



# **JOINT PIPELINE OFFICE**

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## **Comprehensive Monitoring Program Report**

### **Evaluation of Alyeska Pipeline Service Company's TAPS Employee Safety Program**

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## Our Message to Stakeholders

### Importance of TAPS

The Trans-Alaska Pipeline System (TAPS) transports nearly 20 percent of the nation's domestically produced crude oil through the unique and fragile environment of Alaska. TAPS is critical to the national security and revenues from crude oil transported by TAPS account for approximately 85 percent of the State of Alaska's general fund. Since start-up in 1977, TAPS has safely transported more than 12 billion barrels of crude oil from Prudhoe Bay to Valdez. The Joint Pipeline Office (JPO), a consortium of six State and five Federal agencies, oversees Alyeska's management of TAPS.

### JPO's Comprehensive Monitoring Program

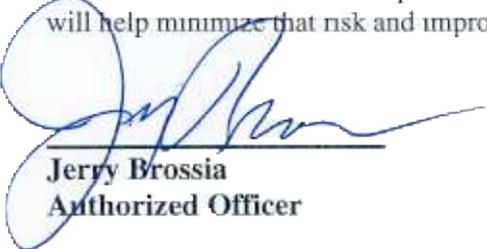
The JPO Comprehensive Monitoring Program (CMP) is intended to influence continuous improvement in Alyeska's management of TAPS construction, operations and maintenance activities while assuring that the environment, public safety and pipeline integrity are protected. The JPO vision is: ***"To work proactively with the oil and gas industry in Alaska to achieve safe operation, environmental protection, and continued transportation of oil and gas in compliance with legal requirements."*** The JPO CMP process is focused on problem prevention rather than reaction, emergency response, and damage control.

CMP Reports periodically communicate to JPO stakeholders summaries of past significant findings, conclusions and recommendations drawn from JPO monitoring efforts. They revisit critical TAPS audit deficiencies; incorporate concerns raised by TAPS employees and outside interest groups; address high risk activities; verify compliance with laws, regulations, permit conditions, and grant/lease stipulations; verify compliance with important internal Alyeska controls such as the quality, safety and environmental programs; and evaluate causal factors and trends related to recent TAPS incidents. Each report covers one of twelve CMP functional topics and addresses a selection of significant issues of concern to JPO and its stakeholders. The twelve CMP functional areas are:

- |                                       |                  |                       |
|---------------------------------------|------------------|-----------------------|
| → Alaska Native Employment & Training | → Environment    | → Project Performance |
| → Configuration Management            | → Maintenance    | → Quality             |
| → Employee Concerns Program           | → <i>Safety</i>  | → Risk Management     |
| → Equal Employment Opportunity        | → Project Design | → Operations          |

### About This Report

The JPO is pleased to present this report on *Alyeska Pipeline Service Company's Employee Safety Program* to our stakeholders. There is significant potential for direct, indirect and cumulative impacts to the environment from TAPS operations. While TAPS operations will never be risk-free, JPO oversight will help minimize that risk and improve Alyeska's employee safety performance.



Jerry Brossia  
Authorized Officer



William G. Britt, Jr.  
State Pipeline Coordinator

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## Executive Summary

The Joint Pipeline Office (JPO) evaluated surveillances and assessments conducted by JPO, employee concerns investigated by JPO, the BLM audit conducted by QTC, Inc. and the TAPS Assessment Audit to determine the status of Alyeska's employee safety program. Considering that a certain amount of risk exists in any work environment, JPO formed these conclusions:

- **Alyeska is generally in compliance with grant and lease stipulations 1.17, Fire Prevention and Suppression and 1.20, Health and Safety, based on 1996-1997 performance.** Compliance with Stipulation 1.17 needs improvement.
- **Alyeska has constructed buildings without approved plans from the State fire Marshall.**
- **The fire detection and suppression systems in the pump station and Valdez Marine Terminal processing areas meet the requirements of the grant and lease.**
- **The Alyeska Corporate Safety Manual (SA-38) adequately addresses safety of the workers on TAPS equipment and facilities.** Alyeska is in compliance with the requirements of SA-38, however, some sections could use improvement.
- **Alyeska conducted major maintenance projects in a safe manner that minimized risk to workers.** Alyeska and its contractors employ a competent safety staff to minimize accidents and mitigate risks.
- **Alyeska makes a concentrated effort to identify and abate hazards.**
- **Supervisors investigate and report accidents in a proper and timely manner, obtaining assistance of Alyeska safety staff when necessary.** Alyeska accident rates are lower than the national average.
- **The number of employee concerns relating to worker safety have decreased.** JPO investigates and resolves employee concerns as they surface.
- **JPO surveillance indicates audit items relating to worker safety are not repeating.**

