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# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

July 7, 1976

MEMORANDUM TO THE PRESIDENT, THE WHITE HOUSE  
Through: James A. Cannon, Director  
Domestic Council

FROM: Secretary of the Interior

On November 16, 1973, the Trans-Alaska Pipeline Authorization Act was signed into law. The Act charged the Secretary of the Interior with the authority to make grants of rights-of-way and to determine the conditions to be attached to such grants. On January 23, 1974, Secretary Morton executed the agreement and grant right-of-way with the owners of the Trans-Alaska Pipeline System. Along with the grant of right-of-way, the agreement imposes strict administrative environmental and technical stipulations and procedures. The stipulations and procedures are designed to assure the performance of all activities associated with construction of the pipeline in a technically and environmentally sound manner. In some areas, they constitute far more stringent constraints than any other Federal statutes and regulations applicable to the safety and operation of the Trans-Alaska Pipeline. Our stipulations require that the engineering designs of the permittees be subjected to our intense scrutiny and review. They impose strict standards of pollution control, standards of erosion control, and requirements for revegetation of the disturbed areas. Specific standards are established for fish and wildlife. The stipulations further require all design materials and construction operations and maintenance practices employed in the pipeline system to be in accordance with safety-approved engineering standards. Specifically, the stipulations require radiographs of all mainline girth welds prior to placing the system in operation.

I have charged my Authorized Officer, Major General Andrew P. Rollins, to give oversight to the execution of all provisions and stipulations of our permittee agreement. Under General Rollins' oversight, Alyeska Pipeline Service Company, the construction agent of the owners



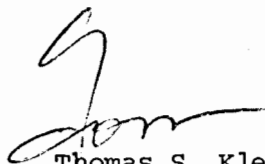
of the pipeline system, began an investigation in August of 1975 of certain welding irregularities. This investigation was enlarged in September and in October of 1975, expanded to include all welds executed thus far in Section 3 of the pipeline. This investigation of the welds executed in the construction season of 1975 was extended section by section until finally the last of the six sections was included at the end of January 1976. This investigation was completed and presented to members of my staff on May 4 and 5, 1976. During this investigation and "audit", Alyeska represented they had found 3,955 welds to be deficient either by presence of defects in the welds as reflected by radiographs or deficient by the absence of radiograph records. This number was determined after review of the 31,000 welds executed during the 1975 construction season. After a briefing on May 7, 1976, of the results of the Alyeska "audit", Under Secretary Kent Frizzell, immediately imposed upon Alyeska Pipeline Service Company their requirement that all welds executed hence forth must not be covered prior to written certification by Alyeska of their possession of a positive radiograph. This written certification was to be presented to our Authorized Officer. Further, we directed that Alyeska "audit" be validated. To this end, on May 24, 1976, we employed the accounting firm of Arthur Andersen & Company. Arthur Andersen & Co. discussed on June 30, 1976, with members of my staff and a representative of DOT the status of its validation effort.

In the simplest of terms, Arthur Andersen indicated they would be unable to certify the accuracy of Alyeska's audit due to serious procedural deficiencies in Alyeska's record keeping. That is, as Alyeska's records now stand, an independent auditor cannot attest to either the audit's accuracy or inaccuracy. Clearly, our stipulation requiring radiographic inspection has implicit in it the requirement of the maintenance by permittees of intelligible, auditable records by the permittees. A meeting is scheduled to take place in Los Angeles next Monday, July 12, 1976, between Arthur Andersen & Co., Alyeska Pipeline Service Company, and members of my staff to further define deficiencies in Alyeska's records maintenance. As has been our custom throughout the management of this project, we have extended an invitation to DOT to participate in this meeting. Following the meeting, we anticipate early receipt of Arthur Andersen & Company's final report. Upon receipt of such report, we intend to direct Alyeska Pipeline Service Company to take all necessary steps to bring their records of all pipeline welds, and radiograph inspections of such welds, to a level acceptable to our independent auditor.

