



A/T-32

MUN-736
Page 1 of 15

State and Federal Applications for Renewal of the Trans Alaska Pipeline System

©2001 Trans Alaska Pipeline System Owners

Notice on Revisions

The contents of this electronic file are subject to revision without notice to individual holders. However, revisions will be placed on the TAPS Right-of-Way Renewal web site at www.tapsrow.com. Please visit the web site to ensure that you have the current version.



DURATION OF RIGHT-OF-WAY RENEWAL

for the
Trans Alaska Pipeline System

March 23, 2001

Trans Alaska Pipeline System Owners

DURATION OF RIGHT-OF-WAY RENEWAL FOR THE TRANS ALASKA PIPELINE SYSTEM

March 2001

© 2001 TRANS ALASKA PIPELINE SYSTEM OWNERS

IMPORTANT NOTE

The authors of this report have made every effort to gather complete and accurate data for their analysis. Projections of future TAPS throughput and configuration, North Slope oil development, gas commercialization, and tanker transportation are necessarily dependent on assumptions about oil and gas production, future technology, and the facilities and equipment needed. The authors' assumptions represent informed projections based on knowledge of current operations and are not meant to imply that these predictions completely and accurately reflect all future scenarios pertaining to TAPS, North Slope oil and gas development, or tanker transportation. Actual outcomes are dependant on many variables including the economics of oil and gas production, changing laws and regulations, and political realities, and may differ significantly from those predicted here.

5. Useful Life of the Trans Alaska Pipeline System

Useful life is one of the three primary elements for establishing the duration of the federal and state rights-of-way. For purposes of this document, *useful life* is defined as a combination of *design life*, *physical life*, and *economic life*. The useful life of TAPS can be portrayed as the period during which the pipeline provides a safe, environmentally sound, economically viable transportation link to get Alaska North Slope crude oil to market.

TAPS useful life will continue well beyond the maximum allowable 30-year right-of-way renewal because:

- TAPS design life is based on the incorporation of robust components and the accommodation of repair, replacement, and state-of-the-art updating strategies, including system monitoring and environmental protection methods designed to counteract aging and time factors.
- TAPS physical life is considered virtually unlimited given the execution of appropriate surveillance, maintenance, repair, and replacement programs. TAPS was constructed, and is maintained, to ensure its integrity well in excess of the proposed 30-year renewal term.
- TAPS economic life is governed by the extent of recoverable North Slope crude oil reserves. Predictions show these reserves being produced in quantities sufficient to support the continued operation of the pipeline well beyond 30 years.

The succeeding sections discuss, in turn, design life, physical life, and economic life in more detail.

5.1 Design Life

Engineers developed design criteria for TAPS based on assumptions that protection of the Alaska environment was paramount and that, as the only oil transportation link to Alaska's North Slope, the pipeline had to function reliably and safely, with sufficient structural integrity to resist arctic conditions over an indeterminate period. These significant technical challenges resulted in a design that incorporates many redundancies and safety factors to account for known and unpredictable future conditions. The

pipeline design was intentionally robust, and 25 years of operation have provided the opportunity for a critical evaluation of the design assumptions and features. That evaluation has confirmed that the design decisions were correct.

Key TAPS design features addressed technical challenges such as support of a warm-oil pipeline in permafrost (Figure 3) and seismic risks to pipeline integrity. Design elements included assumptions and features that anticipated the effects of aging, such as:

- Estimates of thaw settlement allowances for buried pipeline segments,
- Pipe movement allowances in the above-ground design to provide for crude-oil temperature changes over time, and