JPO concluded that Alyeska has made a good faith effort to implement a personnel safety program. Alyeska's Employee Safety Program is effective in minimizing risk to personnel. No negative trends were noted and accident statistics are below the national average. These conclusions are consistent with accident statistics and the results of JPO's field surveillance and assessments. JPO determined that Alyeska is in compliance with the requirements of their Corporate Safety Manual (SA-38), with some exceptions noted in Chapter 2. JPO considered these exceptions to be minor in nature and Alyeska has satisfactorily addressed each finding.

- **JPO will continue to closely monitor the TAPS Safety Program.**

JPO will continue to closely monitor Alyeska's compliance with the safety stipulations of the grant and lease. Ongoing surveillance of selected sections of SA-38 assures JPO and its stakeholders that Alyeska will maintain and improve their Employee Safety Program.



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# Chapter 1. Introduction

## Purpose

The Comprehensive Monitoring Plan Safety Report is the fourth in a series of stakeholder reports that take a “big picture” look at specific TAPS operations. This report presents the results of the JPO’s Comprehensive Monitoring Program (CMP) review of Alyeska Pipeline Service Company’s employee safety performance on the Trans Alaska Pipeline System (TAPS). JPO’s results are based on findings, conclusions and recommendations from oversight activities. The report evaluates aspects of Alyeska’s Employee Safety Program and examines selected issues which are of potentially high risk to personnel.

## Monitoring Personnel Safety

The JPO did not have an oversight program to monitor workplace safety issues on TAPS prior to 1994. Instead, JPO focused on land use, surface protection, and environmental issues.

Audits of Alyeska conducted in 1993-1994 changed JPO’s focus from “what happens if oil gets on the ground” to “keeping the oil in the pipe.” JPO hired Ray Elleven of the Alaska Department of Labor (ADOL) in December 1993 to monitor TAPS safety issues and oversee the resolution of safety related audit action items. Tom Stuart, an ADOL Electrical Inspector, joined Mr. Elleven in 1995 to enforce electrical safety codes and monitor TAPS electrical repairs. In 1997, Don Verble succeeded Tom Stuart as the JPO ADOL Electrical Inspector to continue TAPS electrical systems oversight for compliance with State and Federal requirements. JPO issued the first assessments of Alyeska’s Employee Safety Program in 1996.

## Scope and Methodology

CMP reports present a broad view of JPO’s monitoring results to form conclusions about grant and lease compliance and whether audit action items or employee concerns are repeating. The focus of this CMP Safety Report is personnel safety, not pipeline system safety. Pipeline system safety will be addressed in future CMP reports. This report covers the time between January 1996 and December 1997.

This CMP Safety Report is the result of a four-phase Comprehensive Monitoring Program process, where JPO: 1) scoped the TAPS safety issues, 2) developed detailed surveillance plans and checklists, 3) conducted the surveillances, or field observations of TAPS safety programs and, 4) included the results in this final CMP Safety Report. This four-phase CMP process is referred to in our *Message to Stakeholders* and in JPO’s November 1996 *Comprehensive Monitoring Program* document that explains the scope of the twelve CMP areas.

JPO evaluated surveillances and assessments conducted by JPO, employee concerns investigated by JPO, the BLM audit conducted by QTC, Inc. and the TAPS Assessment Audit to determine the status of Alyeska’s Employee Safety Program.

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## Chapter 2. Grant and Lease Compliance

- **Alyeska is generally in compliance with grant and lease stipulations 1.17, Fire Prevention and Suppression and 1.20, Health and Safety, based on 1996-1997 performance.** Compliance with Stipulation 1.17 needs improvement, which is explained below in the section on *Fire Prevention*.