There is a second facet to the welding problem. Over 200 of the welds executed in 1975 were found to be buried without radiographic inspection records. Alyeska Pipeline Service Company has embarked on a means of inspection of these welds employing accoustical imaging, a method of inspection utilizing ultrasonic testing techniques to create an image of the defects in such welds. They have requested

our oversight of their development of this technique and requested our acceptance should they prove to our satisfaction that it is indeed a means of inspection alternate and equivalent to radiographs. To this end, tests are presently scheduled in Fairbanks next week to demonstrate the effectiveness of this testing method. Again, we have extended an invitation to the DOT to witness these tests. Certain of the welds determined to be deficient by virtue of defects present within the welds lie buried beneath rivers or deep in permafrost, making access to them for inspection and repair extremely difficult and potentially damaging to the environment. Alyeska proposes to address the sufficiency of these welds by rigorous mathematical analysis employing fracture mechanical analysis and, to this end, has conducted elaborate tests to determine the acceptability of various defects in the sizes within the welds. To assist us in the oversight of this program, we have retained a nationally eminent welding metallurgist as well as the services of Southwest Research Institute, one of the leading centers of pipe welding expertise. Again, we have invited DOT to participate with us in this endeavor.

We have indicated to the permittees that the initiation of operations of the pipeline will not be permitted until such time as we are fully assured of the integrity of each weld in the pipeline. With this knowledge, Alyeska has in turn told us that they do not anticipate a consequential delay in the pipeline. We are treating this matter with the greatest sense of urgency and with all available resources. We shall keep you informed of the steps taken to solve the welding problems.



Thomas S. Kleppe

## TRANS-ALASKA PIPELINE WELD PROBLEMS

### Chronology of events since May 1975

August, 1975--Surveillance by Interior Department and its special consultant, Mechanics Research, Inc., reveals quality control problems in girth (circumferential) welds joining pipeline lengths.

August, 1975--Alyeska Pipeline Service Company begins audits of X-rays in two sections of the pipeline. Irregularities, including possible falsification of some X-rays, are found.

September 11, 1975--At his request, Interior Under Secretary Kent Frizzell holds meeting with principal owners of the pipeline system; the owner companies assure Interior of their intentions "to improve quality control program and to do so with a sense of urgency."

September, 1975--Alyeska undertakes a more extensive X-ray audit, section by section, on a 100 per cent audit basis.

Winter, 1975-76--Audit is extended and continued as work on welding ends for the season.

May 4-5, 1976--Alyeska presents X-ray audit to Interior Officials showing that of more than 30,000 girth welds made in 1975, a total of 3,955 require examination and possible corrective action.

May 7, 1976--Under Secretary Frizzell telegraphs Alyeska, pointing out that Interior stipulations require satisfactory X-rays of all girth welds before the pipeline can be put into operation. His message demands that the company state specifically how it intends to meet this requirement. It directs Alyeska to supply written, detailed evidence of procedures to prevent future deficiencies; and it directs that all girth welds henceforth be left exposed until an X-ray of each has been obtained and certified in writing.

May 24, 1976--Interior engages Arthur Andersen & Co., independent CPA firm, to validate Alyeska's audit of its 1975 welding program. Interior also employs W. A. Saylor, independent metallurgical expert, and Southwest Research Institute, independent center of welding expertise, to help analyze problem welds.

May 27, 1976--Alyeska's owner companies tell Interior they are moving as quickly as possible to re-examine and repair problem welds. (By June 21, some 1,700 of the 3,955 welds identified as questionable by Alyeska audit have been brought into compliance with Interior stipulations.)

June 7, 1976--Alyeska outlines means by which it proposes to comply with Interior stipulations, pointing out that there are no X-rays for more than 200 welds, some of them in joints buried beneath rivers or deep in permafrost. Alyeska inquires whether Interior would consider "alternative equivalent" examination techniques in place of X-rays.

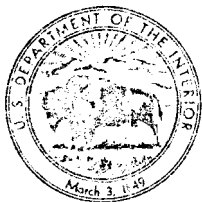
(more)

June 11, 1976--Frizzell says Interior is willing to review "alternative but equivalent" inspection methods, without committing itself to acceptance of such methods. A test is scheduled for Fairbanks in mid-July of acoustical holography --obtaining pictures by sound wave, a technique that has been used on weld examination, but yet to be proven sufficient under actual field conditions inside a pipeline.

June 30, 1976--A briefing is held by Arthur Anderson & Co. for members of the Secretary's staff of the firm's efforts to validate Alyeska's audit.

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(prepared July 1976)



# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

July 7, 1976

## NOTE TO THE PRESIDENT

From: Secretary of the Interior

### SUMMARY

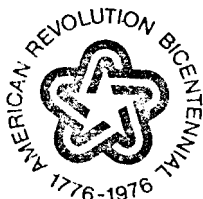
The Department's plan for resolving the questions which have been raised with respect to the quality of welds on the Trans-Alaska Pipeline is as follows:

First, our independent auditors, Arthur Andersen & Co., in conjunction with the Alyeska Pipeline Service Co., will verify the authenticity and accuracy of all welding records presently in existence.

