

Trans-Alaska Pipeline System Strategic Reconfiguration: A Narrative Case Study

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**Supplement to May 5 and May 13, 2009 Comments and Recommendations
regarding the
Doyon-Emerald/ABS Proposed Methodology
for the
State of Alaska Oil and Gas Infrastructure Risk Assessment Project ***

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** Comprehensive Evaluation and Risk Assessment of Alaska's Oil and Gas Infrastructure:
Proposed Risk Assessment Methodology (Revision 1; March 20, 2009)*

1. Introduction: The Trans-Alaska Pipeline System (TAPS) Strategic Reconfiguration (SR) Project

It is frequently postulated that government agencies appropriately regulate and monitor TAPS, assuring that the pipeline is adequately operated and maintained. Over the years, a number of citizen activists (this writer among them) have asserted that these assumptions are unwarranted. This report uses the Trans-Alaska Pipeline System (TAPS) Strategic Reconfiguration (SR) program¹ as a case study to provide insight into the current adequacy of TAPS facility operations, TAPS maintenance and the government oversight processes. Sections 2 through 7 lay out facts; Section 8 offers comments and Sec. 9 presents conclusions.

2. Background: The 2002 TAPS Environmental Impact Statement (EIS), the SR Project and the Doyon-Emerald / ABS Proposed Alaska Risk Assessment Methodology

This case study examines how the 2002 TAPS Environmental Impact Statement (EIS)² treated the TAPS SR project, how that project has been implemented and how government agencies have monitored the project. In reviewing what was perhaps the most important planned future event looming on the pipeline's horizon when the EIS was prepared, this analysis demonstrates the importance to assessment of pipeline of (1) first-hand information and (2) the government oversight process.

By way of background: In 2001, as the Alyeska Pipeline Service Company was initiating its application for renewal of its 30-year federal and state grant and lease operating permits for the 800-mile pipeline right-of-way, on a separate track the pipeline

¹ Under SR, the jet-engine powered turbines that had roared at the TAPS pump stations for 30 years were to be replaced with variable speed, electricity-driven pumps and the pipeline control systems were to be automated, with the remote operations center assuming total supervisory control of the 800-mile pipeline. (See: Alyeska Pipeline Service Company, "Strategic Reconfiguration Project Overview," <http://www.alyeska-pipe.com/sr.html> [accessed May 22, 2009]).

² U.S. Department of the Interior, Bureau of Land Management (BLM), *Trans-Alaska Pipeline System Renewal Final Environmental Impact Statement (FEIS)*, November 2002 (<http://tapseis.anl.gov/documents/eis/index.cfm> [BLM/AK/PT-03/005+2880+990]). To prepare the 2002 TAPS EIS, the U.S. Bureau of Land Management retained the Argonne National Laboratory as its principal contractor.

company was also planning for the SR project.³ The federal grant and state lease were renewed, respectively, in November 2002 and January 2003.⁴

Alyeska has described the pipeline makeover project as "a giant technologic leap" that required "the single biggest pipeline investment since construction." When the SR project was formally sanctioned early in 2004 with an estimated budget of \$250 million, detailed engineering had not been completed, equipment manufacturers had not yet been selected and Alaska's winter could be expected to take a chunk out of construction time. Nevertheless, Alyeska officials thought the project would be completed and the new systems installed by the end of 2005.⁵ Five years later, the SR project is more than three years overdue and not yet complete. Moreover, according to unofficial estimates the project budget has tripled.⁶

In dealing with government oversight on TAPS, it is important to note that the Joint Pipeline Office (JPO), an administrative consortium that consists of a dozen state and federal agencies, does not have statutory powers. JPO was created administratively in 1990 to provide "one stop shopping" for industry on pipeline issues.⁷ How this umbrella group works – or does not work – is critical to understanding TAPS oversight issues.

This case study has relevance to the Doyon-Emerald/ABS proposed methodology for the Alaska Risk Assessment (ARA) because the contractors cite the TAPS EIS with evident approval. In the ARA proposed methodology, the contractors write:

³ Alyeska Pipeline Service Company, "Strategic Reconfiguration Program," April 26, 2001 (*appended to this background paper as Attachment A*). Although the project was not officially sanctioned by the TAPS owners until 2004, Alyeska's web site states that "[s]trategic reconfiguration began in 2001" ("Strategic Reconfiguration Project Overview," <http://www.alyeska-pipe.com/sr.html> [accessed May 22, 2009]).

⁴ Joint Pipeline Office (JPO), "Chronology of Events," 2002 and 2003 (<http://www.jpo.doi.gov/JPO/Chronology.htm#2002> and <http://www.jpo.doi.gov/JPO/Chronology.htm#2003> (accessed May 25, 2009)).

⁵ Alyeska Pipeline Service Company, "Pipeline Reconfiguration Project Overview: Pump Stations and Control Systems Upgrade -- Project Completion by End of 2005," March 2005, pp. 2, 4; and "\$250 Million TAPS Upgrade Approved: Alyeska starting biggest TAPS project since construction," *Alyeska Monthly* (on-line newsletter), March 2004.

⁶ In January 2009, Alyeska President Kevin Hostler reported that during 2008 the second of four new pump station entered service (PS 3) and work was proceeding on the third (PS 4). ("President's Message: Looking Back on 2008," *Alyeska Monthly* [Alyeska Pipeline Service Co [on-line newsletter], January 2009.) The Alaska Department of Revenue reports that "[c]urrent [expenditure] estimates are closer to \$750 million" (Alaska Department of Revenue, *Fall 2007 Revenue Sources Book*, p. 44).

⁷ Additional historical information on JPO can be found on the umbrella group's web site (<http://www.jpo.doi.gov>).

A unique aspect of the ARA project is that it considers three different classes of consequences: environment, safety, and reliability. The TAPS Renewal EIS is the only past study known to the project team that also addressed all three of these consequence classes.