Alyeska is required by the Federal Agreement and Grant of Right-of-Way and State Lease of Right-of-Way (known as the grant and lease) Stipulation 1.17, *Fire Prevention and Suppression* to implement and maintain an effective fire prevention program, install fire detection and suppression systems in all Alyeska processing facilities, and train staff to fight fires when necessary.

The grant and lease Stipulation 1.20, *Health and Safety* requires a health and safety program that protects employees, abates hazards, and reports serious accidents to the Authorized Officer and State Pipeline Coordinator.

Alyeska developed Corporate Safety Manual (SA-38), to provide specific guidance for compliance with the requirements of the grant and lease stipulations. JPO evaluated SA-38, using the four-phase CMP process, and performed eight field surveillances of five specific areas of the Safety Program. JPO assessed the surveillance results, searched for trends, and identified findings or deficiencies at the assessment level. The results were summarized in subsequent assessment reports and sent to Alyeska for response. Alyeska responded to JPO, specifying how and when the findings would be resolved and who was assigned responsibility for resolution.

### Fire Protection

- **Alyeska has constructed buildings without approved plans from the State Fire Marshall.**
- **The fire detection and suppression systems in the pump station and Valdez Marine Terminal processing areas meet the requirements of the grant and lease.**

***Fire Prevention.*** SA-38, Section 1 requires that plans for new buildings be approved by the State Fire Marshall before construction. Alyeska violated this requirement twice. The first violation occurred during the construction of the Drag Reducing Agent (DRA) facility at Pipeline Mile Post (PLMP) 238. During the spring of 1997, Alyeska began the first phase of the project by constructing a concrete foundation at the work site. The injection equipment was installed and operational by the end of June 1997.

The next phase of the project involved construction of a building over the injection system equipment. Alyeska submitted the building plans to the State Fire Marshall on June 10, 1997 and they were approved July 23, 1997. However, Alyeska began construction July 1, 1997, before the plans were approved. The fire suppression system became operational in January 1998. The second violation occurred when Alyeska did not submit plans to the State Fire Marshall for the new fabric buildings at Pump Station 4.

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**Fire Detection Systems.** Critical work areas system-wide on TAPS contain ultraviolet detection systems that detect sparks or flashes and activate visual or audible alarms in work areas and control rooms. Other areas, such as pump station permanent living quarters, offices, and support buildings have smoke detectors that activate local alarms which may or may not activate in control rooms, depending on the configuration of the detection system.

**Fire Suppression Systems.** Halon is the primary suppression system in the processing areas. If halon is not capable of suppressing a fire, the foam suppression system serves as a back-up. Both systems are automatically activated by the fire detection system or manually activated by the control room operator. Foam suppression systems smother fires inside the crude oil storage tanks at the pump stations and the Valdez Marine Terminal. Sprinkler systems are installed at some support facilities.

**Fire Brigades.** The National Fire Protection Association 600, Standard on Industrial Fire Brigades, limits firefighting duties to one of four definitions. Most Alyeska technicians and base line support personnel are trained according to the Incipient Firefighting Duty standard.

1. **Incipient Firefighting Duties.** Fighting fires inside or outside of an enclosed structure or building when the fire has not progressed beyond the incipient or initial stage. An incipient fire brigade is expected to safely fight a fire in normal work clothing. Incipient firefighters are not required to crawl or take other evasive action to avoid smoke and heat, wear interior structural firefighting clothing, or use a self-contained breathing apparatus.
2. **Advanced Exterior Firefighting Duties.** Offensive firefighting performed outside of an enclosed structure when the fire is beyond the incipient stage. Advanced exterior firefighting often requires fire brigade members to contain, control, and extinguish exterior fires, while wearing self contained breathing apparatus and firefighting clothing.
3. **Interior Structural Firefighting Duties.** Fire brigade members are able to perform offensive actions and fight fires wearing self contained breathing apparatus and firefighting clothing.
4. **Both Advanced Exterior and Interior Structural Firefighting Duties.** Firefighters meet the requirements of both advanced exterior and interior structural firefighting duties.

