was established in March 1990 "to perpetuate a more formal and effective intergovernmental partnership and achieve a single point of contact for TAPS" and other pipeline operators. **[13]** The coordinated TAPS oversight unit has fragmented somewhat since the state and federal TAPS leases were renewed in November 2002 and January 2003, respectively. An important regulatory development in recent years is the increasing field presence – nationally and on TAPS – of PHMSA, the agency formed out of the Department of Transportation's Office of Pipeline Safety and headed between 2006 and 2008 by Alyeska's current president.

Federal Oversight. The fragmenting of the Alaska JPO **[14]** and the emergence of PHMSA, noted above, play significant roles in TAPS oversight. In recent years, in response to a series of pipeline fatality accidents in the Lower 48 PHMSA has assumed an increasingly important role in pipeline oversight, combining its original enforcement of technical standards with more broadly defined safety concerns and a commendable interest in public outreach. However, this analysis indicates that PHMSA's performance on TAPS is hindered by statutory requirements that are cumbersome and strong resistance from Alyeska, resulting in a slow-moving regulatory process that puts important details of its actions behind a veil of confidentiality.

Noting that the cracks in the Enbridge pipeline that ruptured in 2010 were detected by Enbridge in 2005 but were not excavated and repaired, the NTSB criticized PHMSA's "weak regulation for assessing and repairing crack indications, as well as . . . ineffective oversight of pipeline integrity management programs, control center procedures, and public awareness." [15] .Discussing that criticism, NTSB Chair Hersman also praised the agency for its recent imposition of a \$3.7 million fine against Enbridge for safety violations leading to the spill. [16] It should be noted, however, that PHMSA's Enbridge fine followed the post-spill and investigation and therefore should be regarded as essentially reactionary.

On TAPS PHMSA has recently attempted to ensure pipeline safety in response to the Pump Station 9 and Pump Station 1 emergency shutdowns in 2010 and 2011 without issuing fines through the following actions:

- In the case of the 2010 overflow incident at Pump Station 9, PHMSA issued a Corrective Action Order (CAO), which enumerated specific requirements that Alyeska was required to meet to continue operations. Without making details of the required response actions public, PHMSA closed the CAO on Pump Station 9 in February 2012. [17]
- In February 2011 PHMSA issued a Notice of Proposed Safety Order (NPSO) regarding the leak and shutdown at Pump Station 1, specifying actions to remediate problems that, in PHMSA's view, would lead to unsafe conditions. Despite the fact that the latter action did not impose a fine, Alyeska vigorously opposed PHMSA's administrative action. That safety order is still an open file. However, oversight details are not readily available to the public. [18]

By way of background: PHMSA's no-fine approach on TAPS to the emergency shutdowns at Pump Station 9 and Pump Station 1 in 2010 and 2011 appears to represent a significant strategy change from the agency's previous approach to dealing with Alyeska, as represented by the agency's 2007 assessment of a proposed \$817,000 penalty – the biggest proposed penalty issued against any pipeline operator in 2007 – for a host of performance errors, most of which were blatant safety violations that led to the January 2007 fire at the Pump Station 9 relief tank. [19] Alyeska vigorously resisted the proposed fine in 2007, responding with hundreds of pages of paperwork purporting to show that the company was in compliance with legal requirements. That case wallowed in regulatory limbo for nearly four years before Alyeska settled for a reduced penalty of \$502,253 in 2011. Meanwhile, Alyeska was also steadfastly protesting other significantly smaller fines, including a proposed penalty for a 2004 failure to report in a timely manner on corrosion inspection results. [20]

In five penalty actions against Alyeska initiated between 2007 and 2009, PHMSA issued proposed penalties totalling \$1,198,800. In contrast, since January 2010, PHMSA has proposed one penalty on TAPS for \$41,300. Put otherwise: current reported PHMSA data show a 29:1 ratio between the PHMSA penalty actions proposed against Alyeska during the 2007-2009 period and the 32 months reported for 2010-2012. [21]

PHMSA records also show a striking contrast in reported Alyeska property damage during the same periods. According to PHMSA data, between 2007 and 2009 TAPS incurred less than \$0.5 million in property damage, compared to reported property damage since January 2010 of nearly \$45.0 million. Almost all of the latter-period damage was attributed to Pump Station 9 in 2010 and Pump Station 1 in 2011. [22]

To summarize these data: During the last 32 months, proposed penalties on TAPS amount to less than 1/29th of the 2007-2009 total, while reported property pipeline damage, largely due to the non-penalized accidents of 2010 and 2011, increased 90-fold.

With or without proposed penalty sanctions, the time lag between enforcement actions and their outcomes suggests that PHMSA enforcement actions may not lead to timely field performance

corrections. Moreover, PHMSA's ability to ensure that operators deliver on the promise of safe operations appears to be limited by industry resistance to government oversight. Consider these examples from the public record on PHMSA's implementation of the regulatory framework in response to the January 2011 emergency shutdown at Pump Station 1:

- PHMSA's Feb. 1, 2011 Notice of Proposed Safety Order presented reasons why the agency had determined that eight proposed corrective measures, requiring specific actions within specified timelines, were necessary "to ensure that the public, property, and the environment are protected from the potential risk." On February 15, Alyeska president Tom Barrett fired off a vigorous reply in opposition to the elements of the PHMSA proposed safety order. It would be another six months before PHMSA's consent order would go into effect, setting up requirements for specific field actions – including the delayed design and installation of heating equipment, pig retrieval units and other equipment necessary to ensure safe operations under low flow conditions. [23]
- At the end of March 2011 PHMSA conducted a routine field inspections of Alyeska's procedural manuals and determined that the pipeline company's basic field manuals were not in compliance with the provisions of more than 20 statutory safe pipelining requirements. However, PHMSA did not post the notice of these violations for another 16 months. [24]

As the public record on this regulatory drama very slowly unfolds, the file on Alyeska's performance remains open while substantive information on PHMSA enforcement actions drifts in a flood of paperwork.

State Monitors. On the state side, the principal agency is the State Pipeline Coordinator's Office (SPCO), a unit that originally reported directly to the governor before moving to the Department of Natural Resources. In the SPCO September 2011 assessment of Alyeska's project management at Pump Station 1 summarized in the preceding section, the agency cited statutory and contractual performance requirements and concluded that Alyeska "does not have administrative protocols in place that assure project work is implemented in a manner that is optimal with regards to protecting human health and safety, the environment, and pipeline integrity." Based on this assessment at Pump Station 1, SPCO recommended that Alyeska "review and update business processes, procedures, and practices." The agency also suggested that Alyeska conduct an "examination of how work is prioritized" and "consider revising the PWR (project work request) interface."

In making these recommendations, the agency noted that its assessment echoes the internal recommendations made by Alyeska after the 2010 Pump Station 9 overflow incident. (The agency did not mention that Alyeska's internal 2010 recommendations to improve and follow through on internal investigations also echoed the company's prior management study, triggered by problems at Pump Station 9, three years earlier.) A subsequent SPCO assessment of TAPS right-of-way maintenance systems and programs found that Alyeska has effective maintenance processes that are "acceptable with respect to TAPS right-of-way lease covenants." [25] The apparent dichotomy between these assessments was not explained.

Meanwhile, at the southern end of the pipeline a September 2011 evaluation of Alyeska maintenance practices at the Valdez Marine Terminal (VMT), conducted for the Prince William Sound Regional Citizens Advisory Council by two former Alyeska managers, reviewed five of Alyeska's Reliability Centered Maintenance (RCM) programs and concluded that "Alyeska is not effectively implementing RCM...to develop consistent, efficient and appropriate maintenance strategies." RCM is a management practice developed by the U.S. Navy and applied to TAPS several decades ago. The VMT study found that although none of the five maintenance programs reviewed rose to the level of imminent safety threats,

...Alyeska is struggling with overly complex processes and poorly integrated IT [Information Technology] systems which are adversely impacting their ability to effectively apply Reliably Centered Maintenance. [26]

In light of the growing list of company project management problems and failures to follow through on previous incident investigation reports, observers might find it surprising that the state monitors did not declare Alyeska out of compliance with statutory and/or lease requirements. Instead, SPCO meekly suggested recommendations for improvement.

Cold Restart, Low Throughput and Government Oversight. As designed and built, TAPS was supposed to be able to restart safely after a 21-day winter shutdown at 40 degrees below zero (-40° Fahrenheit). [27] The purpose of the cold restart time window was to allow Alyeska time to fix problems and restart the pipeline during an emergency winter shutdown. Wax and ice traveling with pipeline oil are the principal problems the cold restart requirement deals with. When oil cools within TAPS during a winter shutdown, wax and water tend to separate out. The pipeline may be blocked by wax, which congeals when cooled, and water, which can freeze. In resuming the flow of oil, breaking the resulting blockages may require more pressure than pump stations can deliver, or greater pressure than the pipeline walls can withstand. Additionally, wax buildup in the pipeline renders the pipeline walls more vulnerable to interior corrosion, while ice chunks pushed through the pipeline can damage pumps, valves and other operating equipment. Moreover, an iced-up pipeline stretch can freeze surrounding soil on buried stretches, resulting in frost heave problems. [28]

Current reduced throughput on TAPS challenges the pipeline's cold restart capability in two principal ways: As North Slope production – and, therefore, TAPS throughput – declines, the oil in the pipeline flows more slowly and therefore is increasingly subject to cooling effects. Moreover, oil from smaller fields on the periphery of Prudhoe Bay tends to be thicker and wax prone. [29] Although these are serious operational problems, they are not insurmountable. In addition to removing the impurities before putting the oil into TAPS, increasing pipeline insulation and adding heat to the line would make the oil flow better and reduce wax buildup and icing problems. More frequent pigging can also mitigate cold restart problems. [30] But if pigs fall behind on their tasks – or get stuck pushing heavy loads of wax and ice – their operation could exacerbate or create new cold restart problems. [31]

In late 2002, when the TAPS state and federal leases were renewed after 30 years, these problems were being studied. At that time Alyeska was planning a pipeline makeover known as Strategic Reconfiguration (SR), a massive project that called for the closing of three more pump stations and the automation and conversion to electric power of the five remaining stations. The industry did not want the terms of the lease agreements changed to deal with these issues, and the host governments acquiesced. [32] A brief recap of other significant landmarks in dealing with cold restart issues follows:

- The original TAPS design basis cold restart requirement was compromised in the late 1990's when the pipeline company closed four pump stations that were no longer needed as throughput declined. With oil flowing more slowly at lower throughput and without the heat from these four pump stations, in-line oil temperatures dropped, rendering the pipeline more vulnerable to the Cold Restart difficulties. JPO required a Cold Restart plan by September 1998, but Alyeska missed that deadline. [33]
- In 2003, when Alyeska exacerbated the Cold Restart problem again by authorizing SR, the pipeline company planned SR completion by the end of 2005, but the first renovated pump station – Pump Station 9 – did not enter service until 2007 and in 2012 the final pump station had yet to be completed.) [34]

- In June 2005 JPO acknowledged Alyeska's request to reduce the Cold Restart period, noting the "current engineering judgment that there is now only a minimum of a 14 day shutdown window under arctic winter conditions as opposed to the 21 day 'Original Cold Restart Plan'." JPO asked Alyeska to "address the issues related to repair scenarios which cannot be performed in 14 days." [35]
- In 2007 Alyeska launched a \$10 million study of low throughput and cold temperature problems, scheduled for completion by the end of 2010. [36] (To see an outline of the principal problems, as seen in the early days of Alyeska's Low Flow study, [click here.](#))
- In January 2011 that study was not yet complete when the leak in piping encased in concrete at Pump Station 1 caused the emergency TAPS shutdown. Four days after the start of the emergency shutdown, Alyeska – with government acquiescence – temporarily restarted the pipeline, despite concerns that the restart could increase leakage from concrete-encased pipe at the station. This was not a cold restart; TAPS had not cooled to the point that cold restart procedures were necessary. Alyeska gave two reasons for the temporary restart: delaying pipeline cooling during the shutdown and moving the pigs stuck in the southern section of TAPS to prevent them from becoming a cold restart problem. [37]

Coupled with the relatively light-handed enforcement approaches by state and federal agencies, and the time lag between initiation and resolution of the agency's enforcement action, noted earlier in this section, this review of the evisceration of the TAPS cold restart design requirement serves as an examples of weak government oversight – the fourth Alaskan parallel to the central points of NTSB Chair Hersman's critique of the Enbridge pipeline spill.

5. Promises and Prizes

Prior to the 2010 Enbridge spill in southwest Michigan, Enbridge President and Chief Executive Officer Patrick Daniel issued a promissory statement declaring that "Our goal is to have no accidents and to cause no harm to the environment." To achieve his intent, the Enbridge chief executive pledged that company would work with employees, regulators, industry peers and partners to promote responsible performance, strive for continuous improvement and make health and safety management an integral part of company activities. [38] Despite these promises, when the Michigan rupture occurred in the summer of 2010 the Enbridge pipeline operators first failed to recognize the problem and then made things worse by failing to advise the nearby residents that its pipeline was carrying a blend of heavy, tar-like bitumen crude oil mixed with a lighter diluent. Unleashed from the pipeline, the lighter fractions quickly evaporated from the oil-soaked wetlands, exposing residents to the much more toxic bitumen that remained. [39] Following the Michigan spill, mention of Daniel's "no accidents" pledge in the company's 2009 annual report vanished from the company's annual report the following year; nevertheless, the pledge itself, as posted before the spill, is still available on the company's web site ([click here](#)).

In contrast, Alyeska apparently avoids calling attention to information that might prove embarrassing and does not feel it is necessary to leave potentially embarrassing information on its web site. For example, Alyeska attempted to withhold the 2010 Pump Station 9 overflow incident investigation report from general public review and removed former Alyeska President Hostler's 2008 President's Message on the company's Unified Plan from the company's web site after the Pump Station 9 overflow revealed failure to accomplish stated intentions of the Unified Plan. The removal of this small piece of TAPS history from Alyeska's web site may strike some as inconsistent with the principles of transparency and an open work environment. In any event, this report's review of recent TAPS operational problems indicates that Alyeska's performance continues to suffer from the principal problems identified by review of Alyeska's 2007 and 2010

incident investigation reports – namely, the failures to learn from serious and near-miss events and prevent them by correcting problems in a timely manner.

The Enbridge 2010 annual report continued to display a list of awards and recognition received during the year of the spill. The eleven awards the Canadian company reported receiving in 2010 ranged from ranking 364th on the *Fortune 500* annual listing of America's Largest Corporations (and fifth among the largest pipeline companies) to being named one of "Jantzi-Sustainalytics 50 Most Responsible Corporations in Canada." Explaining the latter award, Enbridge reported that "Jantzi-Sustainalytics evaluates companies based on a wide range of environmental, social and governmental indicators and monitors their performance using its proprietary Best of Sector™ approach." Several honors displayed on the "awards and recognition" page of the Enbridge 2009 annual report did not appear in the 2010 edition. The following were missing from the post-spill annual report listing: an "Environmental Award of Excellence," inclusion among the "Greenest Companies in Canada," ranking among "Canada's 10 Most Admired Corporate Cultures" and inclusion in *Fortune Magazine's* listing of "Most Admired Companies." [40]

Two Alyeska honors recently earned three headlines on the company's web site ([click here](#)). Alyeska's recently celebrated prizes were an award for "Most Improved System for small projects" from Independent Project Analysis (an international consulting firm) and recognition as "one of the 2012 World's Most Ethical Companies by the Ethisphere Institute." The questionable relationships between these prizes and TAPS pipeline operations warrant further attention.

The contrast between the SPCO's September 2011 assessment of Alyeska's serious performance failure in capital project prioritization, discussed above, and Alyeska's award from IPA in April 2012 for operating the "most improved small capital projects program" is noteworthy. According to [Alyeska's news release heralding this award](#), the pipeline company "annually submits a random sampling of projects...for benchmarking" to IPA, "an international industry leader in project management system analysis, whose clients include oil companies, chemical producers, pharmaceutical companies, and mineral and mining companies." The consulting firm then "looks at factors such as whether projects are completed on time, on budget and on schedule." [41] From this description (and from examination of IPA's web site), the award for improved project management on TAPS, which focuses on the cost and scheduling performance of IPA's clients, appears to take precedence over the goal of reducing risks to safe operations.

Alyeska's March 15 press release announcing the Ethisphere award to Alyeska as one of the world's most ethical companies listed two criteria relevant to environmental performance and two criteria related to the interface between the workforce and leadership. [42] Although this award puts Alyeska in good corporate company, the pipeline company's history of troubled worker-management relations and long-term planning failures raise serious questions regarding the basis on which these award criteria were evaluated. The operational problems at Pump Station 9 and Pump Station 1 in 2010 and 2011– as well as information in other articles posted on this web site since 2004 – serve as a reminder of the important distinction between word and deed.

Celebration of company awards can serve multiple purposes that range from polishing the company's public image to encouraging company personnel to set and achieve higher work standards for themselves. These messaging goals are not mutually exclusive. Without judging the primary motivation of company messaging, it can be observed that both Alyeska and Enbridge issue promises and praise prizes in a manner that supports public relations efforts that may be used to counter criticism of company. Moreover, the links between prizes and field performance are tenuous at best, as suggested in this analysis.

Because promises dealing with the future are not demonstrably true or false, the following section explores the following question: Despite Alyeska's history of dubious performance, could this company at last be on the road to living up to its promises? Alyeska's recent pig problems

suggest otherwise. Although two lost pigs in the last two years have drawn little public attention, these recurring mishaps demonstrate that chronic management shortcomings continue to place the 800-mile pipeline at undue risk of crude calamities.

6. Pigs Behaving Badly (Recent Events on TAPS)

Pigs – those widely-used pipeline maintenance tools that travel the pipeline, propelled by the flow of oil, to perform in-line cleaning and inspection tasks – have been used on TAPS since the first year of pipeline operations. While instrument (“smart”) pigs are run every three years to check the pipeline for corrosion and other problems, cleaning or scraper pigs formerly ran at two week intervals. As throughput declines, cleaning pigs are now sent through the pipeline even more frequently to scrape wax from the inner pipeline walls and sweep water and other precipitants from low spots. [43] The importance of pigging to safe pipeline operations was made clear in September 2006 by Tom Barrett, then Administrator of PHMSA, in his 2006 testimony before Congress on BP’s pipeline spills at Prudhoe Bay: Barrett told legislators that running cleaning and inspection pigs was the first requirement in the PHMSA 2006 North Slope corrective action order spelling out the terms BP was required to meet. Further underscoring the importance of pigs, Barrett’s 2006 testimony contained more than a dozen separate references to pigging operations. [44]

Managing pig operations on TAPS has been a recognized, intermittent problem on TAPS for many years, as demonstrated by the following selected examples from the annals of North Slope and TAPS pigging incidents:

In 2000 two cleaning pigs got into trouble in separate incidents. One cleaning pig, clearing the way for a smart pig, dislodged an improperly mounted seating ring from a check valve near Fairbanks, carried it a short distance before leaving it for the following smart pig, which carried the heavy steel ring all the way to Valdez. That event prompted JPO to recommend that Alyeska consider installing a pig receiver and launcher at Pump Station 9 “to minimize the impact on valves due to pigging.” In May 2012 another errant cleaning pig got away from the TAPS personnel at the Valdez Marine Terminal and wound up stuck in the maze of back pressure valves at the terminal’s East Metering Building – the same area where the latest lost cleaning pig landed. [45]

The importance of pig work was also evident in 2006, when corrosion leaks on the North Slope temporarily shut down oil production at Prudhoe Bay. Investigators determined that BP had failed to run an inspection pig through the corroded North Slope pipe for eight years. At that time, Alyeska President Kevin Hostler assured a congressional hearing in Washington that he had proactively initiated a smart pig inspection of TAPS pipeline condition one year early. However, that smart pig TAPS check-up was not able to produce results south of Pump Station 4 due to wax buildup in the pipeline. While Alyeska was trying to remove wax to complete the inspection on the long southern stretch, an unsuccessful cleaning pig disintegrated when it was pushed into a protective strainer at Pump Station 7, triggering a search for missing parts. These events called attention to the absence of pig launching and retrieval units in the southern two-thirds of the pipeline and, more generally, to the important distinction between promise and practice. [46]

In January 2009, a pig operated on the North Slope by BP was approaching TAPS Pump Station 1 when it got stuck. The natural gas pushing the stalled pig went around it and poured into Pump Station 1. Fortunately, favorable wind conditions prevailed at the time, averting a disastrous fire or explosion. A report on Alaska operations by an independent panel of the National Research Council’s Transportation Research Board later cited this near-miss event as an important example of safety risks due to poor communications among operating entities. [47]

In the last two years, two recent lost pig incidents on TAPS have received relatively little public attention. The pig lost two years ago was virtually unnoticed by the press, while this year's lost pig was belatedly and superficially reported four months after the fact. In addition, two other pigs, without getting lost, were trapped in the January 2011 emergency shutdown, requiring a risky restart that demonstrated the potential for problems associated with pigging during and after a winter pipeline shutdown. Review of these incidents indicates the threat of pigging problems to pipeline safety and shows that TAPS regulators have been rather quiescent in dealing with Alyeska's consistent failure to institute practical measures in a timely manner to mitigate those problems. Alyeska's recent pigging problems will be discussed in chronological order.