. . . . it remains a valuable reference document because of historical outage and spill data collected and documented and the analyses regarding future environmental impacts of TAPS operations.⁸

3. SR and the 2002 TAPS EIS

In discussing SR and the future of TAPS, the 2002 EIS failed to consider at least three significant issues that the TAPS SR makeover, already underway before the final EIS was released, would create for TAPS. At that time, at least some veteran TAPS workers and observers were troubled by potential problems that included: management challenges associated with the SR project,⁹ while formal company documents revealed concerns ranging from the difficulties the closure of pump stations creates for meeting TAPS “Cold Restart” requirements in the event of a winter shutdown¹⁰ to oil spill response plan changes necessitated by pump station closures.¹¹

Although the authors of the TAPS EIS stated that Alyeska had “announced a conceptual engineering study of potential facility upgrades involving modifications to all but 1 of the 11 TAPS pump stations and to the Valdez Marine Terminal,” their analysis

⁸ Doyon-Emerald and ABS Consulting, *Comprehensive Evaluation and Risk Assessment of Alaska’s Oil and Gas Infrastructure: Proposed Risk Assessment Methodology – Revision 1*, Mar. 20, 2009, p. 19 (http://www.dec.state.ak.us/spar/ipp/ara/documents/Proposed%20Risk%20Assessment%20Methodology_Rev%201.pdf).

Note: In footnotes 20 and 30 of the proposed methodology, Doyon-Emerald / ABS identifies the 2002 TAPS renewal EIS as a joint product of the “U.S. Department of the Interior, Bureau of Land Management (BLM) and Alaska Department of Natural Resources Joint Pipeline Office” (*Proposed Risk Assessment Methodology – Revision 1*, p. 164). The Doyon-Emerald/ABS citation is inaccurate. Although the Interior Department and its contractors worked closely with their state counterparts on the 2002 TAPS grant and lease renewals, the EIS was prepared for and released by the federal government. (See: Henri R. Bisson, State Director [BLM], “Dear Reader,” Nov. 26, 2002 [TAPS EIS cover letter], <http://tapseis.anl.gov/documents/eis/index.cfm>.)

⁹ On Nov. 11, 2002, Alyeska President and CEO David Wight sent a “Keeping You Posted” e-mail to all workers, informing them that “Strategic Reconfiguration is continuing to gain momentum,” that an organizational structure for the team had been developed and approved, a program manager had already been named and that several other senior offices would be filled shortly. (See: “Keeping You Posted “ [“KYP #02-090 – Organizational Announcement”], Nov. 11, 2002.). Moments after receiving the “KYP,” one veteran Alyeska employee forwarded it to another with this sardonic comment : “Reserve your seat in a life boat and grab your life jacket as the Titanic is about to set sail. [Exxon Valdez Captain Joseph] Hazelwood got his Ship Captain’s papers back.” (*Attachment B*.)

¹⁰ See: “Strategic Reconfiguration Program,” April 26, 2001.

¹¹ “Oil Spill Contingency Response Under Strategic Reconfiguration,” July 24, 2002 (White Paper, Revision 1). (*Attachment C*.)

regarded the SR plans as similar in nature to a series of routine upgrades or modifications. The EIS emphasized that “the proposed system upgrade exists at this time [2002] only as a preliminary conceptual design study” and concluded that similar upgrades would occur over the life of the renewed lease (30 years), and that “all of the proposed modifications collectively would not constitute a ‘reconfiguration’ of the pipeline.”¹² The 2002 TAPS EIS operating theory that the planned upgrades should be regarded as routine maintenance work is contradicted by the documents referenced above and attached to this report. For example, the 2001 SR presentation clearly indicates that the changes under consideration were intended to be executed shortly, as a single project that would be completed in a compressed time frame – hardly routine maintenance work or minor upgrading.¹³

In sum: Although the Doyon-Emerald / ABS team praises the 2001-2002 TAPS EIS for its assessment of future risks, review of the 2002 EIS demonstrates that its authors incorrectly downplayed the significance of the SR activities Alyeska was planning at the time and therefore failed to discuss (1) the imminence of the pipeline’s largest undertaking since construction and (2) the potential impacts of that massive project on safe pipeline operations.

The authors of the 2002 TAPS EIS assumed that all aspects of preliminary study were to be reviewed and approved by the appropriate agencies prior to plan execution, that JPO would issue authorization to proceed only after Alyeska demonstrated that all federal grant stipulations would be met during modifications and thereafter and that JPO would apply broad management authority to impose additional stipulations as necessary.¹⁴

¹² *Trans-Alaska Pipeline System Renewal Final Environmental Impact Statement*, “Planned Pump Station Upgrades and Valdez Marine Terminal Modifications” (Sec. 4.2.2.6.3), pp. 4-2-11 - 4-2-15. Identical language appeared in Sec. 4.2.2.6.3 of the Draft EIS in July 2002 (U.S. Department of the Interior, Bureau of Land Management [BLM], *Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way*, July 2002 [BLM/AK/PT-02/026+2880+990]). (*Attachment D.*)

¹³ Alyeska’s April 2001 SR presentation called for expenditure of 85% of the project’s total estimated total costs (\$221.3 million of an estimated \$261.3 million) by 2005 (“Strategic Reconfiguration Program,” unnumbered p. 5).

¹⁴ *Trans-Alaska Pipeline System Renewal Final Environmental Impact Statement*, “Planned Pump Station Upgrades and Valdez Marine Terminal Modifications” (Sec. 4.2.2.6.3), p. 4-2-11.

4. Government Approval of the Alyeska SR Project

As noted above, the draft TAPS EIS, which downplayed the significance of SR as a project still in very early planning stages for work whose impacts would be akin to routine modifications, was issued in July 2002 – the same month that Alyeska was circulating a “white paper” on the TAPS Oil Spill Contingency Plan (OSCP) changes that would be required to implement SR. The authors of the spill response white paper noted the “sensitive nature of the subject and timing” of the proposed SR OSCP changes and cautioned readers that it was “essential that any consideration of the OSCP changes with regulators be coordinated through the Right-of-Way Renewal effort.” Otherwise, they warned, OSCP changes “could complicate the Right-of-Way Renewal process.”¹⁵ Apparently those complications were avoided; as noted above, the state and federal lease and grant renewals were approved in late 2002 and early 2003, respectively, without significant discussion of SR.

The Alyeska employee e-mail exchange noted above confirms that when they reviewed the first SR documents, at least some Alyeska veteran field personnel shook their heads in disbelief. Did the engineers in their glass offices in Anchorage and Fairbanks have any idea what they were asking? Apparently the TAPS owners had similar questions; for several years they had declined to grant full funding for the Alyeska program. Despite the pipeline owners’ apparent reluctance to fund Alyeska’s plan, on Dec. 16, 2003, JPO granted formal, conditional approval to the concept of the SR program. Government final (Phase II) approvals necessary to begin construction would come later; to earn those Alyeska had to provide specific information dealing with basic shortcomings in its plan and approximately 130 general and technical items that JPO apparently felt required additional attention before final approval could be granted.¹⁶

¹⁵ “Oil Spill Contingency Response Under Strategic Reconfiguration,” p. 4.