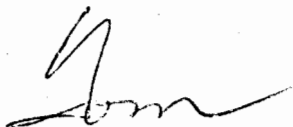
Second, in those cases where welding records indicate deficiencies those deficiencies will be repaired where access can be gained to the weld without undue damage to the environment. In those instances where the weld is located in permafrost or beneath rivers and streams where considerable environmental damage could result from digging up the pipe, independent testing by recognized welding experts will determine through a system of fracture mechanics analysis whether any deficiencies present will actually affect pipeline strength and integrity. If pipeline strength and integrity are affected repairs will be made to the pipe in place or if necessary the pipe will be removed for repairs.

Third, in those instances where no records exist with respect to welds, new radiographs will be made where possible. Where the welds are not accessible for radiographs we have asked an independent team of recognized welding experts to determine whether a new system of acoustical imaging will accurately and thoroughly assess the integrity of those welds. In the event this alternative method of testing is determined to be reliable it will be utilized. Welds found to be insufficient by these tests will also be repaired.

Operation of the Alaska Pipeline will not be permitted to begin until we have assured ourselves through the best engineering techniques available that the structure and welds of this pipeline are in full compliance with our high standards to assure the complete integrity of this pipeline.



We cannot say at this time what, if any, delays will be encountered in the completion date of the Alaska Pipeline. We are hopeful that the pipeline can be brought into operation by its scheduled completion date of July 1977, however, our primary objective will be to assure ourselves of the integrity of the pipeline.



Secretary of the Interior

Attachment





THE SECRETARY OF TRANSPORTATION

WASHINGTON, D.C. 20590

July 7, 1976

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Welding Problems on the Alaska Pipeline

On July 2 you requested the Department of Transportation (DOT) to submit to you today a preliminary report concerning welding problems in the construction of the Trans-Alaska Pipeline System (TAPS).

At the outset I would like to describe in general terms the past role of DOT in the oversight of the design and construction of the pipeline.

Under the authority of the Transportation of Explosives Act (18 USC 831-35), DOT has established safety regulations for the design, construction, operation and maintenance of pipelines operated by carriers engaged in interstate commerce which transport liquid hazardous materials, including petroleum and petroleum products (49 CFR Part 195). These standards apply to TAPS. DOT's responsibilities with respect to pipelines are handled by the Office of Pipeline Safety Operations (OPSO), which is an element of the Department's Materials Transportation Bureau (MTB).

In 1969 the Alyeska Pipeline Service Company (Alyeska) applied to the Department of the Interior (DOI) for right-of-way permits across Federal lands. In early 1974 Alyeska and DOI executed an Agreement and Grant of Right-Of-Way which, among other things, stipulates that Alyeska shall design, construct, and operate the pipeline in accordance with DOT safety standards. DOI established an Alaska Pipeline Office (APO) and assumed the primary Federal responsibility for the project. DOI provided a large inspection force to monitor the construction of the pipeline. DOT determined that it would be a duplication of Federal resources if it were to establish a special field inspection force for TAPS since we were assured that DOI was devoting adequate resources to ensure that the pipeline was constructed in accordance with DOT pipeline safety standards, as well as in accordance with the stipulations in the DOI-Alyeska agreement.

DOT and DOI agreed that during the construction of the pipeline, DOT would supplement DOI's monitoring activity to the degree necessary to assure compliance with DOT regulations and that DOT would provide needed technical support. In this regard, DOT served as a member of DOI's Technical Advisory Board, which was established as part of a DOI task force on Alaskan oil development. DOT provided technical advice to DOI concerning the design and construction of the pipeline, as well as the development of the environmental impact statement for the pipeline, and committed a staff engineer in Washington, D.C., to serve as coordinator of DOT activities.

Statistics compiled by OPSO demonstrate that the chief cause of leaks for both oil and gas pipelines throughout the country has been corrosion, not welding. Indeed OPSO statistics indicate that less than 2 percent of the liquid pipeline failures have been attributable to girth weld failures, and therefore they were not a subject of primary concern to DOT. DOT activity has focused primarily on the corrosion control plan for the pipeline. DOT has also been concerned with the structural design of the pipeline as well as approval of a valving plan to be used in compliance with a DOT regulation.