November 2010 Lost Pig (Pump Station 5). Even if Alyeska had not announced on November 16, 2010 that the TAPS owners were naming Tom Barrett to take over as Alyeska's new president at the start of the next year, [48] the routine launching of a cleaning pig from Pump Station 4 in the Brooks Range on that day would not have made news. But that pig became newsworthy two days later, as TAPS operators ordered an emergency shutdown in response to a spill report from a military overflight that turned out to be a false alarm. The pipeliners apparently stopped the oil flow without realizing that they were putting the cleaning pig, launched two days earlier, at risk as it approached Pump Station 5, the pressure relief station that protects the south flank of the mountain range. The emergency shutdown caused pressure relief valves at Pump Station 5 to open automatically; the pipeline pressure changes pulled the pig backward into the smaller diameter discharge relief piping, where damaged pig parts were found blocking the relief line one week later. The largest relief tank on the pipeline was temporarily out of commission. [49]

On the day of that shutdown, the company's communications shop sent out an e-mail "Keeping You Posted" (KYP) notice to all Alyeska employees thanking "everyone who mobilized quickly and took part in Alyeska's response" to the emergency false alarm "Our groundcrews displayed the utmost professionalism," Alyeska Acting President Greg Jones declared in the e-mail notice, adding that "countless others responded in offices across the system, in the FEOC [Fairbanks Emergency Operations Center] and as part of the Crisis Management Team." [50] When the announcement praising the emergency performance was sent out, the KYP did not mention (and Alyeska management may not have known) that the pig had gone missing somewhere south of Pump Station 4. In light of Alyeska's history of pig problems, it is surprising that the pipeline operators failed to determine the whereabouts of the pig last seen at Pump Station 4 before they ordered the Nov. 18, 2010 emergency shutdown.

While Alyeska's official KYP notice was praising staff performance during the Nov. 18, 2010 shutdown, troubling questions about the lost pig were making the rounds among veteran TAPS observers. Some TAPS watchers noted that the rapid shutdown demonstrated a lack of situational awareness – an operating shortcoming identified five months earlier as a significant causal factor in the Pump Station 9 relief tank overflow incident, discussed above. An experienced Alyeska field worker who called this writer's attention to the November 2010 lost pig event wondered what had become of Alyeska's promises – made in the aftermath of the May 25, 2010 overflow incident at Pump Station 9 – to make sure that Alyeska personnel improved their situational awareness in the management of their operations. [51]

In response to this writer's follow-up request for information about the events of Nov. 18, 2010, state oversight officials echoed Alyeska's praise for its rapid shutdown. This informal endorsement of Alyeska's performance by state officials ignored the fact that Alyeska operators, in losing track of the pig, did not appear to have learned from the company's past pig mishaps and had not yet fulfilled previous promises to improve pipeline safety by assuring situational awareness.

The November 2010 lost pig incident did not receive press attention, but the SPCO's subsequent annual reports reveal that the lost pig wound up in pressure relief system piping, causing extensive damage. According to agency's next two annual reports, temporary by-pass piping was installed and relief tank operating levels were reduced until the major project work to replace the damaged pressure relief piping blocked by the lost pig was completed in 2012. [52] (For a picture of the damaged scraper pig lodged in discharge pressure relief piping at Pump Station 5, released by the SPCO two years later, [click here](#).)

The Cold Pigs of January 2011. As discussed in Section 4, two pigs that didn't get lost still managed to play a significant role in the January 2011 emergency shutdown at Pump Station 1. During the shutdown to deal with the leak at the northernmost TAPS pump station, those two pigs were trapped in the southern stretches of the pipeline. The SPCO reported that the decision to allow the restart after a four-day shutdown in January 2011 "was driven by the regulators' uncertainty of whether or not APSC could restart the pipeline in cold weather conditions after an extended shutdown." The agency explained that during a pipeline shutdown

. . . excessive wax and solids can accumulate; the cleaning pigs push contaminants and can create a 'debris cloud' that settles when a pig's movement is interrupted. If a pig cannot resume movement, it can affect the flow of crude through the pipe and potentially stop other pigs. . . . Although APSC [Alyeska] was able to recover both pigs without incident, the situation highlighted the potential for problems associated with pipeline pigging during and after a cold restart scenario.

In sum, SPCO agreed that the risks of increasing the relatively small quantity of leaking oil at Pump Station 1 were outweighed by the possibility of "far worse problems associated with ice formation in the pipeline had the shutdown continued." [53]

The SPCO account of the pig problems associated with the January 2011 shutdown did not mention the difficulties associated with the fact that Alyeska had been operating TAPS without a pig receiver – a unit with a specially-built hatch that could be opened to remove a pig and whatever it was pushing – in the 656 miles of mainline pipe between Pump Station 4 and Valdez. (Pump Station 10 originally had a pig receiver unit, but that station was retired in 1996 and the receiver had not been replaced.) The temporary restart during the January 2011 emergency shutdown moved the northernmost stuck pig to a recently constructed section of by-pass piping at former Pump Station 8, where the pig was extracted in an operation that knowledgeable observers described as backwoods pipeline surgery. The emergency pig removal involved closing and opening valves to divert the pig into the new by-pass piping, isolating the by-pass from the main line, cutting open that stretch of pipe to remove the pig and the accumulation it was pushing, then re-assembling the by-pass. [54] The leading or southernmost pig trapped in the January 2011 shutdown made it to Valdez, where it was retrieved at the pipeline terminal's pig receiving facility.

The by-pass stretch used for the emergency pig recovery in January 2011 was built in 2009 for the installation of a new launching unit for smart pigs. As noted at the start of this section, Alyeska recognized the need for a pig launcher between Pump Station 4 and Valdez in 2006, when the pipeline company heralded the smart pig run before Congress that turned out to be a failure due to wax accumulation problems. In 2009, when that launcher was installed with new by-pass piping at the site of former Pump Station 8, Alyeska was still trying to make up its mind where to put a pig receiver. The pipeline company's long-awaited low-flow impact study – a \$10 million project begun in 2007 and released in June 2011 – finally recommended "installing a pig launcher and receiver at PS09 or other locations having the capacity to handle ice and wax before mainline units are affected." [55] Two months later, in the August 2011 PHMSA Consent Agreement Alyeska signed after initial objection and extended negotiations over various issues, the pipeline company formally committed to the federal government its plans to build additional pig launching and receiving units between Pump Stations 5 and 10. [56]

Alyeska's delays in implementing measures to provide additional heat to cold stretches of the pipeline also contributed to turning the January 2011 shutdown into an emergency situation. Pump Station 7, situated in interior Alaska between the Yukon River and Fairbanks, had been placed in "caretaker" and emergency standby status in March 2008 and scheduled for permanent rampdown in 2010 but was re-opened temporarily on a emergency basis to provide heat for stalled pipeline oil during the January 2011 shutdown. [57] In the wake of Alyeska's January 2011 emergency, the pipeline company has also decided to permanently re-activate Pump Station 7 as "part of Alyeska's cold restart contingency plan, providing a means to inject heat into the pipeline during a protracted and unexpected pipeline shutdown." [58]

Despite Alyeska's history of delayed decisions dealing with pig launch and receiving units and low throughput issues, in his letter of Feb. 15, 2011 in opposition to PHMSA's proposed safety order Tom Barrett questioned PHMSA's statement that "the only permanent pig receiver that could have been used to remove the pigs from the [southern portion of the] pipeline was located at the Valdez Terminal." According to Barrett, "Alyeska has a spool piece of pipe that can be, and was, successfully and safely used to capture the pig at PS 8. Alyeska just demonstrated that a permanent pig receiver is not the only method capable of safely recovering pigs." [59] (To see a picture of that site, [click here.](#)) Removing a pig from a stretch of pipe without a built-for-purpose pig handling unit, advanced planning and written procedures is not likely to be as safe as it would be to remove that pig in a warm building, using a specially designed, pre-installed unit (especially necessary in mid-winter in remote reaches of central Alaska).

At the end of March 2011 PHMSA conducted a routine field inspections of Alyeska's basic field manuals and determined that the pipeline company's operating guidelines were not in compliance with the provisions of more than 20 statutory safe pipelining requirements. One finding that PHMSA posted in August 2012 from the inspection of field manuals was that Alyeska's basic operating manual "does not reference for procedures for receiving and launching pigs from Pump Station 8 in a safe manner." According to the PHMSA filing, although pig launchers and receivers must be equipped with a device capable of safely relieving pressure prior to insertion or removal, the Alyeska operations manual is silent on this subject. [60] Consequently, the pig retrieval Barrett bragged about at Pump Station 8 during the January 2011 emergency may have been conducted in violation of federal pig handling requirements under CFR §195.426.