¹⁶ JPO, “Re: Conditional Approval of Alyeska’s Strategic Reconfiguration Preliminary Design Submission (APSC Letter #210),” (letter from Jerry Brossia [Authorized Officer, BLM/OPM] and John Kerrigan [State Pipeline Coordinator, ADN/SPCO] to Rob Shoaf [JPO Executive Liaison, Alyeska Pipeline Service Company]), Dec. 16, 2003 (with 28-page attachment).

According to the authorizing letter, at that time Alyeska’s application also lacked basic elements. The letter listed seven necessary program elements Alyeska was lacking for SR, including: a project schedule; a compliance matrix showing all permits and authorizations necessary to complete a project in compliance with all laws and regulations; discussion of design criteria and methodology to assure that the project components would function effectively; a management of change system; and training program to coordinate the procedures necessary to assuring a smooth transition from the old pumping and control systems to the new, automated equipment.

To some observers it may seem paradoxical that the monitors authorized the project before the TAPS planners had fleshed out the details of the project and provided fundamental information about project

Also at year-end 2003, the oversight agencies obligingly cleared potential roadblocks relating to contingency plan for spill response with the pump stations no longer staffed, despite unanswered questions raised by concerned citizens and veteran Alyeska spill responders. This was accomplished with another condition of approval. In this case, the monitors granted conditional approval to extensive contingency plan modifications while requiring, as a condition of those modifications, a new risk analysis and study of how crude oil travels in fast-moving inland streams crossed by TAPS.¹⁷

Although the SR conditional approval listed more than 100 items for which final approval would come “[w]ith Phase II submittals,” there was no consolidated Phase II submittal and approval. Instead, the SR project proceeded piecemeal, with JPO authorizing small portions of the project – construction, equipment installation, wiring, etc. – one piece at a time.

5. Implementation of the SR Program

As year-end 2005 approached, Alyeska had yet to put its first completely revamped pump station into service. The delayed honor was slated for Pump Station #9, about 100 miles south of Fairbanks, where work was far from complete. Construction and installation activities continued, accompanied by unconfirmed reports that work was conducted at a feverish pace in a chaotic atmosphere). In the process, many procedural breaches were observed. The following examples are presented to demonstrate the perseverance of these practices. Late in October 2005, a JPO engineer observed that equipment was being installed in the new modular units at Pump Station #9 without JPO approval, in violation of lease requirements.¹⁸ The government oversight team conducted numerous surveillances, but the problems continued. In late August 2006, for

implementation. But JPO gave the initial green light even before the TAPS owners themselves had authorized the project.

¹⁷ Letter to Robert I. Shoaf (JPO Executive Liaison, Alyeska Pipeline Service Co.) from Jerry Brossia (Authorized Office, JPO/OMP), "Re: Pipeline Oil Spill Contingency Plan Review -- Annual Approval Including Approval of Strategic Reconfiguration Amendments," Dec. 31, 2003; and Letter to Robert I. Shoaf (JPO Executive Liaison, Alyeska Pipeline Service Co.) from Bill Hutmacher (Program Manager, Alaska Department of Environmental Conservation, Division of Spill Prevention and Response), "Oil Discharge Prevention and Contingency Plan Amendment Approval. See also: U.S. Dept. of the Interior, Bureau of Land Management, "Finding of No Significant Impacts and Decision Record," *Environmental Assessment of the Proposed Reconfiguration of the Trans-Alaska Pipeline System* (EA No. EA-03-009), Jan. 30, 2004.

¹⁸ John Governale and Tom Finger, "Observations of the of the [sic.] SR Work Completed at PS-9 due to APSC Letter 4940, Summer 2005 Construction Pipeline Strategic Reconfiguration Project, 27 October 2005," Nov. 14, 2005 (TAPS Technical Report; JPO No. ANC-05-E-055). (*Attachment E.*)

example, JPO personnel reported incomplete work lists and various inspection, test reports and completion certificates that were not signed.¹⁹ On a follow-up visit five weeks later, some problems were corrected, yet others were not.²⁰ On November 18, 2006, the discovery of seven electrical transformers installed without proper certification led to a work halt to refresh electricians, inspectors and material handlers on pre-installation safety requirements.²¹

Early in 2007, as Alyeska struggled to complete the first of its four pump station modifications at Pump Station #9 in order to put the reconfigured facilities into service, a series of mishaps shattered the pipeline company's hopes for a smooth field transition and sullied the company's carefully nurtured image of professional competence. The following examples indicate the range of the potentially serious events associated with the 2007 startup of the first new TAPS pumping facility:

- On January 6, 2007, one month before the new, automated system went into operation at Pump Station 9, a fire broke out when an unexpected pipeline shutdown triggered oil diversion from the pipeline into the station's relief tank. As the relief tank filled at Pump Station 9, the tank expelled flammable vapors that were ignited by a misplaced Tioga industrial heater that had been brought in to facilitate work related to SR completion in the extreme cold. The fire was put out in five minutes and caused no injuries or damage to equipment, but on-site personnel reported that the flames rose high over the buildings and that workers thought they nearly lost the station.²² The incident revealed a number of

¹⁹ John Governale and Joe Dygas, "Trip Report on Site Visit and Assessment of Functional Check Out Documentation at PS-9, Pipeline Strategic Reconfiguration Project, August 24 & 25, 2006," Oct. 1, 2006 (TAPS Technical Report; JPO No. ANC-06-E-024). (*Attachment F.*)

²⁰ John Governale and Joe Dygas, "Trip Report on Site Visit to Witness the Commissioning of MLU Electric Motor and Assessment of Functional Check Out Documentation at PS-9, Pipeline Strategic Reconfiguration Project, 30 & 31 October 2006," Nov. 7, 2006 (TAPS Technical Report; JPO No. ANC-06-E-026). (*Attachment G.*)

²¹ See: E. Lee Monthei [Strategic Reconfiguration Program Mgr., Alyeska Pipeline Service Co.], "Response to BLM Letter No. 06-313-WW, 'Order for the inspection, removal and preparation of a report of corrective action: improperly qualified electrical equipment installed as a part of Strategic Reconfiguration (SR) and other projects,'" letter to Jerry Brossia [BLM I Authorized Officer] December 7, 2006. (*Attachment H.*)