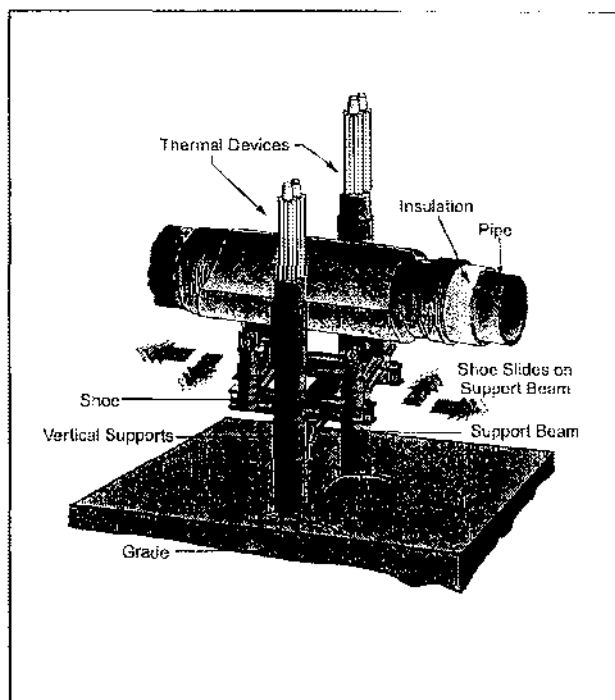


Figure 3. Approximately half of the pipeline is supported on specially designed supports to ensure the integrity of the warm-oil pipeline in permafrost. The supports consist of crossbeams installed between vertical support members placed in the ground. The above-ground pipe is insulated, jacketed with galvanized steel, and mounted on a teflon-coated shoe that can slide back and forth on the crossbeams.

- Soil creep or frost jacking at above-ground pipe supports.

TAPS performance is evidence that the design tolerances and protective features have been more than adequate to meet the challenges. Pipeline integrity has been stable, and age-dependent issues have been manageable over time. Butressing the design features are surveillance and monitoring programs that continually assess the viability and functioning of the system and gauge the status of the pipeline system against the original design standards. Maintenance and repair programs keep TAPS in a safe, reliable state that protects the surrounding environment from adverse impacts from TAPS operations.

While some early statements regarding the intended service life of the pipeline estimated 30 years, in fact the pipeline design was not based on retirement or cessation of operations 30 years from the start of operations in 1977. These statements are derived from original estimates of the life of the proven Prudhoe Bay field reserves (Norman, 1971), which were used to justify the field owners' decision to proceed with TAPS construction. However, given the size of the Prudhoe Bay field, the possibility of further North Slope discoveries, and the consequences of a design failure, the pipeline was designed and built so that it could be physically operated indefinitely while meeting all safety and environmental criteria. Of course, Prudhoe Bay has produced far more reserves and has a far longer life span than originally predicted. Moreover, other significant North Slope fields have been, and still are, being developed. The original design goal — to incorporate features which would facilitate a virtually unlimited useful life of the system — was well selected.

In fact, the initial duration of the Federal Grant and State Lease was set at 30 years because that was the maximum period allowed by law, not because of any concern that the pipeline system would not last longer than 30 years.

5.2 Physical Life

TAPS physical life will last as long as the integrity of the pipeline and facilities is maintained adequately to allow continued safe and environmentally sound transport of crude oil. Alyeska possesses one of the industry's most rigorous maintenance programs, key aspects of which are continual monitoring and replacement of TAPS components, where advisable, either to ensure system integrity or to take advantage of technological improvements and efficiencies. Just one indication of the massive nature of that program is the approximate \$25 million to \$50 million

spent each year to detect and control corrosion.

TAPS is proven to be reliable — from July 28, 1977, through December 31, 2000, the pipeline operated for over 204,000 hours and was shut down for a total of only 852 hours, giving it a reliability rate of 99.6 percent. The pipeline also has an excellent performance record with respect to leaks — since startup, over 13 billion barrels of crude have been transported, with only 5 major leaks (i.e., greater than 1,000 barrels) on the mainline pipeline totaling approximately 23,500 barrels, one-half of which occurred through a single sabotage incident at Steele Creek. The expectation is that these results will be improved on in the future, given diligent upkeep and further developments in such areas as smart pigs and leak detection technology which Alyeska has pioneered in past years.