Barrett objected to what he termed the agency's "vague generalization" that "reduced throughput has resulted in numerous integrity challenges that have not been fully addressed by Alyeska's operational and maintenance activities." Here are some of the excerpts from Barrett's vigorous rejoinder to that statement:

"Alyeska has been, and will be proactive to address risks resulting from declining flow. . . . Alyeska has increased the frequency and aggressiveness of our cleaning pigs Our pigging program exceeds regulatory requirements. We have implemented multiple changes in operations as a result of studies conducted of low flow conditions and will continue to prudently do so as we reassess our risk mitigation." [61]

If Barrett's characterizations of Alyeska's pig management practices were accurate, it is unlikely that the following event would have occurred.

May 2012 Lost Pig (Valdez). The most recent lost pig episode took place during the second week of May 2012, when a pig quietly and somewhat mysteriously got away from the pipeline operators. Like the November 2010 lost pig incident, the latest cleaning pig that went astray landed in pressure relief piping. This time, the pig got stuck at the Valdez Marine Terminal, not far from the nearby pig receiving unit. Alyeska lost a pig at the same site back in 2000.

Four days after workers discovered that the pig was missing, Alyeska dutifully issued another KYP notice to all employees about the most recent lost pig that showed up at the East Metering Building of the Valdez Marine Terminal (VMT). That message told workers that “As the pig arrived, 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.” The next day, a terse follow-up KYP message advised that missing pig parts had been located in a section of removed relief system piping. According to that notice, normal operations had not been restored, but the system was “locked into a safe flow configuration,” and that “[t]here have been no injuries or shutdowns as a result of this event.” **[62]**

Four months and one week after the May 2012 lost pig event, the *Petroleum News* reported on the incident in its September 23 weekly edition. The article appears to have been based on the May 14 KYP notice and a briefing prepared by the Prince William Sound Regional Citizens Advisory Council (PWSRCAC) staff in anticipation of an Alyeska presentation scheduled for the council’s quarterly meeting in September. The previously silent pig was starting to squeal from its grave in the Valdez pressure relief system, but the article overlooked background facts. Moreover, the causes of the problem and the lessons to be learned from this event were not clear. According to *Petroleum News*, the pig arrived in Valdez on schedule, but then “something happened to divert the pig’s path.” The resulting search for the missing pig “determined that the pig had followed the oil on a ‘path of least resistance’” until it got stuck, with broken pig parts blocking relief system piping. **[63]**

The *Petroleum News* article repeated Alyeska’s KYP message four months earlier, blaming the latest TAPS pig loss on the wax cloud the pig had scraped up and was pushing to Valdez. Since pigs normally move through the pipeline by following the “path of least resistance,” the article failed to explain why the pig wound up in the relief system piping.

At the PWSRCAC briefing in Seward Sept. 20, Scott Hicks, Alyeska’s director of operations at the VMT, provided more detailed information. However, the information he provided was lacking in significant respects and his presentation raised more questions than it answered. Hicks stated that “we had no indication of any kind of an abnormal wax cloud preceding this particular pig.” Nevertheless, Hicks still blamed the pig problem on the wax-build-up the pig was scraping and pushing to Valdez. He said that the wax in the system created “a rate of rise fast enough that it opened the relief valves,” and the pig happened to be in “just the right place” to get sucked into the Valdez pressure relief system. **[64]**

Hicks raised another question that warrants follow-up when he noted that “we had a normal signal indicating that it [the pig] had arrived” on May 8. However, he added, when workers, opened the receiving unit after the standard, two-day waiting period, the pig wasn’t there. Asked about the reason for the erroneous message, Hicks said that pigs occasionally give false signals and he believed wax may have caused that problem. But he did not explain exactly how the wax interfered with routine communications.

Before Hicks spoke, RCAC apologized to folks participating on-line and telephonically for the fact that Alyeska regarded figures and illustrations Hicks was using as “sensitive” and did not make electronic copies available. Also unexplained was the answer to this question: When an industry-distributed pipeline account written in 1977 noted that the chilling of 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,” **[65]** how did it happen that Alyeska, currently celebrating its 35th anniversary, failed to address this long-recognized problem?

Alyeska’s public reliance on the “wax cloud” theory has enabled pipeline company officials to claim management success while ducking consideration of troubling questions. **[66]** For example, with cleaning pigs currently running on a frequent basis, Alyeska has yet to explain why the wax

cloud that a pig normally pushes might have caused the pig to be diverted into relief pressure piping at Valdez last May. Moreover, Alyeska's stinginess with public information combines with the wax cloud theory deflect public attention from the pipeline company's apparent continued failure to learn from past mistakes and take action to improve pig management practices.

Also unnoticed by the press this time around was the ironic fact that Alyeska's most recent lost pig in May wound up at the nearby Valdez pressure relief system where Alyeska found a lost pig twelve years ago. The backpressure system where these pigs landed was installed in 1997 to stop the pipeline from shaking violently and damaging itself as oil plummeted down the steepest grade on TAPS, from the 2,812-foot summit of Thompson Pass, heading toward sea level at Valdez, less than 27 miles away. As pipeline throughput declined from 2.0 million barrels per day in 1988 to approximately 1.4 million barrels in 1996, vapor pockets began to form on the steep Thompson Pass descent. Where the pipeline leveled out at the bottom of the pass, the pressure increased and the vapor pockets suddenly collapsed with violent, booming implosions. The backpressure system was designed to restrict the incoming oil flow at Valdez through the installation of a series of valves that could be closed as needed to increase pressure on the oil coming down from the pass, preventing vapor pockets from forming during the descent. **[67]**

The 2000 lost pig at the VMT occurred as the TAPS operators tried to deal with two pigs that arrived at the Valdez receiving unit at the same time. According to a JPO report on this incident, a valve was closed erroneously, causing one pig to divert into the smaller piping of the pressure relief system, where it got stuck. JPO's report was accompanied by a [photograph of the errant pig](#), which wound up stuck in the maze of pressure relief valves at the terminal's East Metering Building, its red rubber scrapers poking ignominiously through a small opening. Chalking the incident up to human error as the operators struggled to deal with two pigs that landed at the receiving unit at the same time in 2000, JPO concluded that the pipeline monitors were "satisfied that Alyeska has taken adequate steps to prevent this incident from repeating." **[68]**

While the 2000 lost pig incident at the same Valdez site calls attention to the importance of correcting operator errors, in considering the most recent lost pig incident it is important to note that since 2000 Alyeska has installed an automated control system to govern TAPS oil flow for most of the pipeline. With this background in mind, the search for causes should extend to consideration of the adequacy of the automated pipeline control system and the interface between that system and pipeline operators, as well as human error. The relatively unnoticed lost pig of November 2010 at Pump Station 5 and the May 2012 lost pig at Valdez – both of which wound up in pressure relief system piping – suggests the importance of the following questions regarding the recent, uncelebrated lost pigs on TAPS:

- Did Alyeska's latest lost pig incident result from operator error, functional failure of the automated pipeline control system, poor interface between the pipeline operators and the automated system or other factors?
- Were the causes of the second loss of a pipeline cleaning pig on TAPS in less than three years similar to the causes of the first lost pig?
- If the May 2012 Valdez pig loss was once again caused by operator error, is putting more oil in the pipeline really the correct solution to TAPS pigging problems, or should Alyeska focus on giving TAPS operators better training on practices to keep pigs from getting lost?
- If the current TAPS oil flow management facilities and procedures cannot handle the wax cloud pushed by cleaning pigs, has Alyeska, by closing pump stations and automating pipeline controls created an operating system that is inherently incapable of handling its necessary tasks?

In addition to Alyeska's difficulties managing automated control systems, issues discussed in this section on TAPS pig management – the shrinking of the original 21-day cold restart window, Alyeska's recent history of pigging problems and the delays and the off-again, on-again status of pump station fixes as Alyeska copes with problems created by the closing of half of the pipeline pump stations for economic reasons since 1996 – call attention to the importance of understanding Alyeska's pig history. The limited public information Alyeska has shared with the public on pigging problems – consider, for example, the terse KYP notices on both recent lost pigs – appears to be designed to avoid consideration of these troubling questions. While considering Alyeska's limited release of information through KYP communiqués to workers, it should be noted that in the 2010 KYP notice on the Pump Station 9 shutdown that led to the relief tank overflow investigation similarly deflected attention from the cause of that emergency by omitting reference to the investigation's unsuccessful search for the physical cause of the blackout at that automated pump station. [69]

A paradox underlies the suite of questions reviewed in this section about Alyeska's problems with pigs: When the TAPS owners have sounded the consistent, shrill warning that low throughput could lead to premature shutdown of the pipeline and pig problems are frequently cited as the harbinger of this impending doom, what explains the pipeline company's reticence to discuss its pigging problems? A possible answer is that Alyeska fears that detailed discussion of its pigging problems might backfire by revealing the embarrassing management failures and self-inflicted wounds. Whether or not this is the case, this review of the latest lost pig episode suggests that Alyeska, by failing once again to learn from experience, has also failed to implement safe operating practices.

7. Conclusion: Alyeska Under President Tom Barrett

From the day he was named president of Alyeska, Tom Barrett's reign at Alyeska has been intertwined with pigs, those large, bullet-nosed maintenance tools that pipeline operators send through the line, propelled by the flow of oil, to perform internal cleaning and inspection tasks. This report has documented the following three of Alyeska's recent problems with pigs:

- On Nov. 16, 2011 – the day that his presidency was announced – a pig was launched from Pump Station 4 in the Brooks Range. Two days later that pig, apparently unnoticed by the TAPS operators, disappeared into pressure relief piping system at Pump Station 5 during a brief emergency shutdown. Before it was recovered, that large, bullet-shaped in-line cleaning device, damaged and uncelebrated, had become Alyeska's first lost pig in recent years.
- At the start of his second week in office, in January 2011, another emergency TAPS shutdown occurred, this time at Pump Station 1. During that prolonged winter shutdown, the pipeline had to be restarted to rescue two pigs stranded in the southern stretches of TAPS. Barrett staunchly defends that pig rescue mission, but he and government regulators from PHMSA – the agency he formerly headed – are still arguing about it.
- During May 2012, the seventeenth month of Barrett's tenure, another pig got away from TAPS operators and went missing. Like the previous lost pig, this one was recovered, damaged, in relief pressure piping – this time at Valdez.