Alyeska trained their technicians and base line support personnel according to advanced interior and exterior structural firefighter duties until 1994. At that time Alyeska evaluated risk and firefighting needs, then reorganized staff to be trained for incipient firefighting duties.

Mutual Aid agreements were negotiated with the fire departments near some pump stations and the Alaska Department of Transportation and Public Facilities, to assist each other should a major fire occur. Pump Stations without a nearby public fire department must rely on their own personnel for immediate fire response. Each pump station and airport is equipped with a fire truck and an average of 500 gallons of water to fight an incipient fire. The Valdez Marine Terminal maintains a professional firefighter staff, consisting of a fire chief, assistant fire chief, and three professionally trained firefighters per shift. Several technicians are trained according to incipient standards to assist when needed.

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## Employee Protection

- **The Alyeska Corporate Safety Manual (SA-38) adequately addresses safety of the workers on TAPS equipment and facilities.** Alyeska is in compliance with the requirements of SA-38, however, some sections could use improvement.
- **Alyeska conducted major maintenance projects in a safe manner that minimized risk to workers.** Alyeska and its contractors employ a competent safety staff to minimize accidents and mitigate risks.

JPO looked at Alyeska's safety procedures and methods for sufficiency to meet corporate safety requirements. We selected five sections of SA-38 for inclusion in the CMP Safety Report. The five sections, Car Seals, Energy Isolation, Excavations, Forklifts, and Permit Required Confined Space Entry were based on employee concerns and the audits performed by QTC and Arthur D. Little, Inc. Through the assessment and surveillance process, JPO did not find any indication of recurring problems.

***Forklift Program.*** The JPO reviewed the forklift program requirements to determine if the safe operating standards found in SA-38, Section 2.3, had been implemented. The program review concluded that a forklift safety program has been developed and implemented. There were two isolated cases of administrative findings that have been resolved:

- One pump station did not have a system in place to make sure that only qualified individuals use forklifts. The keys remained in the ignition, so anyone, including unqualified personnel, could operate the machinery. The problem was corrected when the baseline supervisor assumed control of the keys to ensure that only qualified individuals use the forklift.
2. The daily forklift inspection record had not been signed for several days, yet the forklift was in use. Alyeska procedures required each operator to inspect the forklift condition before using it and document the condition on the forklift inspection record. JPO informed Alyeska and supervisors are now enforcing this procedure.

***Car Seal Program.*** Car seals provide a means of protecting the integrity of systems under pressure and are essential to safe operation of critical facilities and equipment. Car seals and car seal logs are used to ensure correct positioning of critical valves. The seal itself is a numbered, locking metal strap that attaches directly to a valve that normally remains stationary. Once secured in place, the valves are not moved from their open or closed position.

The process of precise valve positioning is essential to prevent creation of flammable mixtures or vapors within work areas, or create situations that could be a safety risk to workers. When a valve position must be changed during maintenance, the car seal is broken. The action is recorded in the car seal log Alyeska uses for tracking the use of car seals. Car seals help ensure both worker and pipeline system safety.

Alyeska's Car Seal Program was an audit action item (AAI) identified by the 1994 audits. JPO initially reviewed it and followed the CMP process from surveillance through resolution of the

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AAI. JPO conducted nine field surveillances to determine if Alyeska had implemented their Car Seal Program according to procedures in SA-38, Section 1.7.

The results of JPO's surveillance and subsequent assessment process led JPO to conclude that Alyeska has developed and implemented their Car Seal Program and the audit action items are not recurring. For example, the car seal logs that are used in accordance with SA-38 to track the status of car sealed valves at all times is an extra safety measure. Alyeska audits the car seal logs on a periodic basis to make sure the recorded information reflects the actual car seal and valve positions. Although JPO did not have findings, there was one observation that two valves at a pump station could be moved without breaking the car seal, which defeats the purpose of the car seal. The observation was reported to Alyeska and has been resolved.