²² See: Alyeska Pipeline Service Co., "Pump Station 9 Tank Vent Fire Root Cause Incident Investigation & Executive Summary – Final Report," March 9, 2007 (*Attachment I ["Eye"]*); and JPO, "Investigation of the January 6, 2007 PS 9 Tank Farm Fire," March 7, 2007 (prepared by Ray Ellevan [Alaska Dept. of Labor Safety Liaison]; Technical Report Number ANC-07-E-001). According to the JPO April 11, 2007 Weekly Report:

"It was reported in the January 10, 2007 Weekly Report that the Department of Labor Safety and Workforce Development (DOLWD) Liaison was investigating a fire event at Pump Station (PS) 9. An unexpected pipeline shutdown due to an unrelated event at Pump Station 11 began relief operations at PS 9 diverting crude oil flow from the pipeline to a relief tank during shutdown conditions. The relief of crude oil from the pipeline surges into the relief tank results in displacement of flammable vapors from the tank. Approximately one minute after the shutdown initiated, a portable industrial heater, located near one of the vents ignited the flammable crude vapors. The

violations of basic fire safety procedures that Alyeska President Kevin Hostler called “unacceptable” and said Alyeska intended to address by improving safety performance.²³

- In February 2007 Alyeska put the first automated, electric-powered pumps into service; the following month, the new pipeline supervisory control system (“SIPPS,” or Safety Integrity Pressure Protection System) was activated. Soon after, the pipeline's new control system malfunctioned, reportedly on four separate occasions. Perhaps the most serious control system failure occurred March 22, 2007 when the new remote control system diverted mainline oil into the 55,000-barrel pump station pressure relief tank.²⁴ JPO confirmed that the new system malfunctioned, temporarily “going blind.” The OCC was now supposed to be in complete control, but it didn’t know what was going on and couldn’t tell on-site personnel what was happening.²⁵ This malfunction occurred despite Alyeska and JPO approvals of the system²⁶ and prior assurances that the new system would be fully tested before it went into operation.²⁷

fire burned for approximately five minutes and was extinguished when the pump station relief valves closed. There were no injuries or damage to equipment.

“The DOLWD Liaison identified a number of safety deficiencies and Alyeska Pipeline Service Company (APSC) was found to be in noncompliance with the Federal Agreement and Grant of Right-of-Way Section 16, Laws and Regulations and Stipulation 1.20, Health and Safety as well as the State Right-of-Way Lease Stipulations 1.20, Health and Safety and 4.1, State Laws, Regulations, Permits and Authorizations.

“APSC was directed to respond to the investigation findings specifying any action taken as a result of this accident or any plans to prevent future accidents.”

(<http://www.jpo.doi.gov/Publications/07Weekly/4-11-07.htm>)

²³ See: Kevin Hostler (President and CEO, Alyeska), “Moving into the New Year” (President’s Message), *Alyeska Monthly*, November 2007. (Note: In the on-line version of the newsletter, the “President’s Message” on operational issues is replaced by a repeat printing of the October President’s Message, “Visit to Rural Alaska.”) (*Attachment J.*)

²⁴ See: Alyeska Pipeline Service Co., “March 22, 2007 Pump Station 09 Shutdown Incident,” submitted to the Joint Pipeline Office April 17, 2007. (*Attachment K.*)

²⁵ John Governale, “Site Visit top PS-9 for Post Startup Oversight of Pipeline Strategic Reconfiguration Project, 5-6 April 2007,” April 10, 2007 (TAPS Technical Report; JPO No. ANC-07-E-012). (*Attachment L.*)

²⁶ Prior to these events, Alyeska’s technical assessments dealt with SIPPS factory acceptance procedures and concluded that those procedures complied with requirements.

²⁷ In 2005 Alyeska promised the SR program would institute the following measures to make sure the SR project would be delivered safely:

Training

A training program is being developed to ensure all TAPS employees are properly trained and qualified to perform their new jobs. In addition, change leadership training is being provided to all supervisors and managers to enhance skills required to lead an organization through changes in the workplace. The training program will meet or exceed DOT Operator Qualification requirements.

...
Management of Change (MOC)

A rigorous MOC process will document such things as work ownership, transfer of work and critical skill positions. A process has been developed to ensure that effective transition and MOC processes for facilities, processes, procedures and regulatory requirements are effectively communicated and implemented throughout the company to mitigate the risks associated with converting from current pipeline operations to the new configuration.

“Pipeline Reconfiguration Project Overview: Pump Stations and Control Systems Upgrade -- Project Completion by End of 2005,” pp. 10, 11.

- During the summer of 2007 the new pumping system at Pump Station 9 suffered other problems. For example, backup generator problems discovered after a lightning strike knocked out the power at Pump Station 9 and the relief power failed to come on automatically, leaving the station powerless. A test of the backup electrical system failed and changes to the original SR backup system had to be made.²⁸ Meanwhile, the new pumping system was causing extreme vibrations that rocked the station. This problem was mitigated by the design, fabrication and installation of additional supports and bracing to keep the pipes from shaking so hard they might damage themselves and the station's equipment.²⁹

6. BLM's Comprehensive Monitoring Program (CMP) Report on the TAPS SR Project

JPO's Comprehensive Monitoring Program (CMP) was created in 1994 to institute "a substantially broader and more structured oversight program than JPO used previously."³⁰ CMP reports, which were designed to put issues and compliance into broad perspective and to serve as JPO's scorecard for its work, are a key element of the program. Eighteen CMP reports are currently posted on the JPO web site, where the publications page says they "incorporate information produced through surveillances, assessments, technical, and new sources primarily for stakeholders."³¹ At JPO's

²⁸ Doug Lalla, "Observations Made at Pump Station 9 Backup Power Testing on August 14, 2007" August 23, 2007 (TAPS Technical Report; JPO No. ANC-07-E-018); and "Observations Made at Pump Station 9 Auto Start Backup Power Testing for the 2.25 mW Diesel Generator on Loss of GVEA Power, August 25, 2007" August 28, 2007 (TAPS Technical Report; JPO No. ANC-07-E-019)

²⁹ See: "Site Visit top PS-9 for Post Startup Oversight of Pipeline Strategic Reconfiguration Project, 5-6 April 2007," April 10, 2007; and Jim Carlton, "Alaskan Pipeline Pipelines Prompt U.S. Examination," *Wall Street Journal*, Aug. 27, 2007, p. A2. For a picture of pipe on wood cribbing at Pump Station #9, see *Attachment M*.