To some observers, the history of these pig events suggests a lack of adequate preparation and planning for emergency response actions. In any event, the story of the second lost pig in two years casts a dark shadow on the image the company attempts to paint of itself as a reliable pipeline operator ([click here](#)).

Since Barrett took over at Alyeska, two other troubling trends have been identified. As noted in preceding sections of this report:

- Alyeska appears to be taking aggressive legal action against government oversight, as evidenced by resistance not only to proposed fines, but also to the oversight letters that deal with operating problems but do not call for economic sanctions.
- Alyeska has avoided calling press attention to operational problems that might prove embarrassing, while removing past on-line disclosures of information from its web site, perhaps for similar reasons.

The recent, recurrent TAPS pig problems discussed in this report also serve as an important warning flag that underscores the importance of the parallels between recent events on TAPS and shortcomings on the Enbridge, Line 6B that, according to National Transportation Safety Board Chair Deborah Hersman, led to the oil spill near Battle Creek, Michigan.

In comparing Enbridge and Alyeska, it should be noted that these pipeline operators are business entities with very different organizational structures. Enbridge is a publicly-held, Canada-based corporation that operates far-flung networks of oil and natural gas pipelines in Canada and the United States. [70] Alyeska, which is privately held, was created by oil companies to build and operate one pipeline – TAPS. It should be noted in this regard that three major oil companies that own 95% of Alyeska – British Petroleum (46.9%), ConocoPhillips (28.3%) and ExxonMobil (20.3%) – have controlled a roughly similar percentage of Alaska North Slope oil production for many years and are in the process of acquiring the remaining 5% of TAPS. [71]

The effects of Alyeska's unusual economic structure on TAPS work force behavior are noteworthy. For most of the pipeline's life, three companies have owned more than 90 percent of the pipeline while producing a roughly similar share of North Slope oil. This economic arrangement has given the TAPS owners unusual economic clout and insulation from the critical observations of workers who might question cost-cutting practices. Among these factors:

- High labor and transportation costs to bring oil out of the ground from Alaska and transport it to market encourage oil industry cost-cutting practices, whether necessary or not.
- Limited opportunity for other high-paying jobs in this remote and sparsely-populated state tends to mute concerns expressed by workers who might otherwise challenge cost-cutting on environmental spending that the major TAPS owners apply to TAPS.

These circumstances expose Alyeska workers – and the pipeline – to the cost-cutting demands of the pipeline owners that may be dictated without first-hand knowledge of conditions in Alaska and without regard for the increased risks resulting from the erosion of critical margins of safety that are supposed to protect the land and the waterways that the 800-mile Alyeska pipeline crosses with its market-bound crude oil cargo. (For an example of TAPS owner cost-cutting pressures on its pipeline subsidiary, [click here](#).) Although Barrett claims independence from the TAPS owners as the first Alyeska president who does not come from one of the owner companies, it is by no means clear that he is immune to these considerations.

As the administrator of PHMSA in 2006, Tom Barrett appeared to recognize that the attitudes and behavior patterned in company culture can play important roles in determining how current TAPS issues are resolved. In November 2006, two months after his congressional testimony on BP's North Slope failures, Barrett was discussing his agency's efforts to establish a national data base on pipeline incidents that could serve as a rational basis for evaluating pipeline safety policies and company performance at a pipeline safety conference. Near the conclusion of his remarks, Barrett paused to note that data were not the only factor to consider regarding pipeline safety. If

the responsible people are not motivated by a passion for safety, he told the conference, a company can go by the book but still have accidents. Drawing on his experience as a former Commandant of the Coast Guard's Alaska District, he offered the TAPS Valdez Marine Terminal as an example of a pipeline site that fulfilled safety requirements on paper but still suffered near-miss incidents. The problem, he explained, was that technically proficient field personnel lacked motivation to identify grounding problems that could cause sparks leading to fires or explosions at the terminal. [72] The following year, Barrett's federal agency hit Alyeska with the biggest proposed penalty issued against any pipeline operator in 2007 – \$817,000 – for a host of performance errors, most of which were blatant safety violations that led to the January 2007 fire at the Pump Station 9 relief tank.

Four years later, when the TAPS owners named Barrett to take over Alyeska, some informed observers (including this writer) hoped Alyeska's new president would improve the company's attitudes toward safety and environmental issues. During Barrett's first days at Alyeska, despite his unqualified praise for his company it was still possible to believe that it was too early to evaluate his performance. After all, the new Alyeska president had only been on the job for a week when the January 2011 spill and shutdown occurred. During the spring of 2011, Barrett fans speculated that he might have been trying to strengthen his management base in order to reform Alyeska's culture and management system. However, in the aftermath of the January 2011 leak at Pump Station 1, hopes that Barrett would fix problems at Alyeska began to fade.

In contrast to his approach as a regulator in 2006, as the new president of Alyeska in 2011 Barrett seemed disinclined to discuss whether the emergency shutdown at Pump Station 1 was the result of the pipeline company's failure to identify and fix its problems in a timely manner. Instead of taking a critical look at his company's planning and emergency response shortcomings, Barrett's testimony to the state House Finance Committee and his subsequent remarks uniformly celebrated Alyeska's performance as he called for more North Slope production to ease TAPS operational problems.

Two interchanges with state legislators during his March 2011 testimony confirmed that Alyeska's new president had little interest in re-examining the operating history of the company he had recently taken over. Barrett spoke of the January 2011 emergency shutdown at Pump Station 1 as the result of a "perfect storm" and "a wake-up call for Alyeska" – an incident that was successfully managed, "in large part because of the dedication and talent, commitment and ingenuity of Alyeska [and] our contractors." In response to Barrett's declared admiration for the way in which Alyeska employees dealt with the emergency shutdown, Representative Mike Doogan asked Barrett why, since Alyeska had recognized low-throughput problems as early as 1989, it took so long to deal with those issues, Barrett shrugged off the question by responding that he was not there at the time and did not know. Doogan followed up by saying that he thought Alyeska "was rather late to the party" because the pipeline company had recognized the potential problems but apparently failed to figure out what to do about them. In response Barrett said, "I think you have to begin where you are." From this perspective, he said he was "very proud of our employees" for what he called the company's "extraordinary effort" to deal with the January 2011 emergency. In his brief, prepared remarks and the extended question and answer session that followed, Barrett exhibited rhetorical skills but showed little interest in re-examining and correcting problems in the TAPS management system. [73]

Barrett's unwillingness to look critically at the operations of the company he now heads was evident in his response to another question posed during the March 2011 hearing. When asked about oil spill contingency plans, the Alyeska's president responded with this general observation:

"This is all about risk management. It's driving that number down, as close to zero. I want to be honest to you there is no 'perfect.' You know, this was a great quote after the Super Bowl, out of Vince Lombardi when he took over at the Green Bay Packers, which I

sent it to all our employees, by the way: "We're going to chase perfection knowing full well we will not catch it, but in chasing it we will catch excellence." [74]

Because he is not inclined to look at Alyeska's operations and history, Barrett may not have been aware that he was not the first Alyeska president to chase excellence. In 1997 Bob Malone, then president of Alyeska, designated the year 2000 as Alyeska's target for achieving excellence on TAPS. Malone's failure to accomplish his goal was captured in a [suite of photographs from the year 2000](#) that appeared on the inside back cover of a report this writer prepared in 2002. These photographs included a TAPS near-miss due to grounding problems at the Valdez Marine Terminal (an example of the problem to which Barrett also referred to in his remarks at the 2006 Pipeline Safety Trust conference, discussed earlier in this section).

Instead of borrowing phrases from Vince Lombardi, Barrett might have employed some of the aphorisms of former New York Yankees catcher Yogi Berra, whose cleverly mangled observations often seemed to apply to Alyeska. For example, Berra once famously said:

"This is like déjà-vu all over again." [75]

Berra was referring to watching his slugging team-mates Mickey Mantle and Roger Maris hit back-to-back home runs during the summer of 1961, when Maris broke Babe Ruth's long-standing home run record. However, the colorful Yankee catcher's observation might have applied the similarity between Alyeska's mishaps and investigation at Pump Station 9 in 2007 and the 2010 overflow incident at the same station's relief tank.

Berra also coined a phrase that seems to fit Barrett's professional biography when the Yankee catcher said:

"If you come to a fork in the road, take it!" [76]

In the early months of his Alyeska presidency, Barrett was clearly on a new road as he called for putting more oil into TAPS to solve the pipeline company's operational problems. At a meeting in June 2011, when asked about the economic factors indicating that high oil prices already gave the TAPS producer-owners the incentive to solve low throughput problems, Barrett told this writer that as Alyeska president his main concern was operational safety and his focus did not include economics. [77]

From the standpoint of economics two recent Alaska Superior Court decisions on TAPS property tax valuation call Barrett's conclusions regarding the need for more production into question. The first court decision, which preceded the January 2011 shutdown and Barrett's plea for more oil in TAPS, dealt with the TAPS property tax assessment value for 2006. In her May 2010 initial decision on that case, Alaska Superior Court Judge Sharon L. Gleason found that existing North Slope reserves at high oil prices prevailing in recent years provide incentive for the major TAPS owners, who also control a roughly similar share of North Slope petroleum, to keep North Slope oil flowing. After reviewing extensive testimony on a variety of issues that included low throughput, Judge Gleason also found that with approximately five billion barrels in North Slope reserves remaining to be produced at \$70 per barrel at (the approximate 2006 oil price), TAPS was a necessary conduit to bring a commodity worth \$350 billion to market. Therefore, she concluded, if the 48-inch diameter TAPS were unable to handle the cold, slow flow problems the producer-owners would be willing to spend significant sums of money to resolve TAPS low flow problems by heating the oil to continue production for at least several decades, until North Slope production and TAPS throughput fell below 200,000 bpd. In light of the role played by TAPS in bringing this valuable commodity to market, she concluded that the TAPS producer-owners could spend as much as \$18 billion -- the estimated cost of building a smaller replacement pipeline -- to solve the problems necessary to keep TAPS running. Based on review of conflicting testimony on TAPS low throughput issues, she adopted the view of expert analysts that cold oil problems on

TAPS can be largely alleviated by the simple expedient of adding heat to the pipeline. After considering industry objections, she issued a virtually identical final finding in October 2010, several months before Tom Barrett's March 2011 plea for more oil in TAPS. **[78]**

Without reference to Judge Gleason's first property tax valuation decision, Alyeska's Low Flow Impact Study final report, released in June 2011, concluded that the minimum reliable operating throughput for TAPS was approximately 350,000 bpd, given unspecified future capital outlays to deal with cold flow problems. According to the three-year, \$10 million report, "[m]easures to mitigate these issues . . . at throughputs below 350,000 BPD have not been determined." **[79]** Alyeska's higher minimum safe throughput figure suggested that without instituting measures to put more oil in TAPS, the pipeline would be in danger of imminent shutdown.