**Figure 1.** The thin metal tags secured to the valves are car seals.

**Permit Required Confined Space Entry (PRCSE).** PRCSE is a systematic method of controlling personnel working in a confined space with a hazardous or oxygen deficient atmosphere. Minimum requirements and procedures for the safety and health of individuals who work in permit required confined spaces are established in SA-38, Section 1.2. JPO conducted nine surveillances of the PRCSE Program to evaluate three key elements at each operating pump station and the Valdez Marine Terminal: 1) management and supervision, 2) qualification of gas testing personnel, and 3) rescue team training. The results of JPO's surveillances and assessments indicated that a PRCSE program was developed and implemented. The program is in place and working, except for two administrative findings that were resolved:

1. One case occurred at a pump station when the safety employee's gas testing qualification and training were not documented. As a result, Alyeska audited the records of all safety personnel linewide and noted that this had not occurred elsewhere.
2. JPO reviewed several permits linewide and found one tank painting crew had not documented the rescue team members on their permit. Since this was an isolated case and the job was completed, no action was required.

**Energy Isolation.** Once referred to as "lock out, tag out," energy isolation is a procedure personnel follow to safely service or perform maintenance on electric, hydraulic, or other equipment that is taken out of service. Energy isolation procedures prevent equipment from being inadvertently turned on during maintenance. The procedure for energy isolation is specified by SA-38, Section 1.3. JPO evaluated whether an Energy Isolation Program had been developed and implemented at each operating pump station and the Valdez Marine Terminal, and if Alyeska was following the SA-38 procedures. JPO conducted nine surveillances, evaluating three key

elements: 1) isolation procedures, 2) periodic inspections, and 3) isolation devices. JPO verified that Alyeska had developed and implemented an energy isolation program in accordance with SA-38. These two findings were identified and resolved:



**Figure 3.** A valve locked and tagged.

1. At the Valdez Marine Terminal, technicians locked out equipment for maintenance without using a danger tag or entering the lock out status in the Clearance Order Log, the method for tracking systems that have been locked out. Personnel felt it wasn't necessary to tag and document short jobs that could be completed in one shift. However, SA-38 requires all locks to be tagged and entered in the Clearance Order Log. JPO notified Alyeska and they resolved the problem.



**Figure 2.** An electrical circuit breaker locked and tagged.

2. SA-38 also requires periodic reviews of the Clearance Order Logs, to track which systems have been locked out and verify whether these systems should remain locked out. JPO found that one pump station was overdue for their annual review of Clearance Order Logs. When JPO brought this to the attention of pump station personnel, the log review was completed.

**Excavations** - Excavation projects are high risk activities that are becoming more frequent as the pipeline ages. The purpose of most pipeline excavations is to check for and repair pipe corrosion or deformations. Excavations are inherently dangerous due to the potential of unstable or displaced earth materials caving in on workers. A cave in often results in a fatality. For this reason, worker safety during excavation projects is critical and strongly emphasized by the JPO. Methods for project personnel to safely enter and work in trenches are specified by SA-38, Section 1.6.

JPO conducted several field surveillances to evaluate the safety of two major excavation projects on TAPS, the Wilber Creek Corrosion Repair and Thompson Pass Pipeline Investigation. These projects were evaluated for safety performance due to the complexity and depth of the excavations.



Figure 4. Early stages of Wilber Creek pipeline excavation. Notice the slope of the hill.

The Wilber Creek corrosion repair was completed early in 1997. Excavation at this site was complicated by steep terrain and deep burial of the pipeline. After assessing the technical ~~identified and resolved~~ complexity of the Wilber Creek excavation, JPO obtained the expertise of an outside excavation consultant, Robert Carrier, from the Alaska Department of Labor, Division of Occupational Safety and Health to evaluate the safeguards and excavation activities at this site.

The Thompson Pass Pipeline Investigation Project took place during the summer of 1997. It too, was complex in that access to the excavation site was difficult and a major highway adjacent to the site could have created some traffic problems between highway users and project personnel. JPO did not find unsatisfactory safety conditions during either project and reported the results and conclusions in subsequent assessment reports.

## Hazard Abatement

- **Alyeska makes a concentrated effort to identify and abate hazards.**

A certain amount of risk exists in all work environments. The first step to abate hazards in the workplace is to identify the potential hazards and develop mitigation measures to prevent unexpected incidents. Alyeska developed three methods of abating hazards: 1) the Inspection Program, 2) hazard analysis, and 3) the Hazard Communication and Abatement Program.