³⁰ State-Federal Joint Pipeline Office, *1994 Annual Report*, January 1995, p. 24.

JPO's self-described "re-invention" following revelation of extensive TAPS quality control problems at oversight hearings and an extensive "vertical slice" audit of TAPS conducted for BLM by an independent contractor in 1993. (For background see: Joint Pipeline Office, *Trans-Alaska Pipeline System: Activities of the Joint Pipeline Office in Response to the Subcommittee on Oversight and Investigations*, April 1994 [report to the United States House of Representatives Committee on Energy and Commerce, Subcommittee on Oversight and Investigations]; and U.S. Congress, House Committee on Energy and Commerce, *Trans-Alaska Pipeline Oversight: Hearings*, July 14 and Nov. 10, 1993 [Government Printing Office, 1993; Serial No. 103-83].)

³¹ <http://www.jpo.doi.gov/Publications/publications.htm>.

A 2002 CMP report on industry compliance with right-of-way grant and lease terms describes CMP reports as "the key scheduled outputs of JPO work plans." Joint Pipeline Office, *The Trans-Alaska Pipeline System: A Comprehensive Monitoring Program Report Examining Grant & Lease Compliance*, April 2002 (COMP-02-C-001 [Report #11]), p. I-4. (Although cover dated April 30, 2002, this report was not released until May 28, 2002. This delay significantly shortened the time available for public review prior to the 45-day period for public comment on TAPS right-of-way grant and lease renewal. For comment and additional

Executive Council meeting in June 2007, BLM's Authorized Officer portrayed the CMP as a triangle with the CMP reports at the apex, representing the summary distillation of surveillance and engineering reports (the base) and assessments (the middle section).³²

From these descriptions and the June 2007 presentation to the JPO Executive Council, one would never guess (and JPO officials did not mention) that on that date it had been five years since JPO last issued a CMP report.³³ Apart from JPO's sporadic preparation and release of its CMP reports, two government agency audits – one in 2000 (the Interior Department's Inspector General) and another in 2007 (the State of Alaska's Records Manager) – have called JPO's CMP reporting practices into question:

- In 2000, the U.S. Interior Department's Inspector General reviewed JPO's monitoring issues and concluded that "JPO needs to establish an internal quality control review process to ensure that information presented in its Comprehensive Monitoring Program reports and annual reports is accurate and supported." The Inspector General also noted what it described as "weaknesses relating to tracking and reporting compliance issues."³⁴ BLM acknowledged these problems and said it was taking action to remedy them.³⁵
- In 2007, the State of Alaska's Records Manager reviewed the State Pipeline Coordinator's Office records and concluded that "there is a disturbing,

information on JPO's delayed release of 2002 CMP reports see Richard A. Fineberg, *The Emperor's New Horse: How Big Oil Gets Rich Gambling with Alaska's Environment*, June 2002 [Alaska Forum for Environmental Responsibility], pp. ES-3 [Executive Summary, viii [Preface] and 22 [Ch. 3].)

³² Bureau of Land Management, "Comprehensive Monitoring Program," June 13, 2007 (slide), presented by Jerry Brossia, Authorized Officer (JPO). (*Attachment N.*)

³³ No CMP reports were issued between June 2002, when the 12th CMP report listed on the JPO web site was released, and mid-2007. (For CMP report release dates as stated by JPO, see JPO's web site at http://www.jpo.doi.gov/Publications/cmp_others.htm.) Exactly when JPO released the 2007 reports is not clear. The date on the CMP report cover frequently does not match the date when the report was entered into the JPO document tracking system. Based on the document tracking system entries, in most cases the cover dates on the 2007 reports appear to be back-dated.) It is interesting to note in this regard that, based on their document tracking system numbers, three CMP reports were entered into the JPO document tracking system June 12, 2007 – the day before the first JPO Executive Council meeting in five years.

³⁴ Office of the Inspector General, "Survey Report: Oversight Activities of the Trans-Alaska Pipeline System, Bureau of Land Management," U.S. Department of the Interior, February 2001, pp. 5-8 (Report No. 01-I-206). (*Attachment O.*)

³⁵ Among other actions, BLM said it would permanently assign a writer/editor to JPO "to better document supporting evidence for external reports" ("Response to Draft Survey Report on Oversight Activities of the Trans-Alaska Pipeline system, Bureau of Land Management [C-IN_BLM-022-99-R]," Nov. 3, 2000, p. 2 [memo to Assistant Inspector General for Audit from Tom Fry, Director, Bureau of Land Management, through Sylvia V. Baca, Assistant Secretary, Land and Minerals Management; not included in Attachment O].)

Although JPO filled that position, this writer's review of the subsequently published CMP reports found that CMP report results in those reports frequently contradicted the documentary record of the surveillances and assessments that built the report. (See: Richard A. Fineberg, *The Emperor's New Horse: How Big Oil Gets Rich Gambling with Alaska's Environment* [Alaska Forum for Environmental Responsibility], 2002, pp. 21-68.)

substantiated allegation that some case files include BLM-authored technical reports issued on JPO letterhead that imply state concurrence regarding federally executed work, but in reality no state participation has occurred.” The State Records Manager recommended that the state members of the JPO umbrella group “should immediately request an Attorney General’s Office investigation, opinion or memorandum of advice regarding potential state liability associated with the current questionable business practices of the BLM.”³⁶

With this background in mind, four details about BLM’s presentation of its June 2007 CMP report on Alyeska’s performance on SR³⁷ can be observed:

- The report was signed by its author June 12, 2007, making it the fourth CMP report that moved toward completion on the day before the JPO Executive Council held its first meeting in five years, following a five-year hiatus in the production and release of any CMP reports at all.³⁸
- The CMP SR report (like all the 2007 CMP reports) bears BLM (not JPO) logo.
- This report (unlike the other six CMP reports completed in 2007) was not posted on the JPO web site.³⁹
- Although JPO reports are prepared for stakeholders, this report says that it is a “TAPS Technical Report.”

An authoritative analysis that is comprehensive in scope and clearly worded might render the preceding details irrelevant in the larger scheme of things. The following paragraphs evaluate the CMP SR report.