During 2011, the TAPS property tax base and taxation rates for 2007, 2008 and 2009 were once again at issue in Judge Gleason's court in a consolidated follow-up court property tax valuation case. The TAPS owners proffered Alyeska's Low Flow impact study; Judge Gleason, after reviewing the arguments and taking extensive testimony from expert witnesses, once again rejected Alyeska's arguments. Her second decision, issued on Dec. 30, 2011, was issued as she departed the Alaska court system to take a seat on the federal bench.

An important disclosure in Judge Gleason's second TAPS property tax case was a 2005 BP report that placed minimum TAPS throughput at 135,000 bpd. One company analyst wrote, "Our consultant thinks we can probably operate TAPS below this minimum rate." Citing these and other statements of BP analysts to the same effect in her second court decision on TAPS property valuation case, Judge Gleason concluded that it would be economical for the TAPS owners to apply mitigating measures to enable TAPS to operate at 100,000 bpd or less – a 50 percent reduction from her 2006 finding. She noted that BP "failed to provide" the 2005 report for the prior case, adding that this omission may have caused her to over-estimate the minimum TAPS throughput in her prior finding on the valuation for TAPS in 2006. **[80]**

Having declared economic issues out of bounds, Barrett did not have to deal with Judge Gleason's flat rejection of the arguments of the Alyeska Low Flow study group leader Pat McDevitt. Although McDevitt had accompanied Barrett to Juneau to testify in March 2011 and had received Barrett's praise for a job well done, Judge Gleason found McDevitt's opinions did not stand up against the testimony of opposing experts, including BP specialists who reported in 2010 on the economic feasibility of heating TAPS to mitigate risks associated with low throughput. She wrote that McDevitt "testified that it is 'not possible' for TAPS to operate below 300,000 bbl/d," but "this Court found that testimony, when considered with all of the other evidence at trial presented on this topic, to be completely unpersuasive." **[81]**

In addition to ignoring the economic challenges to his position, it appears that Barrett is not focused on the tough management questions necessary to improving Alyeska's performance. The Alyeska president still talks about pipeline safety, but in a recent briefing for this reporter he seemed more interested in praising Alyeska's prizes and accomplishments than in discussing the company's operational problems, pipeline company history or the chronic, cost-cutting pressures that chronically impair the pipeline company's field performance. **[82]**

Analysis of TAPS pig problems documented in this report points to the conclusion that Alyeska's management system under President Barrett continues to be plagued by serious shortcomings. Where President Barrett calls for more oil in TAPS to relieve pig problems, the fact that Alyeska continues to lose track of its pigs suggests a simpler solution: Better management training. Although Barrett declines to look at TAPS history, this review of past pig problems reveals that pig difficulties could have been anticipated and might have been ameliorated by the simple expedient of adding heat to the pipeline. Moreover, lack of public attention to the events

discussed in this report spares Barrett from dealing publicly with the challenges of basic operational questions that include the following:

- Is Alyeska leveling with the public on significant incidents? As noted in the preceding section, these days Alaska's best known pipeline company often seems to be trying to obscure and restrict information on pipeline problems.
- Is Alyeska addressing the causes of near misses and other significant events in an effective and timely manner? Facts about recent events on TAPS, reviewed in their historical context, suggest that Alyeska is failing to deliver on this key component of safe pipeline operations.
- Does Alyeska need to focus on improving contingency plans for unanticipated emergencies? The events reported here – the unrecognized loss of a pig during the emergency shutdown of November 2010 and the improvised responses in January 2011, necessitated by the fact that TAPS was unable to meet the reduced, 14-day safe restart capability requirement – suggest that Alyeska was not properly prepared for emergency shutdowns.
- Without careful review the history of TAPS emergencies and near-miss events, will Alyeska learn from its past mistakes, or will lessons important to pipeline safety remain unlearned? This question calls to mind the well-known adage that those who do not learn from history are condemned to repeat it

The history of the *Exxon Valdez* spill serves as a grim reminder that prevention and protection measures need to be carefully addressed to ensure that similar failures do not recur in the course of future events in the Alaska oil patch. The sudden, unexpected 1989 grounding of the tanker *Exxon Valdez* while transiting Valdez Arm instructs that loose operating practices that appear to be relatively minor when viewed in isolation can combine to cause catastrophe. When the *Exxon Valdez* left the TAPS terminal on the night of March 23, 1989, it was difficult to imagine that less than three hours after leaving the Valdez terminal the ill-fated tanker would be on the rocks, its hull gashed and its black oil cargo pouring into Prince William Sound. **[83]**

The NTSB's report on the *Exxon Valdez* provided a carefully documented account of the slate of problems that came together that fateful night to cause the spill that would be regarded as the nation's worst oil spill until British Petroleum's *Deepwater Horizon* explosion, fire and spill in 2010. Prior to the *Exxon Valdez* grounding, many of the factors that caused and contributed to the spill were probably regarded as minor. Although Alyeska was not primarily responsible for the *Exxon Valdez* spill, the pipeline company was required to have a spill response barge loaded and ready for immediate dispatch. But when the spill occurred, the public was surprised to learn that the response barge was damaged and unloaded at the time of the spill, having been sidelined for repairs for several months. Much of the barge's equipment was buried under several feet of snow. Only one crew members was capable of operating the forklift and the loading crane, delaying the response vessel's departure for nine hours. Additionally, the NTSB found that the terminal operator's oil spill response plan lacked procedures to coordinate Alyeska and tanker company response efforts. **[84]**

The annals of industrial safety are replete with examples of major accidents caused by problems that were regarded as minor (until they came together to create unanticipated consequences). **[85]** It follows from these understandings that Tom Barrett, while chasing excellence, should carefully study the records on Alyeska's pig problems.

Regarding the difficulty of anticipating future events, once again Yogi Berra had a word to the wise: Referring to late-inning baseball surprises, he sardonically remarked, "It ain't over 'til it's over." **[86]** In light of press failure to cover TAPS pig problems and their genesis, when it's over

for North Slope production, will we know how and why it ended? At that time, it will be too late to wonder what the colorful Yankee catcher would have said about those who fail to learn from their history.

The parallels between Enbridge and TAPS and Alyeska's struggles with pigs help frame the questions with which Barrett must deal if the Alyeska president, now finishing his second year, intends to lead the company he now heads toward the same high standards he advocated during his tenure as PHMSA's first administrator.

Endnotes *

- (1) Deborah A.P. Hersman (NTSB Chair), "Opening Statement: Pipeline Accident Report, Marshall, Michigan, July 25, 2010," July 10, 2012, Washington, DC.
- (2) Todd Spengler, "Neglect, inaction caused huge Michigan oil spill, NTSB rules," *Detroit Free Press*, July 10, 2012; Matt Pearce, "NTSB report: Enbridge's response to Michigan oil spill was 'poor'," *Los Angeles Times*, July 10, 2012; Steven Mufson, "NTSB blames Enbridge, 'weak' regulations in Kalamazoo oil spill," *Washington Post*, July 10, 2012.
- (3) Alyeska Pipeline Service Company, *TK-190 Overfill Incident Root Cause Analysis Report And Post Accident Review*, June 22, 2010, pp. 11-14.
- (4) Kevin Hostler (President and CEO, Alyeska Pipeline Service Co.), "President's Message: Unified Plan developed to improve safety, integrity management on TAPS," *Alyeska Monthly News*, Jan. 2008 (accessed Aug. 20, 2010 at *Alyeska, Monthly News*, Jan. 2008).
- (5) Alyeska Pipeline Service Company, "Background – Learning from Ourselves" (Slide 6) and "Management Action Plan for Incident Investigation and Root Cause Analysis Initiative," Nov. 20, 2007, pp. 145-148 (in *Unified Plan Presentation to TAPS Oversight & Regulatory Agencies*, Nov. 28, 2007).

The investigation and follow-through process is a widely regarded key component of safe industrial operations. (See, for example, "Incident investigation and root cause analysis," in Ian Sutton, *Process Risk and Reliability Management*, 2010, p. 575 ("The thorough investigation and analysis of incidents [both actual events and near misses], along with the appropriate follow-up, provides one of the most effective means of improving the safety and reliability of process facilities").
- (6) Alyeska Pipeline Service Co., "March 22, 2007 Pump Station 09 Shutdown Incident," submitted to the Joint Pipeline Office April 17, 2007, *passim*.
- (7) *TK-190 Overfill Incident Root Cause Analysis Report And Post Accident Review*, pp. 13-14.
- (8) More than half of that oil was recovered, but 1,119 barrels were lost in the tank compound (U.S. Dept. of Transportation, Pipeline and Hazardous Materials Safety Administration, "Alyeska Pipeline Company Service Company > Incidents, 2006-2012").
- (9) Joshua Schneyer and Yereth Rosen, "Analysis: Alaska oil line facing increased risks as output falls," Reuters (on-line), January 21, 2011.
- (10) State Pipeline Coordinator's Office, *2011 Annual Report*, pp. 19-21.