**Inspection Program.** An inspection and abatement program was established in SA-38, Section 1.4. JPO surveillance found that monthly self inspections were conducted by facility supervisors, using a checklist developed with assistance of the safety and fire prevention staff. In addition to self inspections, safety and fire staff annually inspect Alyeska facilities. Hazards and corrective action were documented on inspection forms. All major projects had a safety professional assigned to ensure worker safety at the job site. The safety person made daily worker safety inspections, monitored work activities, and held safety meetings with project staff.

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**Hazard Analysis.** Alyeska uses three types of hazard analysis:

- 1 For large projects, Alyeska uses a formal risk assessment process required by SA-38, Section 16. JPO engineers frequently monitor formal risk assessments such as the Thompson Pass Pipeline Investigation.
2. Fault tree analysis is often used to evaluate operations of a system such as the Vapor Control and Recovery project at the Valdez Marine Terminal.
3. For small maintenance activities and design development, Alyeska uses a Preliminary Hazard Analysis process. This process involves people knowledgeable of the operation using computer software to analyze the possibilities of anything going wrong.

**Hazard Communication and Abatement.** This is a program to notify employees of known hazards and monitor the process of corrective action and is scheduled for evaluation in JPO's next CMP Safety Report.

## **Accident Reporting**

- **Supervisors investigate and report accidents in a proper and timely manner, obtaining assistance of Alyeska safety staff when necessary.** Alyeska accident rates are lower than the national average.

JPO evaluated Alyeska's accident reporting procedures, including the tracking of accident statistics, and how investigations were conducted in 1996-97. Alyeska accident reporting procedures are established in SA-38, Section 6, under *Incident Investigation, Analysis and Reporting*. These procedures comply with the Alaska Department of Labor Occupational Safety & Health requirements. JPO investigated the following five accidents and compared the results with Alyeska's documentation. Both results were in agreement and no trends were noted.

**May 23, 1996** - A crude oil storage tank at the Valdez Marine Terminal was being drained, cleaned, painted, and a new floor installed and cathodic protection added. Crews were cutting the fire deluge system to remove it when residual vapors ignited, resulting in a minor flash fire that was quickly extinguished by the fire watch. No injuries or damage occurred.

**August 21, 1996** - A pipe fitter was torquing bolts on the vapor recovery system piping at the Valdez Marine Terminal tank farm when he fell 25 feet from the scaffolding onto an 18-inch vapor control pipe and was seriously injured. This accident was investigated by an Alaska Department of Labor Occupational Safety and Health Compliance Officer. No violations were issued.

**January 31, 1997** - A manual pull station fire alarm at Pump Station 3 accidentally activated, causing the fire alarm to sound. The alarm activation also closed the pump station natural gas valve and triggered the Halon Fire Suppression System to release halon in the Gas Building. No injuries or damage occurred. However, the pipeline was idled for less than an hour.

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**March 5, 1997** - A contract employee was fatally injured while traveling the road between Pump Station 6 and Fairbanks. He entered a curve too fast for conditions and collided with an oncoming tractor trailer. As a result of this fatality, Alyeska security personnel began tracking the speed of Alyeska vehicles using a check-in/check-out procedure. Every driver is required to stop at each pump station security point between travel destinations. Security staff logs drivers in and out of pump station checkpoints and provides them information on road conditions.

**July 24, 1997** - A life line generator at Pump Station 1 failed internally resulting in a temporary power outage and a minor fire that was controlled by the Halon suppression system. No injuries occurred and damage was limited to the life line generator turbine and intake plenum.

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## Chapter 3. Employee Concerns, Audit Item Resolution and Electrical Safety

### Employee Concerns Relating to Safety

- **The number of employee concerns relating to worker safety have decreased.** JPO investigates and resolves employee concerns as they surface.