DOT first became aware of possible welding irregularities in early September 1975 when Peter Kelley brought suit against his former employer, Ketchbaw Industries. Ketchbaw Industries was the contractor providing radiographic inspection of girth welds on pipeline construction south of the Yukon River. Mr. Kelley alleged that Ketchbaw crews had falsified some radiographs.

Alyeska dispatched an audit team to check Mr. Kelley's complaint and subsequently conducted an audit of radiographs made of all girth welds in Section 3 (the project is divided into five construction sections). On September 14, 1975, Alyeska decided to audit all radiographs in the other sections south of the Yukon based on preliminary findings in Section 3. Eventually the audit was expanded to include the sections north of the Yukon. The audit involved two aspects: (1) all radiographs taken in 1975 (approximately 30,800) were read and reinterpreted and (2) identifying features of each of the radiographs were put into a computerized data bank in order to isolate, by a "fingerprinting" process, potentially duplicated radiographs which might be falsifications.

OPSO received the audit report for Section 3 on October 31, 1975, and the audit report for Section 2 on January 30, 1976. A review of these two reports indicated that there were irregularities in the radiographic inspection of welds. About the time of the receipt of the first report, we were advised that the audit would extend to the entire pipeline.

Shortly after receipt of the first audit report, the welding of the pipeline was halted for the winter and was not resumed until the spring of 1976.

During the last week in March 1976, DOT learned that the audit was nearing completion and that a large number of welds had been found to be irregular. This was confirmed by Mr. Rollins of APO by telephone on April 7, 1976. Based on this information, DOT forwarded a letter on April 9, 1976, to Mr. Rollins indicating the necessity of a meeting to discuss these irregular welds, and another letter to Mr. Ed Patton, President of Alyeska, expressing concern over the welding issue and requesting a meeting to ascertain the full dimensions of the problem and to be informed of Alyeska's course of corrective action.

On May 4 and 5, 1976, Alyeska conducted a meeting in its office in Anchorage to present and discuss the results of the complete audit. The meeting was attended by representatives from OPSO, APO, the State of Alaska, and various consultants from the Department of the Interior. Alyeska presented the summary and analysis of the audit. This summary showed that there was a total of 3,955 welds with irregularities that included missed radiographs, falsified radiographs, and welds with defects not acceptable under 49 CFR 195.228.

On May 27, 1976, Deputy Secretary John W. Barnum and Mr. James T. Curtis, Jr., Director of MTB, attended a briefing concerning the radiograph problem arranged by Under Secretary of the Interior Frizzell and conducted by Alyeska and the companies who own the pipeline.

On June 21, 1976, John Barnum testified before the House Interstate and Foreign Commerce Subcommittee on Energy and Power regarding the construction problems on the TAPS. At that time, in addition to describing DOT's past actions, he indicated that we would furnish a full report to that

Subcommittee on future DOT action plans for resolving the welding problems and monitoring the continuation of the construction of TAPS. As promised, that report has been delivered. At my request Mr. Barnum has also responded to a letter from Senators Jackson and Metcalf on the same subject.

In the interim DOI retained Arthur Andersen and Company, an independent certified public accounting firm, to validate Alyeska's audit of their 1975 welding program. A report of their preliminary results was made available to us on July 1, 1976. We understand that a final report will be available shortly.

The issues regarding the welding and monitoring problems can be categorized as follows:

- Issue No. 1: The first issue concerns welds performed during the 1975 construction season which, upon reexamination by the auditors for Alyeska Pipeline Service Company (Alyeska), are acknowledged not to meet the specifications in the DOT regulations. The DOT regulations require welds to meet the standards specified in Section 6 of American Petroleum Institute Standard 1104 (API 1104). The majority of the welds identified by Alyeska as not complying are welds which do not meet the API 1104 standards because of size or type of defect.
- Issue No. 2: The second issue concerns missing, incomplete, or otherwise defective radiographs of welds performed during the 1975 construction season. The DOT regulations in 49 CFR 195.234(a) permit welds to be nondestructively tested in any manner that will clearly indicate any defects that may affect the integrity of the weld. The DOI Agreement and Grant of Right-of-Way in Stipulation 3.2.2.3, however, requires that all main line girth welds be radiographed.
- Issue No. 3: The third issue concerns assuring that the construction of the remainder of the pipeline complies with DOT requirements.