(11) State Pipeline Coordinator's Office, *An Assessment of Alyeska Pipeline Service Company's Maintenance Work Prioritization Process*, August 26, 2011, pp. 16-18; cited bases for Alyeska Pipeline Service Company compliance with the Trans-Alaska Pipeline System Right-of-Way Lease ADL 63574: Sec. 16 [Construction Plans and Quality Assurance]; Sec. 22 [Duty of Lessees to Prevent and Abate]; Stipulation 1.18 [Surveillance and Maintenance]).

(12) Summary TAPS oversight history compiled from author's files.

(13) Joint Pipeline Office, "Executive Council Agreement to Support the State-Federal Joint Pipeline Office," circa 1990.

(14) State and federal pipeline monitors no longer share office space at a unified JPO Anchorage office, while JPO Comprehensive Monitoring Reports (formerly identified by JPO as a key document for stakeholders) have not been posted since 2007. The last JPO stakeholders meeting was held in 2007 and the most recent JPO newsletter posted on the internet was issued in September 2009. (From the state side, SPCO has picked up some of the public reporting slack with its annual report.)

(15) National Transportation Safety Board, "Enbridge, Incorporated Hazardous Liquid Pipeline Rupture and Release," July 10, 2012 (NTSB Number PAR-12-01 [Probable Cause]).

(16) Pipeline and Hazardous Materials Safety Administration, "PHMSA Announces Enforcement Action Against Enbridge for 2010 Michigan Oil Spill," July 2, 2012 (press release); and "Opening Statement: Pipeline Accident Report, Marshall, Michigan, July 25, 2010."

(17) Pipeline and Hazardous Materials Safety Administration, "Corrective Action Order" (CPF No. 5-2010-5017H), May 27, 2010; and "RE: Closure of Corrective Action Order CPF 5-2010-5017H" (letter to Mike Joynor [Vice president, Operations, Alyeska]), April 3, 2012.

(18) Pipeline and Hazardous Materials Safety Administration, "Notice of Proposed Safety Order" (CPF No. 5-2011-5001S), Feb. 1, 2011.

(19) Pipeline and Hazardous Materials Safety Administration, "ALYESKA PIPELINE SERVICE CO Federal Enforcement Cases, All Pipeline Systems: 2006-2012," accessed Dec. 7, 2012 at http://primis.phmsa.dot.gov/comm/reports/operator/OperatorIE_opid_26149.html?nocache=3086#_EnforcementActions_tab_1 ("Summary" panel).

(20) See: Wesley Loy, "Alyeska agrees to pay \$600,000 penalty to settle federal cases," Anchorage Daily News, Nov. 27, 2011.

(21) Pipeline and Hazardous Materials Safety Administration, "ALYESKA PIPELINE SERVICE CO Federal Enforcement Cases, All Pipeline Systems: 2006-2012," accessed Dec. 7, 2012 at http://primis.phmsa.dot.gov/comm/reports/operator/OperatorIE_opid_26149.html?nocache=3086#_EnforcementActions_tab_2 ("Detail" panel).

(22) Pipeline and Hazardous Materials Safety Administration, "ALYESKA PIPELINE SERVICE CO, Incident and Mileage Data, All Incidents, All Pipeline Systems: 2006-2012," accessed Dec. 7, 2012 at http://primis.phmsa.dot.gov/comm/reports/operator/OperatorIM_opid_26149.html?nocache=5889#_Incidents_tab_1 ("All Incidents, All Pipeline Systems: 2006-2012)

(23) Pipeline and Hazardous Materials Safety Administration, "Notice of Proposed Safety Order" (CPF No. 5-2011-5001S), Feb. 1, 2011; Thomas J. Barrett (President, Alyeska Pipeline Service Company, "Reference: Notice of Proposed Safety Order CPF No. 5-2011-5001S," Feb. 15, 2011 (letter to Chris Hoidal (Director, Western Region, PHMSA [Government Letter No. 22907, APSC File No. 2.11])); Pipeline and Hazardous Materials Safety Administration, "Consent Agreement" (CPF No. 5-2011-5001S), Aug. 17, 2011 (In the Matter of Alyeska Pipeline Service Company, Respondent).

(24) Pipeline and Hazardous Materials Safety Administration, "Notice of Amendment" (CPF 5-2012-5016M), Aug. 9, 2012 (Letter from Dennis Hinnah [Deputy Director, Western Region, PHMSA] to Mike Joyner [Senior Vice President of Operations, Alyeska Pipeline Service Company]).

(25) State Pipeline Coordinator's Office, *2012 Annual Report*, p. 42.

(26) Hisey and Associates, LLC, "Valdez Marine Terminal Maintenance Assessment Advisory Audit (Final Report)," September 2011, pp. 2-3 (prepared for Prince William Sound Regional Citizens Advisory Council).

Alyeska's problems managing project maintenance was not a new issue. In 2003 a consulting firm working with Alyeska reported that "after a comprehensive internal audit of the corrective action process it was discovered that . . . [Alyeska] had more than 60 different methods of identifying problems and correcting them. Officials at Alyeska knew that they needed to streamline their approach to monitoring safety issues, environmental surveillance, maintenance and overall quality efforts to operate the safest and most efficient pipeline system possible." (AssurX, "Case Study: Alyeska Pipeline Service Company," undated, circa year-end 2003 [accessed June 8, 2012 at <http://www.assurx.com/AlyeskaCaseStudy.html>]).

(27) Alyeska Pipeline Service Co., *Design Basis Update* (DB-180, Ed. 3, Rev. 2), Dec. 31, 2000, p. 2-81.

(28) Chuck Coulson (Chair, TAPS Owners Committee), *et al.*, *TAPS Low Throughput Issues*, October 1, 2008, slide 5.

(29) Alyeska Pipeline Service Company, *Low Flow Impact Study (JPO Discussion)*, Feb. 11, 2010, slides 4-6.

(30) *TAPS Low Throughput Issues*, October 1, 2008, slides 8, 10 and 12.

(31) "Testimony of Tom Barrett, President, Alyeska Pipeline Service Company, on Declining Throughput," pp. 4, 7.

(32) For background and sources on the TAPS lease renewal process, see the author's "Background Report: TAPS Lease Renewal – Opportunity Lost," August 2004 ([click here](#)).*

(33) Robert Krenzelo, T&DR, "Cold Restart: TAPS Design Basis Compliance," Sept. 2, 1997 (Joint Pipeline Office Document #19970911-19). (Memorandum to Jerry Brossia [Authorized Officer, Bureau of Land Management] and Bill Britt [State Pipeline Coordinator]), p. 1 ("Significant Issues: The Cold Restart Procedure is scheduled to be issued August 1998").

(34) For background and sources on TAPS Strategic Reconfiguration, see: Richard A. Fineberg, *Trans-Alaska Pipeline System Strategic Reconfiguration: A Narrative Case Study*, June 4, 2009 (revised), prepared for the Alaska Forum for Environmental Responsibility and the Alaska Wilderness League ([click here](#)).*

(35) Letter from Jerry Brossia (Authorized Officer, BLM/OIPM) and Frederick M. Thompson (Acting State Pipeline Coordinator) to Robert I. Shoaf (JPO Executive Liaison, Alyeska Pipeline Service Co.), June 29, 2005 (JPO Document #20050630-5).

(36) See: "Testimony of Tom Barrett, President, Alyeska Pipeline Service Company, on Declining Throughput," p. 2 and *Low Flow Impact Study* (JPO Discussion), slide 36.

(37) Testimony of Tom Barrett, President, Alyeska Pipeline Service Company, on Declining Throughput," *passim*.

(38) Patrick D. Daniel (President & Chief Executive Officer, Enbridge, Inc.), "Environment, Health and Safety Policy," Jan. 1, 2009 (accessed July 17, 2012 at Enbridge Inc. web site).

(39) See: Elizabeth McGowan and Lisa Song, "The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Off," *Inside Climate News*, June 28, 2012 (Part 1).

(40) Enbridge Inc., "2009 Awards and Recognition," *2009 Annual Report*, p. 167; and "2010 Awards and Recognition," *2010 Annual Report*, p. 171.

(41) Alyeska Pipeline Service Co., "News: Alyeska receives award for Most Improved System for small projects," circa May 2012 (accessed June 11, 2012 at <http://www.alyeska-pipe.com/Inthenews/LatestNews/2012/05/MostImproved/SmallProjects.html> [this article and May 2012 home page from which it was hyperlinked are no longer readily visible]).

(42) Alyeska Pipeline Service Company, "Alyeska Pipeline Service Company recognized as one of 2012 World's Most Ethical Companies," March 15, 2012 (Press Release #1437; accessed July 21, 2012 at http://www.alyeska-pipe.com/assets/uploads/pagestructure/NewsCenter_MediaResources_PressRelease_Entries/634751886453853223_PR1437.pdf).

(43) See: Rose Ragsdale, "30 STRONG: Pipeline pigs dig the dirty work – Instruments used by Alyeska to monitor, maintain 30-year-old infrastructure have improved," *Petroleum News*, Oct. 14, 2007; and Alyeska Pipeline Service Company: *the facts*, 2007, p. 40; *Facts*, 2009, p. 42; and "April 2006 Through October 2006 Pigging Frequency," Nov. 22, 2006 (memorandum).

(44) See: "Written Statement of VADM Thomas J. Barrett, USCG [ret.], Administrator, Pipeline & Hazardous Materials Safety Administration, U.S. Dept. of Transportation," pp. 5-15. (In the 11-page section of the administrator's testimony on "What DOT has done to respond to the failures" each page contains a reference to pipeline pigging operations. These references reveal the manner in which pigging failures increase risks to pipeline safety, on one hand, and the ways in which pigging reduces the risk of spills by inspection of pipeline walls and removal of wax and/or ice, on the other.)

(45) See: Joint Pipeline Office, "4.3.2 Backpressure System Damage/Pig#4 Incident" and "4.3.4 Check Valve 74 Incident," in *A Look at Alyeska Pipeline Service Company's Operation of the Trans-Alaska Pipeline System 1999/2000*, February 2001, pp. 24-27 and 32-35 (Comprehensive Monitoring Program Report).