JPO investigated twenty-five employee concerns filed between January 1994 and December 1997. Seven concerns revealed hazards. Although the scope of this report covers 1996 and 1997 work activities, few safety-related employee concerns were filed during this time. JPO felt it was important to review the entire 1994-1997 time period and provide a brief summary of the situations and subsequent actions:

***Failure to Conduct a Safety Briefing*** - An Alyeska contractor hired two individuals to remove snow from the roof of a building at the Valdez Marine Terminal. The required safety briefing was not provided to snow removal personnel before work began. Alyeska safety staff stopped the work and made sure the training was then provided to the snow removal crew.

***Leaking Propane Tanks*** - Employees filed two concerns related to propane systems. The first concern pertained to a leaking propane tank at a Remote Gate Valve (RGV). Propane cylinders had been temporarily placed at the RGV and secured haphazardly to a fence. Employees fixed the problem by properly securing the propane cylinders next to the building at the RGV site. The second concern related to leaking RGV propane supply tanks. The causes for these leaks and the solutions were as follows:

- 1 Frost heave caused a breakage in the fuel lines between the propane tanks and the Ormat heaters in the RGV control building. Alyeska fixed the leaking RGV propane supply tanks by replacing the rigid fuel lines with flexible lines that move with frost heave.
- 2 Each Remote Gate Valve has two vaults that contain and conceal one propane tank, which fuels the power generator at the RGV site. In the Pump Station 5 area, the propane tank vaults filled with water and rusted the fuel pressure regulators, causing the propane to leak. The problem was solved by relocating the regulator to the top of the tank vault above the water level. Alyeska then inspected other RGV propane tanks linewide and found that this problem was confined to the Pump Station 5 area. JPO sampled 12 other tanks along the pipeline and agreed with Alyeska's conclusion that the problem was limited to the Pump Station 5 area.

***Safety Procedure for Deactivation of Fire Alarms*** - Two employees filed separate concerns on the same issue concerning an unmanned pump station control room while the fire alarm system was deactivated for maintenance. As a precaution, safety procedures require control room personnel to monitor security cameras for fire detection purposes and maintain radio contact with work crews when fire alarm systems are deactivated. An unmanned control room puts workers at risk since they would not be aware of a fire emergency. The control room operator was subsequently reprimanded.

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Unsafe Worker Housing - Alyeska contracted with a private camp to house employees during the Alaska Occupational Safety and Health, National Electric Code, Safety Compliance (ANSC) Project. Work crews noticed several hazards in the facility, including leaky heating fuel lines, disconnected fire alarm systems, and improper waste disposal. When the owner did not make the necessary repairs, the crews relocated to pump station housing.



**Figure 5.** A propane regulator at a Remote Gate Valve. Notice the corrosion.

**Ventilation in the Valdez Marine Terminal (VMT) Testing Laboratory** - While the ventilation system was being repaired in a Marine Terminal testing laboratory, lab technicians continued to work in the facility. Without a properly ventilated work environment employees could potentially be exposed to health hazards generated by products used in the laboratory. The ventilation system was repaired before a JPO investigation was completed. No injuries occurred.

## **Audit Item Resolution**

- **Audit items relating to worker safety are not repeating.**

In July and November 1993, Congressional hearings were conducted to examine safety and labor related issues on the Trans Alaska Pipeline System. As a result the Quality Technology Company was contracted by the Bureau of Land Management to assess pipeline integrity, safety, and management issues along TAPS. The owners of TAPS contracted with Arthur D. Little, Inc. in September 1993 to conduct an independent assessment of the pipeline. The combined audits revealed 4,920 deficiencies that needed correcting. The safety related audit items were mostly programmatic, (concerning process and procedures) rather than hardware related. In order to correct the programmatic audit items, Alyeska completely revised their Corporate Safety Manual.

The JPO conducted surveillances of five audit findings to determine if they were repeating: 1) Car Seals, 2) Energy Isolation, 3) Excavations, 4) Forklifts, and 5) Permit Required Confined Space Entry. These five areas were discussed in Chapter 2.

All safety related audit action items were corrected except two that are related to walking and working surfaces. One audit item pertains to walking and working surfaces inside the fence at the pump stations and the Valdez Marine Terminal; the other item pertains to walking and working surfaces outside the fence along the pipeline right-of-way. Examples of walking and working surface problems are stairs at improper angles, hand rails with pinch points, work platforms without railings, and ladders with unevenly spaced rungs. Alyeska applied for three variances, or waivers with the Alaska Department of Labor. Although the walking and working surface equipment at the Valdez Marine Terminal was not in compliance, it did not present a safety hazard to workers. The equipment had not been properly designed. The first two variances for the Valdez Marine Terminal have been approved and this audit action item will soon be closed.