With respect to the first two issues, DOT is requiring Alyeska to submit to DOT a plan and schedule for correcting the weld deficiencies identified in its audit of the 1975 girth weld radiographs. DOT will require satisfactory verification of Alyeska's corrective action. If the Alyeska audit has not identified all of the existing girth weld irregularities, DOT will require a supplemental plan and schedule for correcting all additional irregularities. In addition, DOT is taking the following actions to resolve these issues:

Welds not in compliance with DOT regulations:

The position of DOT is that all welds must meet DOT standards for pipeline integrity. Welds which do not comply with DOT regulations must be repaired. If an alternative standard of weld acceptability which will not adversely affect the integrity of the pipeline is established through DOT's formal waiver process, all problem welds will be individually evaluated using this newly established standard.

Although DOT has not received a formal application for a waiver of the API 1104 standards for those welds, Alyeska in a letter to DOI has stated that there is under development a program to establish an alternative standard to API 1104 which may prove to be satisfactory for testing the acceptability of welds that are "located in sensitive and/or very difficult access related areas in which any remedial work will likely degrade the end product quality and/or create substantial environmental concerns." Since the evaluation of any alternative standard will require the analysis of complex technical issues, DOT has retained the National Bureau of Standards (NBS) which, together with personnel within DOT, will monitor the development of and evaluate this possible alternative standard of acceptability to API 1104.

Defective or missing radiographs:

Alyeska has proposed to employ a new technique to inspect welds in critical areas which have missing, duplicated, or otherwise defective radiographs. This new technique is called acoustic imaging. It uses

ultrasonic energy to produce an optical image or picture of the weld being inspected. The advantage of the acoustic imaging inspection technique would be that only the inside of the weld has to be exposed. In radiography, the radiation source and the film must be on opposite sides of the weld, which means that a buried weld must be exposed by excavation in permafrost or by pulling pipe out from under a riverbed. The acoustic inspection device would be used to inspect the welds from inside the pipe.

On May 27, 1976, a laboratory demonstration of the acoustic imaging system was conducted in Richland, Washington. Representatives from DOI, the State of Alaska, and DOT attended the demonstration. Significant technical questions regarding the system remained unresolved at the conclusion of the Richland tests. Alyeska plans to conduct further tests, under field conditions, in Fairbanks, Alaska, commencing the week of July 12. NBS will also assist DOT in the resolution of this issue. DOT representatives and NBS ultrasonics and acoustical imaging experts will attend the Fairbanks tests and subsequently we will determine whether the technique can identify weld defects in a manner equivalent or superior to radiography.

#### Future construction:


Due to the developments which indicate falsification of the records that determine compliance with DOT regulations, we have reexamined our earlier commitment of personnel and resources to the fulfillment of our specific responsibilities regarding the construction of the TAPS. As a result, we have concluded that the Department should be represented on the TAPS project in Alaska on a continuous basis and we have this week initiated continuous onsite surveillance by OPSO personnel to assure compliance with our regulations and to maintain liaison with the APO concerning their surveillance functions.

To supplement the increased OPSO efforts, we will assign five additional Departmental personnel to Alaska to assist in the monitoring of the welding

operations, including the radiographing of welds and weld repairs. This activity is not intended to duplicate the function being performed by APO, but will be essentially an oversight function to assure compliance with DOT regulations.

The DOT task force in Alaska will be supervised by Rear Admiral Joseph R. Steele (USCG Ret.), who is being briefed in Washington today and tomorrow and who will proceed to Alaska on Friday. Admiral Steele has a solid technical and management background, has a long and distinguished career in the Coast Guard and has spent three years in Alaska.

On Sunday (July 11), in accordance with your instructions, John Barnum will go to Alaska with a team of DOT pipeline, metallurgy and environmental experts. He will also be accompanied by a representative of the Federal Energy Administration. In Alaska he plans to meet with Governor Hammond and other officials of the State of Alaska, with representatives of DOI and Alyeska, and with our own task force and consultants, among others. The fact-finding team will attempt to assess the implications of the welding problem in terms of delays, any additional costs in construction of the pipeline, and any environmental impact. Alyeska testified in the House hearings that the approximate cost of correcting the problem welds would be \$35 to \$55 million, depending on the development of acoustic imaging equipment and the requirements of DOI and DOT for correcting the problem welds. Alyeska also testified that it did not think that there would be any delay in completing the project as a result of these problems. We are not presently in a position to comment on those statements, but will address those questions in the report we submit to you following John Barnum's visit to Alaska.

  
William T. Coleman, Jr.

7/7/76

Mr. Linder:

As you will note, the original was sent to the President thru Mr. Cannon.

This is just an info copy.

Katie

Copy should be returned to Trudy.