(46) See: "Statement of Kevin Hostler, President & CEO, Alyeska Pipeline Service Company, before the Subcommittee on Oversight and Investigations, House Energy and Commerce," Sept. 7, 2006, p. 4:

. . . we moved forward our 2007 smart pig run to 2006. The first part of the TAPS mainline was pigged the first week in August and the remainder of the line will be pigged by the end of the year. . . . Alyeska has not identified any wall loss due to corrosion that exceeds Alyeska's internal criteria for wall loss, which is [*sic*] stricter or more conservative than the federal DOT regulatory criteria."

See also: Felicity Barringer, "Device Breaks Up in Pipeline, Search is on for Lost Piece," *New York Times*, Feb. 3, 2007.

(47) Transportation Research Board, "Technical Peer Review of a Proposed Risk Assessment Methodology on Alaska's Oil and Gas Infrastructure," Oct. 15, 2009, pp. 28-29 (Letter Report to the National Academies / National Research Council Transportation Research Board; also see: State Pipeline Coordinator's Office, *2009 Annual Report*, pp. 33-35).

(48) Alyeska Pipeline Service Company, "Barrett to lead Alyeska Pipeline," Nov. 16, 2010 (News – For Immediate Release).

(49) State Pipeline Coordinator's Office, *2011 Annual Report*, Nov. 4, 2011, pp. 30-31.

(50) Alyeska Pipeline Service Company, "'Aufeis' spotting results in spill plan activation," Nov. 18, 2010 ("Keeping You Posted" [KYP] e-mail #10-054 from Michelle Egan on behalf of Alyeska Corporate Communications to All TAPS Employees).

(51) In a July 1, 2010 KYP e-mail message to all employees regarding the In the aftermath of the Pump Station 9 overflow incident, Mike Joynor, Alyeska Senior Vice President of Operations, said that the incident investigation team had concluded that knowledgeable employees, focusing on the unexpected blackout at Pump Station 9 on May 26, 2010, “experienced a loss of situational awareness – a behavior paramount to safely responding to abnormal conditions.” At that time Joynor, repeating the promises made three years earlier following similar problems at Pump Station 9, noted that a management safety board would oversee the development of an action plan to assure management follow-through on corrective action.

(52) State Pipeline Coordinator’s Office, *2011 Annual Report*, pp. 30-32 and *2012 Annual Report*, pp. 40-41.

(53) State Pipeline Coordinator’s Office, *2011 Annual Report*, pp. 19, 21.

(54) Pump Station 10 pig receiving unit history from Alyeska Pipeline Service Company, *Pump Stations*, 1993, and *Facts*, February 1998, p. 24; description of the emergency January 2011 pig extraction at Pump Station 8 from pipeline sources.

(55) Alyeska Pipeline Service Co., *Low Flow Impact Study (FINAL REPORT)*, June 15, 2011, p. 6.

(56) Pipeline and Hazardous Materials Safety Administration, “Consent Agreement,” Aug. 17, 2011, p. 4. (Re: “Notice of Proposed Safety Order” [CPF No. 5-2011-5001S, Feb. 1, 2011].)

(57) Alyeska Pipeline Service Company, *Facts*, 2009, p. 52.

(58) Alyeska Pipeline Service Company, “[Pipeline Operations]” (accessed Sept. 13, 2012 at <http://www.alyeska-pipe.com/TAPS/PipelineOperations/PumpStations>).

(59) “Reference: Notice of Proposed Safety Order CPF No. 5-2011-5001S,” p. 2,

(60) “Notice of Amendment” (CPF 5-2012-5016M), p. 5.

(61) “Reference: Notice of Proposed Safety Order CPF No. 5-2011-5001S,” pp. 1-2,

(62) Alyeska Pipeline Service Company, “Crews managing cleaning pig issue at VMT,” May 14, 2012 (KYP notice #12-009 to All TAPS Employees) and “Crews continue to manage obstruction in relief piping at Valdez Marine Terminal,” May 15, 2012 (KYP notice #12-010); see also Prince William Sound Regional Citizens Advisory Council, “Alyeska Presentation on Pig Incident,” (Briefing for PWSRCAC Board of Directors – 2012), c. August 24, 2012.

(63) Wesley Loy, “Refrigerator-sized device diverts into manifold, breaks up; incident doesn’t stop oil movement as operator uses alternative flow path,” *Petroleum News*, week of Sept. 23, 2012.

(64) Scott Hicks (Alyeska Pipeline Service Company), Briefing to Prince William Sound Regional Citizens Advisory Council Board of Directors, Sept. 20-21, 2012 (Seward, Alaska).

(65) James P. Roscow, *800 Miles to Valdez: The Building of the Alaska Pipeline* (Prentice-Hall, Inc., 1977), p. 15.

(66) Informal briefing by Alyeska President Tom Barrett, June 14, 2012 (Fairbanks, Alaska).

(67) See: Alyeska Pipeline Service Company, *Facts*, 2009, pp. 2 and 24 (Thompson Pass grade) and 93-94 (“Pressure pulsations felt in Thompson Pass created by slackline condition” and installation of “temporary” pressure relief system, 1996-1997). For additional information, see the author’s “Development and Resolution of Pipeline Shaking in Thompson Pass (July 1996 through January 1997,” in *Pipeline in Peril – Alaska at risk on the 20th anniversary of the Trans-Alaska Pipeline: An Update Events on the Troubled Alaska Pipeline Since September 1996*, June 1997, pp. 15-16.

(68) Joint Pipeline Office, *A Look at Alyeska Pipeline Service Company's Operation of the Trans-Alaska Pipeline System 1999/2000*, pp. 25-27.

(69) Mike Joyner, "Subject: KYP #10-030 – Tank 190 Report Completed," July 1, 2010. (For additional discussion of this incident, see *The Story of a Troubled Tank*.)

(70) See: Enbridge, Inc. *2010 Annual Report*, p. 172 and back cover.

(71) The two remaining TAPS owners (Unocal, 1.4% and Koch Alaska, 3.1%) have announced their intention to relinquish their shares to the major TAPS owners or other buyers. (Wesley Loy, "TAPS owners elaborate on pending exits: In filings with the Regulatory Commission of Alaska, Koch and Unocal seek temporary service suspensions, lay out sale plans," *Petroleum News*, July 15, 2012.)

(72) Tom Barrett (then Administrator of PHMSA) at the Pipeline Safety Trust annual conference in New Orleans, Nov. 3, 2006.

(73) Statements by Tom Barrett from audio and minutes available from Alaska State Legislature, "House FINANCE Minutes / Recordings," March 18, 2011. (For Barrett's prepared remarks to the House Finance Committee on that date, see "Testimony of Tom Barrett, President, Alyeska Pipeline Service Company, on Declining Throughput.")

(74) *Ibid.*

(75) Yogi Berra quoted in "Things People Said" (<http://rinkworks.com/said/yogiberra.shtml>).

(76) *Ibid.*

(77) Meeting with Tom Barrett, June 3, 2011 (Fairbanks, Alaska).

(78) Superior Court Judge Sharon L. Gleason, *Decision Following Trial de Novo: 2006 Assessed Valuation of the Trans Alaska Pipeline System* (in *BP Pipelines [Alaska] Inc., et al. and Fairbanks North Star Borough and City of Valdez [Appellants and Cross-Appellants] v. State of Alaska Department of Revenue, et al. [Appellees]*), Alaska Superior Court Case No. 3AN-06-84446 CI [Consolidated], June 24, 2010, at pp. 118 and 121 (heat), p. 155 (\$18 billion replacement) and p. 169 (\$350 billion proven reserves value); and *Amended Decision Upon Reconsideration Following Trial de Novo (Dated October 26, 2010)*, at pp. 120 and 122 (heat), p. 156 (\$18 billion replacement) and p. 170 (\$350 billion proven reserves value).

(79) *Low Flow Impact Study (FINAL REPORT)*, June 15, 2011, Executive Summary, p. 3.

(80) Superior Court Judge Sharon L. Gleason, *Decision following Trial de Novo: 2007, 2008, and 2009 Assessed Valuations of the Trans-Alaska Pipeline System* (in *BP Pipelines [Alaska], Inc., et al. and Fairbanks North Star Borough and City of Valdez [Appellants and Cross-Appellants] v. State of Alaska Department of Revenue, et al. [Appellees]*), Alaska Superior Court Case No. 3-AN-06-08446 CI (Consolidated), Dec. 30, 2011, at pp. 136-137 (bases for BP estimates), 148, 150 (minimum throughput 100,000 bpd or less) and p. 139 ("BP failed to provide").

(81) *Decision following Trial de Novo: 2007, 2008, and 2009 Assessed Valuations of the Trans-Alaska Pipeline System*, pp. 145, 147-148, 150.

(82) Informal briefing on TAPS by Alyeska President Tom Barrett, June 14, 2012 (Fairbanks, Alaska).

(83) "No one anticipated any unusual problems as the *Exxon Valdez* left the Alyeska Pipeline Terminal at 9:12 p.m., Alaska Standard Time, on March 23, 1989" (Alaska Oil Spill Commission, *Spill: The Wreck of the Exxon Valdez – Implications for Safe Transportation of Oil*, February 1990, p. 5 [Final Report]).

(84) For the principal problems that came together on the bridge of the *Exxon Valdez* on the night of March 23, 1989 see: National Transportation Safety Board, *Marine Accident Report: Grounding of the U.S. Tankship Exxon Valdez on Bligh Reef, Prince William Sound near Valdez, Alaska, March 24, 1989*, pp. 166-168 (Report No. PB90-916405) and *Spill: The Wreck of the Exxon Valdez*, *passim*.

(85) See, for example, the analysis of the cause of the ill-fated *Challenger* launch decision in January 1986 by Diana Vaughan in *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA* (University of Chicago Press, 1996), p. 410: "Harm was done. Astronauts died . . . It is a story that illustrates how disastrous consequences can emerge from the banality of organizational life. It is a story of rather ordinary influences on decision making that operate inconspicuously but with grave effect. No fundamental decision was made at NASA to do evil; rather, a series of seemingly harmless decisions were made that incrementally moved the space agency toward a catastrophic outcome."

(86) "Things People Said."

* Documents provided for historical reference may contain hyperlinks that are no longer working due to subsequent changes in how information is reported and maintained by entities responsible for source data.

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