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The third variance that Alyeska requested was rejected by the Alaska Department of Labor since remote gate valve and check valve walking and working surfaces are not under their jurisdiction. Alyeska then decided to make the necessary modifications at these locations to close this audit action item.

## **Electrical Safety**

As an aging pipeline, the Trans-Alaska Pipeline System experienced electrical problems stemming from inadequate grounding, overloaded cable trays, inadequate conduit and raceway supports, improper over-current protection, and outdated area classifications. Whistle blowers elevated these problems to Congress in 1993. Many considered these electrical deficiencies as worker and equipment safety issues. However, they are outside the scope of this CMP Employee Safety evaluation and will be addressed in JPO's CMP Maintenance Program Report.

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## Chapter 4. Future JPO Work Commitment

- **JPO will continue to monitor Alyeska's Employee Safety Program.**

JPO is committed to monitoring the safety of TAPS workers. As part of JPO's Comprehensive Monitoring Program, surveillance of the following selected sections of SA-38 are planned to assure TAPS stakeholders that Alyeska is effectively maintaining an Employee Safety Program.

**Accident Reporting** - There have been concerns that accidents are not being reported, possibly to keep from adversely affecting their end of year bonus. This year, JPO will evaluate accident reporting procedures and accuracy of accident reports.

**Crane Inspection Program** - JPO will evaluate the inspection process and standards used to inspect fixed cranes in the pump stations and the Valdez Marine Terminal.

**Hazard Communication and Abatement** - JPO will evaluate the effectiveness of known hazard communication and corrective action monitoring.

**Major Projects** - JPO will continue to monitor major TAPS projects for worker safety. Current scheduled projects include the Chandalar Corrosion Excavation project, repair of Check Valve 122, and the repair of Remote Gate Valve 80.

**Near Miss Program** - The audit process revealed that Alyeska did not track situations that were "near misses" or averted incidents. Since this was identified as an audit item, Alyeska has since implemented a new program that tracks these situations. JPO will review this new program.

**Open ANSC Issues** - JPO continues to monitor three remaining issues from the 1994 ANSC Project:

The upgrade of the Operation Control Center (OCC) walls at the Valdez Marine Terminal to a one-hour fire resistant rating. This project is important because the existing cables in the ventilation system have a different rating than their current use. Alyeska redesignated OCC as an electronic data facility, permitting the use of non-rated cables.

2. The Knock Out Building at the Valdez Marine Terminal Power Vapor Control complex does not have adequate ventilation for a Class I, Division II area classification as specified by the National Electrical Code. JPO is monitoring the ventilation system upgrade to ensure it meets the requirements for the area classification.
3. The VMT West Metering Manifold Building has the same problem as the Knock Out Building. The ventilation system does not meet the requirements for a Class I, Division II area classification. JPO is also monitoring this ventilation system upgrade to ensure it meets the requirements for the area classification.

**Safety Training of Oil Spill Workers** - JPO will evaluate what safety training is required for oil spill workers, how it is provided, and determine if the workers are properly trained. We will compare the results with the requirements of the oil spill plan in SA-38.

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***Sling Inspection Program*** - Slings are used to lift heavy loads and could fail, causing serious injury. The process of inspecting slings will be evaluated.

***Work Order Program*** - The work order program was previously selected as a safety aspect, but instead it will be included in the CMP Maintenance Program Report to be released in 1998.

## **Closing Summary**

Alyeska has made a good faith effort to implement an employee safety program that is effective in minimizing risk to personnel working on TAPS. The company has an impressive record of employee safety when compared to the oil and gas industry. JPO recognizes this, but will continue to closely monitor Alyeska's compliance with the safety stipulations of the grant and lease to assure stakeholders that Alyeska will maintain and continually improve their Employee Safety Program. Along with pipeline integrity and environmental protection, ensuring employee safety is one of the major goals of the Joint Pipeline Office.