Since startup of TAPS in 1977, Alyeska has continued to improve and expand its initially comprehensive programs to detect and repair potential problems that might threaten the integrity of the pipeline system. Alyeska has developed innovative, state-of-the-art methods to monitor the condition of the pipeline and associated facilities. Where corrosion, settling, or other problems have been detected, prompt repairs — including the replacement of several sections of mainline pipe — have been made. These programs verify that the initial design specifications and construction methods were robust and lasting even in harsh arctic conditions.

In addressing TAPS longevity, it is useful to compare the TAPS operating period with that of other pipelines. These comparisons reveal that pipeline age is not a reliable indicator of pipeline operating risk — assuming good design and maintenance. A number of pipelines have been in good operating condition for more than 50 years (Muhlbauer, 1996).

A study of Cook Inlet, Alaska, oil pipeline performance performed by the Alaska Department of Environmental Conservation (ADEC) noted (Visser et al., 1993):

The fact that the pipelines have reached their original design life does not imply that the lines have become inadequate or unsafe. The integrity of an older pipeline is a function of how well the line has been maintained, the type of throughput, and how the current operating conditions compare with the original design conditions. With proper maintenance the remaining life of a pipeline can be several multiples of the original design life.

Appendix 2 discusses pipeline longevity studies, potential age-related threats to pipeline integrity, and measures to mitigate those threats.

5.3 Economic Life

The economic life of TAPS is essentially determined by whether there is sufficient North Slope crude oil economically available to justify continued operation of TAPS. It is clear that there is more than enough physically recoverable oil to continue to operate TAPS through the 30-year renewal period.

U.S. government and State of Alaska predictions of North Slope oil production show that, although production from current fields will continue to decline, by 2020 production will level off in the range of 500,000 barrels per day until the end of the period in 2034.¹⁶ These conservative estimates are based principally on well-established decline curves for existing fields¹⁷ and on a small increment in future production to be supplied by increased production from existing fields and by production from very modest discoveries. The estimates do not include the assumption that any oil will be produced from new major discoveries or from areas that are currently closed to exploration and production. More than sufficient economically recoverable oil is available to support the operation of the pipeline beyond 30 years.

¹⁶ Appendix A of the draft *Environmental Report for Trans Alaska Pipeline System Right-of-Way Renewal* (TAPS Owners, 2001) contains a detailed analysis of TAPS throughput assumptions. In addition, recent estimates by the Alaska Department of Revenue predict North Slope production will exceed 1 million barrels per day through 2010 — the last year of the Department of Revenue analysis.

¹⁷ Oil fields customarily have long production "tails," that is, they produce at reduced, but stable and predictable levels for a long time. These predictable tails will supply the basic level of TAPS throughput over the next three decades.

Currently, TAPS throughput is about 1 million barrels per day (bbl/day). At pipeline startup in 1977, throughput was about 300,000 bbl/day, and at peak operation in 1988, throughput was over 2 million bbl/day. Two conclusions can be drawn from this operating experience: 1) TAPS has already operated in the throughput ranges expected during the duration period, and 2) since throughput has decreased by over 1 million bbl/day in 12 years, dealing with an additional decline of 700,000 bbl/day in the next 30 years is well within technical and operating abilities.

Alyeska has made, and continues to make, changes to accommodate lower throughput. There is no expectation that these changes — or those needed to reach even much lower levels — would be determinative or critical in deciding whether to keep TAPS open. At some point, obviously, it would be both physically and economically impossible to continue to operate TAPS. That level is indeterminate, but is much lower than any reasonably anticipated throughput expected during the proposed 30-year renewal period.

Moreover, since TAPS is the only existing method to transport Alaska North Slope crude oil to market, it is very likely that the oil-producing companies and the State of Alaska, as a royalty owner, would favor the long-term duration of TAPS to avoid stranding significant quantities of crude oil in the earth. The history of technological change in both the pipeline and oil exploration and production industries provides reason for optimism on this score. Innovation, coupled with reduced costs, have meant that both pipeline transportation and the finding and extraction of oil have been steadily improved.