BLM’s SR CMP report paid notably little attention to the problems at Pump Station #9 as the TAPS operators sought to put new systems into place and bring them on line; the Jan. 6, 2007 fire event is a case in point. Because a major goal of the SR project is to reduce fire hazards, some may find it surprising that a BLM Comprehensive Monitoring Program (CMP) report failed to include detailed discussion of that 2007 fire. But that event was undoubtedly the subject of the following brief exercise in obscurity:

An unfortunate undesirable event occurred in which a work crew was too close to the oil storage tanks during a relief event in which both people and facilities could

³⁶ D. Dawson, CRM (State Records Manager), “Subject: State Pipeline Coordinator’s Office – Analysis and Recommendations,” April 30, 2007 (memorandum), pp. 1-2. (*Attachment P.*)

³⁷ See: U.S. Bureau of Land Management (Office of Pipeline Monitoring), *Performance of the Strategic Reconfiguration Project*, June 2007 (TAPS Technical Report, JPO No. ANC-07-E-011, prepared by Joe Dygas). (*Attachment Q.*)

³⁸ JPO officials signed off on the SR review two days later, the day after the Executive Council meeting.

³⁹ I received two separate hard copies from JPO late in 2007 in response to a Freedom Information Act request.

have been seriously injured. This occurrence could have been avoided if better supervision and communications had been employed.⁴⁰

Because this passage did not use the “F” word (“fire”), the CMP report did not have to resolve the apparent contradiction between the fact of the brief but intense fire at Pump Station #9 on Jan. 6, 2007 (with flames rising high in the air in what was described as a huge fireball) and statements such as the following:

The SR objectives consisted of: addressing compliance with State Fire Codes, extending the life of TAPS for another 20 years, providing better operational flexibility, reliability, remote operation with a completion date of December 2005. At Pump Station 9 at least, these objectives were largely met except for completion by December 2005.⁴¹

The BLM report was critical of Alyeska for biting off more than the company could chew, observing that “[p]erformance of the Strategic Reconfiguration (SR) Project was compromised by several factors. In the initial stages, a highly aggressive schedule and too broad scope led to poor engineering design, project management and procurement decisions,” and “[r]eview of the history of the SR Project, concludes that the initial project priorities and schedule were not appropriate to the scope of the initial project.”⁴²

The following statements from the BLM report confirm the impression from the documents summarized above that the JPO permitting strategy for the SR project – deferring final approvals in Phase II to numerous mini-authorizations – did not work very well:

Issues concerning the SR quality program were numerous throughout JPO’s SR project reviews.

At least three submittals were returned for grossly incomplete and inaccurate information.

. . . unapproved equipment was installed and placed in service despite numerous quality inspection programs in use by APSC and APSC contractors. . . . 2006 APSC and JPO evaluations of the program verified that internal controls of quality were not satisfactory. Deficiencies identified were, for the most part, the same issues that have been problematic since 1993.⁴³

⁴⁰ *Performance of the Strategic Reconfiguration Project*, p. 31.

⁴¹ *Performance of the Strategic Reconfiguration Project*, p. 19.

⁴² *Performance of the Strategic Reconfiguration Project*, pp. 26, 35.

⁴³ *Performance of the Strategic Reconfiguration Project*, pp. 24-28.

Despite the dismal picture of Alyeska's SR performance painted by these statements, the BLM report did not explore the systemic causes and the consequences of these. Instead, the report downplayed or ignored the SR start up problems at Pump Station #9 and concluded that the new pumping and control facilities were brought on line "with a high level of performance that led to a successful start up at PS 9 in February 2007."⁴⁴ According to the BLM report:

APSC's management oversight of the SR project improved substantially after the departure of the original SR Project Manager and Coordinator. Perhaps one of the best bright spots in management of the project occurred in the FCO [Functional Check Out] Phase, Commissioning Phase and the Start up Phase. Each of these post construction phases were well organized, staffed, managed and appropriate and careful progress made leading to the successful startup of PS 9 [sic].⁴⁵

It is difficult to reconcile the BLM SR report's carefully crafted endorsement of the Pump Station #9 start-up with the rash of near-miss and other significant problems discussed briefly above.

7. PHMSA's 2007 and 2008 Proposed Alyeska Fines

BLM's endorsement of Alyeska's performance in 2007 stands in marked contrast to that of the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA). Violations of federal requirements for safe pipeline operations and failure to follow company operating guidelines in December 2006 and January 2007 earned Alyeska a proposed civil penalty of \$817,000 from the federal agency. According to PHMSA records, the proposed Alyeska fine was more than twice the amount of the second largest proposed civil penalty the agency issued during 2007.⁴⁶ The proposed penalties levied by PHMSA calls for payment of:

⁴⁴ *Performance of the Strategic Reconfiguration Project*, pp. 4 (Executive Summary) and 35 (Conclusions).

⁴⁵ *Performance of the Strategic Reconfiguration Project*, p. 30.

⁴⁶ U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), [Notice of Probable Violation, Proposed Civil Penalty and Proposed Compliance Order](#) ("NOPV;" CPF 5-2007-5041), p. 12; and [Notice of Amendment](#) (CPF 5-2007-5042M), Nov. 27, 2007 (letters from Chris Hoidal [Director, Western Region, PHMSA] to Mr. Jim Johnson [Pipeline Vice President, Alyeska]).

- \$506,000 for eight separate violations of operating procedures and safety practices that caused the January 6, 2007 fire (itself PHMSA's largest proposed penalty of 2007);
- \$195,000 for repeated failures to follow its manual of operational procedures that caused a n oil spill at a remote gate valve in the Brooks Range three days later; and
- \$116,000 for failures to implement anti-corrosion measures in a timely manner.⁴⁷

PHMSA also cited Alyeska for additional operational shortcomings associated with the destruction of a pipeline cleaning device known as a pig in December 2006. According to PHMSA, "[t]hese failures . . . are cause for concern regarding the operational integrity of TAPS." In addition, the Nov. 27, 2007 notice warned Alyeska to correct five other reported operating procedure deficiencies for which no penalties were issued.⁴⁸

In 2008, PHMSA issued an additional \$338,000 in proposed penalties against Alyeska. Review of PHMSA on-line records indicates that none of the 2007 and 2008 cases have been resolved.⁴⁹

8. Comments

The following comments track the factual narrative presented in sections 1 through 7, above.

8.1. Introduction: The Trans-Alaska Pipeline System (TAPS) Strategic Reconfiguration (SR) Project

In the public input meetings during the ARA team's initial outreach efforts, TAPS SR was frequently mentioned by citizen stakeholders as a source of concern. According to the ARA record of public meetings, the effect of automated pump stations on initial spill response capabilities, which had relied on pump station personnel, was the main issue. Unmentioned by the ARA team was the second set of concerns dealt with here: the increased risks associated with the implementation process. There is no indication

⁴⁷ PHMSA, *NOPV*, pp. 2-8 and 12-13.

⁴⁸ PHMSA, *NOPV*, pp. 1, 9-11 and 13.

⁴⁹ See: "Enforcement Actions Initiated " and "Enforcement Actions Resolved" tabs for Alyeska Pipeline Service Company, in "Summary of Enforcement Actions," U.S. Pipeline and Hazardous Materials Safety Administration, at http://primis.phmsa.dot.gov/comm/reports/enforce/Actions_opid_26149.html#TP_1_tab_1 and http://primis.phmsa.dot.gov/comm/reports/enforce/Actions_opid_26149.html# TP_1_tab_2 (accessed May 19, 2009).

that the ARA team recognized this set of concerns, but it didn't matter because the ARA team's general response to SR concerns was to dismiss them.⁵⁰

8.2. Background: The 2002 TAPS Environmental Impact Statement (EIS), the SR Project and the Doyon-Emerald / ABS Proposed Alaska Risk Assessment Methodology

While many observers (including this writer) assert that the documentary record clearly demonstrates that the federal and state team that conducted the TAPS right-of-way grant and lease renewal proceedings in 2001-2002 basically ignored the concerns of the environmental community and other concerned citizens, this case study does not depend on or seek to re-examine that history. The narrower purpose and focus of this endeavor is to provide a documentary record – along with background understanding to help readers understand the significance of the documentary record and the lessons to be taken from that record.

8.3. SR and the 2002 TAPS EIS

(a) The 2002 Trans-Alaska Pipeline System (TAPS) Environmental Impact Statement – a study praised by the authors of the Doyon-Emerald/ABS proposed methodology for the risk assessment of the Alaska oil and gas production and transportation infrastructure – did not apprehend correctly the imminence, the significance or the possible effects of the TAPS Strategic Reconfiguration (SR) program.

(b) Regarding the 2002 TAPS EIS failure to evaluate the potential consequences of the SR program on pipeline operational safety, it can also be observed that:

- the magnitude of the SR program under consideration in 2002 made potential consequences of project-related activities difficult to overlook; and
- the analytical framework the authors of the TAPS EIS employed to avoid focusing on SR seems remarkably strained and out of touch with the realities of the situation.

(c) The 2002 EIS assessment of SR risks relied on assumed effective government oversight, to assure safe and appropriate construction and operating

⁵⁰ The ARA team generally listed SR concerns as “no action” items – concerns that required no action on the part of the ARA team.

practices. Two elements of these assumptions are particularly significant to the proposed ARA methodology:

- First, the authors of the 2002 EIS explicitly viewed the government oversight function as an essential part of petroleum facility operations;
- secondly, the authors of that document implicitly assumed that oversight performance would be appropriate and effective.

8.4. Government Approval of the Alyeska SR Project

(a) The Alyeska SR “white paper” circulating while the pipeline right-of-way renewal EIS was being prepared explicitly warned that discussion of SR spill response plans should be coordinated with pipeline company lease renewal managers because discussion of spill response plan personnel and equipment deployment changes could adversely affect lease renewal. This statement regarding sensitivity to the EIS renewal process suggests (but does not prove) that documents might have been withheld from the EIS team or otherwise manipulated to aid company policy goals.

(b) Regardless of how one chooses to interpret the “white paper” warning, the difference between the official spin on SR and worker concerns – indicated by the e-mail comments in response to the Alyeska CEO’s “keeping you posted” announcement in November 2002 – demonstrates the importance of obtaining “boots on the ground” information to ensure that the tendered documentary record constitutes the best possible reflection of reality. Put Otherwise: This episode makes clear the need to make sure evaluators of physical facilities, their maintenance and their operating procedures have access to good information.

(c) Government oversight agencies granted SR project conceptual approval on a conditional basis, identifying some 130 specific issues that would have to be addressed before installation could begin on the facility to which each condition was attached. One wonders: Did it make sense to approve the project on a piecemeal basis? Without the basic information JPO required for approval of specific aspects of the SR project, how could Alyeska plan for these endeavors?

8.5. Implementation of the TAPS SR Program

(a) It will be recalled that even before the right-of-way grant and lease were renewed, TAPS veterans were concerned about issues such as management challenges, spill response capabilities under SR and the inability to meet design basis requirements for a cold restart in the event of an extended winter shutdown. The record indicates that these and other problems were not resolved as SR progressed, exposing TAPS and the lands and water through which it passes to added risk. Nevertheless, due to time and resource constraints and the difficulty one encounters securing information on critical factors from JPO and Alyeska in a timely manner, this paper is limited to documenting only management challenges posed by SR and their apparent effects.

(b) The early 2007 mishaps at Pump Station #9 during SR startup demonstrate the importance of evaluating near-miss events whose consequences might have been catastrophic.

(c) The problems experienced at Pump Station 9 between 2005 and early 2007 as the TAPS operators sought to put new systems into place and bring them on line suggest that abnormal conditions increase the risk potential inherent in normal operations.

(d) It is possible that the mishaps at Pump Station #9 during SR startup may have been induced at least in part by factors such as the pipeline company's push to make up lost time on project completion, which may have led workers to routinely violate safe operating standards.

(e) It is also possible that the piecemeal "Phase II" work permitting framework established by the Joint Pipeline Office (JPO) that overloaded the oversight system with permitting paperwork may have been a contributing causal factor to the mishaps at Pump Station #9 during SR startup.

(f) Although the working hypotheses summarized in paragraphs (b) through (e) above follow directly from the events documented in the text of the preceding section, they are not presented here as proof of theory. Rather, they are presented to support the proposition that unless and until these theories have been substantively refuted or the root causes of the problems experienced at Pump Station #9 have been identified and definitively corrected, it does not make sense assume that operating, maintenance and oversight procedures are functioning effectively on TAPS to mitigate risk.