11. Conclusion: Justification for 30-Year Right-of-Way Renewal

One of the key variables in the right-of-way renewal decision is the length of the renewal period. This report indicates that TAPS can, and is expected to, continue operating as a crude oil pipeline and remain economically viable for at least 30 more years. TAPS well satisfies the useful life, public purpose, and cost criteria for a long-term renewal. Federal law and, with modification, state law will permit a 30-year renewal period. Since there are strong rea-

sons for a maximum-term renewal, the length of the renewal term should therefore be set at 30 years to accommodate the transportation of remaining economically recoverable North Slope crude oil to market, supporting, in the bargain, the economic and strategic interests of the nation and the State of Alaska. Just as 30 years was the appropriate term in 1974, it also is the appropriate term now.

*Renewal
of the
Agreement and Grant of Right-of-Way
for the
Trans-Alaska Pipeline and Related Facilities
between
The United States of America
and
Amerada Hess Pipeline Corporation,
BP Pipelines (Alaska) Inc.,
ExxonMobil Pipeline Company,
Phillips Transportation Alaska, Inc.,
Unocal Pipeline Company, and
Williams Alaska Pipeline Company, L.L.C.*

2003

RENEWAL
of the
AGREEMENT AND GRANT OF RIGHT OF WAY
for the
TRANS-ALASKA PIPELINE SYSTEM
AND RELATED FACILITIES

This Renewal of the Federal Grant and Related Facilities ("Renewal") is made and entered into this 8th day of January, 2003 by and between the United States of America ("United States"), acting through the Secretary of Interior, and Amerada Hess Pipeline Corporation, BP Pipelines (Alaska) Inc., ExxonMobil Pipeline Company, Phillips Transportation Alaska, Inc., Unocal Pipeline Company, and Williams Alaska Pipeline Company, L.L.C. (collectively "Companies" or "Permittees") whose mailing address is Alyeska Pipeline Service Company, 1835 South Bragaw, MS 569, Anchorage, Alaska 99512. The United States and the Companies are sometimes referred to individually as a "party" and collectively as the "parties."

WHEREAS, the Companies, current holders of the rights of way for the Trans-Alaska Pipeline and its related facilities, as set forth below, have requested renewal of the January 23, 1974 Grant of Right-of-Way for the Trans-Alaska Pipeline, as amended ("Federal Grant"), the serial numbers, legal descriptions, and other pertinent data for which is set forth in Exhibit A Part-I hereto, and renewal of the grants for related facilities and other associated rights ("Related Facilities"), the serial numbers, legal descriptions, and other pertinent data for which is set forth in Exhibit A Part-II hereto;

WHEREAS the Secretary of the Interior has authority under the Trans-Alaska Pipeline Authorization Act of 1973, 43 U.S.C. § 1652, and section 28 of the Mineral Leasing Act, as amended, 30 U.S.C. § 185, to act upon the applications for renewal;

WHEREAS the Secretary has determined that the requirements for renewal of the Grant and Related Facilities have been met; and

WHEREAS the parties recognize and acknowledge that the State of Alaska has renewed all rights and interests held by the Companies in the Right-of-Way Lease, ADL 63574, and associated rights for the Trans-Alaska Pipeline;

NOW, therefore, the parties agree that:

- A. The Federal Grant and Related Facilities are renewed for the maximum term authorized by law, thirty (30) years.
- B. It is the intent of the parties that all rights and interests administered by the Department of the Interior held by the Companies are included within this Renewal. The parties shall take such reasonable actions, and execute and deliver any further instruments, agreements, documents, or other papers, as are reasonably requested by either party to affect this intent.
- C. This Renewal of the Federal Grant and Related Facilities is granted unto the Companies in their undivided interests, as follows:

Amerada Hess Pipeline Corporation, an undivided interest of 1.5000% of the whole;
BP Pipelines (Alaska) Inc., an undivided interest of 46.9263% of the whole;
ExxonMobil Pipeline Company, an undivided interest of 20.3378% of the whole;
Phillips Transportation Alaska, Inc., an undivided interest of 26.7953% of the whole;
Unocal Pipeline Company, an undivided interest of 1.3561% of the whole; and
Williams Alaska Pipeline Company, L.L.C. an undivided interest of 3.0845% of the whole.