8.6. BLM's 2007 Comprehensive Monitoring Program (CMP) Report on the TAPS SR Project

(a) The failure to prepare or release a CMP report for five years and the failure to announce, distribute or post the 2007 CMP reports when released renders suspect JPO claims of high regard for stakeholders.

(b) In 2000 and again in 2007, government agencies identified what they apparently considered serious deficiencies in JPO's TAPS oversight process

(c) The fact that the State of Alaska Records Manager felt compelled to investigate allegations that boxes of documents were missing and that state personnel believed persons from a federal agency were withholding state documents from the state suggests the monitoring team may be dysfunctional to a surprising degree.

(d) Where an authoritative, comprehensive and clearly worded CMP report would dispel concerns about TAPS CMP reports based on circumstance and small details, the substantive CMP report shortcomings discussed in the text of the preceding section instead lend credence to these concerns.

(e) The failure of the government oversight team to provide coordinated focus on the causes and consequences of the early 2007 mishaps at Pump Station #9 during SR startup demonstrates

- (1) that it is a mistake to assume government oversight effectiveness and, consequently,
- (2) the need for independent review of the effectiveness of government monitoring efforts.

8.7. PHMSA's 2007 and 2008 Proposed Alyeska Fines

The fact that the safety violations that led to the Jan. 6, 2007 fire earned Alyeska the dubious distinction of garnering the largest pipeline safety fine issued by PHMSA in 2007 suggests that issues of TAPS performance during the changeover to SR at Pump Station #9 warrant consideration as serious breaches in safe operations.

9. Conclusions

Professional stakeholders and other informed public interest observers have pointed out important technical shortcomings in the ARA team's proposed methodology. The focus of this paper is to provide substantive information and background context to

demonstrate the importance of (1) “boots on the ground” field work and (2) independent analysis of the government monitoring system. Here are some of the salient conclusions that follow from this narrative:

- The ARA team received many stakeholder expressions of concern about SR during its original outreach effort in 2008 but failed to ascertain what those concern might have been or take action to assure that the ARA methodology addressed them, suggesting an apparent lack of responsiveness to stakeholder concerns. The fact that the ARA team’s public outreach program failed to identify the significance of the relationship between SR program implementation and safe operations suggests that the public process may not have provided the would-be risk assessment practitioners with sufficient empirical input information to assure identification of the conditions that might put facilities at risk.
- Input from on-site inspections can serve two fundamental purposes: (1) to validate the appropriateness of data selected for analysis and (2) to quality check the results of that analysis.
- The documentary information supporting this case study shows the importance of information that is most likely to be obtained through direct contact with people involved in day-to-day operations of the facilities whose operating and maintenance risks the ARA project is supposed to identify and reduce.
- In the absence of empirical data analogous to the information presented in this case study, a risk analysis based on abstract data is liable to miss critical causal factors and therefore suffer from the well-known phenomenon (sometimes called “GIGO”) which occurs when faulty inputs lead to invalid results.
- It is frequently asserted that TAPS is well operated, well maintained, and that government oversight is appropriate and effective in assuring optimal risk mitigation; the problems associated with putting SR facilities and equipment into service at Pump Station #9 in early 2007 suggests otherwise.

- Regarding government oversight, this case study shows:
 - the fallacy of excluding government oversight from evaluation as a part of the petroleum production and transportation facilities; and
 - the fallacy of assuming, without objective corroboration, that government monitors of Alaska oil and gas facilities are (a) immune from socio-economic pressures to support development and (b) performing their oversight mission effectively to assure that risks are appropriately minimized and/or mitigated.

- The JPO granting of a phased permit at the outset of the SR project and BLM's preparation of a flawed CMP report on implementation suggest that JPO's development-oriented mission⁵¹ may conflict with the need for independent oversight of the industry.

⁵¹ From the JPO home page: "JPO's Vision: To work proactively with Alaska's oil and gas industry to safely operate, protect the environment, and continue transporting oil and gas in compliance with legal requirements" (<http://www.jpo.doi.gov/index.htm>).

List of Attachments

(Fineberg Comments 2 of 4)

- Attachment A. "Strategic Reconfiguration Program," April 26, 2001.
- Attachment B. "FW: KYP #002-090 – Organizational Announcement," Nov. 11, 2002..
- Attachment C. "Oil Spill Contingency Response Under Strategic Reconfiguration" (White Paper, Revision 1), July 24, 2002.
- Attachment D. *Final Environmental Impact Statement: Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way* (Vol. 3: Sections 4.1 through 4.6), November 2002.
- Attachment E. "Observations of the of the SR Work Completed at PS-9 due to APSC Letter 4940, Summer 2005 Construction Pipeline Strategic Reconfiguration Project, 27 October 2005," Nov. 14, 2005.
- Attachment F. "Trip Report on Site Visit and Assessment of Functional Check Out Documentation at PS-9, Pipeline Strategic Reconfiguration Project, August 24 & 25 2006," Oct. 1, 2006.

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- Attachment G. "Trip Report on Site Visit to Witness the Commissioning of 11LU Electric Motor and Assessment of Functional Check Out Documentation at PS-9, Pipeline Strategic Reconfiguration Project, 30 & 31 October 2006," Nov. 7, 2006.
- Attachment H. "Order for the inspection, removal and preparation of a report of corrective action: Improperly qualified electrical equipment installed as part of Strategic Reconfiguration (SR) and other projects," Nov. 22, 2006.
- Attachment I. "Investigation of the January 6, 2007 PS 9 Tank Farm Fire," March 7, 2007.
- Attachment J. "President's Message: Moving into the New Year," November 2007.
- Attachment K. "March 22, 2007 Pump Station 09 Shutdown Incident," March 13, 2007 [April 13, 2007
- Attachment L. "Site Visit to PS-9 for Post Startup Oversight of Pipeline Strategic Reconfiguration Project, 5-6 April 2007," April 10, 2007.
- Attachment M. "Pump Station 9: Suction Pipe Supported by Wooden Cribbing to Protect it from Unanticipated Vibration," August 2007.
- Attachment N. "Comprehensive Monitoring Program," June 13, 2007.
- Attachment O. "Interior Department Audit of JPO," February 2001.

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- Attachment P. "Subject: State Pipeline Coordinator's Office, Analysis and Recommendations," April 30, 2007.
- Attachment Q. "Comprehensive Monitoring Program Report: Performance of the Strategic Reconfiguration Project," June 25, 2007.