D. Section 7(A) of the existing Federal Grant is amended to read as follows:

The grant of the Right-of-Way as originally issued began on the 23rd day of January, 1974 and as renewed continues from the 22nd day of January, 2004, at noon, Washington, D.C. time, and shall come to an end and expire on the 22nd day of January, 2034, at noon, Washington, D.C. time, unless prior thereto it is relinquished, abandoned, or otherwise terminated pursuant to the provisions of this Agreement or any applicable Federal law or regulation.

E. The Exhibits that are attached to this Agreement and that are listed below in this subsection are, by this reference, incorporated into and made a part of this agreement as fully and effectually as if the Exhibits were set forth herein in their entirety:

- Exhibit A: The Federal Grant dated January 23, 1974 (including its existing Exhibits C, D, and E which remain unchanged by this Renewal.)
- Exhibit A-Part I: The Legal Descriptions for the Federal Grant of Right-of-Way F-12505 and AA-5847 (which, with Part II below, replace in its entirety the original Exhibit A to the Federal Grant);
- Exhibit A-Part II: The current Legal Descriptions for the grants for Related Facilities (which, with Part I above, replace in its entirety the original Exhibit A to the Federal Grant); and
- (4) Exhibit B: Requirements of the Department of Defense Relating to Military Installations, as amended, with attached letters from the Director of Real Estate, Department of the Army, Office of the Chief of Engineers, dated November 14, 1973, November 23, 1973, and the Memorandum of Understanding between Alyeska Pipeline Service Company and U.S. Army Corps of Engineers. (This Exhibit B replaces, in its entirety, the original Exhibit B to the Federal Grant).
- (5) Exhibit C: Section 15 (Guaranty) as amended by January 2003 Record of Decision, Renewal of the Federal Right-of-Way for the Trans-Alaska Pipeline and Related Facilities.

F. Except as expressly amended in Subsection D and E above, all other current terms, covenants, and conditions of the existing Federal Grant, shall remain in full force and effect. As an additional requirement, to be incorporated in the Renewal as section 15.F, every three years the Authorized Officer shall conduct an audit of the financial resources of the Owner Entities, or other guarantors, that provide the Section 15 guaranties. If the Secretary determines by the audit that the Section 15 guaranties are inadequate, the Secretary may require additional financial assurances and guarantees.

G. This Renewal may be signed in counterpart. All such executed counterparts shall be considered an original, and the original signature pages may be attached to a single counterpart for purposes of recordation.

IN WITNESS WHEREOF, the parties have executed this Renewal and have agreed to its terms and conditions as of the date first above written.

UNITED STATES OF AMERICA

By: *Jale A. Norton*
Name: _____
Title: Secretary of the Interior

AMERADA HESS PIPELINE CORPORATION

By: *Margaret A. Yaege*
Name: MARGARET A. YAEGE
Title: President, Phillips Transportation Alaska, Inc. (see Note below)

Subscribed before me
on this 8th day of
January, 2003.

Mason Tsui

Mason Tsui
Notary Public District of Columbia
My Commission Expires April 30, 2005

BP PIPELINES (ALASKA) INC.

By: *Albert N. Belka*
Name: Albert N. Belka
Title: President

EXXONMOBIL PIPELINE COMPANY

By: *M. P. Tudor*
Name: MICHAEL P. TUDOR
Title: PRESIDENT


PHILLIPS TRANSPORTATION ALASKA, INC.

By: *Margaret A. Yaege*
Name: MARGARET A. YAEGE
Title: PRESIDENT

UNOCAL PIPELINE COMPANY

By: [Signature]
Name: Richard F. Lyson
Title: UNOCAL President

WILLIAMS ALASKA PIPELINE COMPANY, L.L.C.

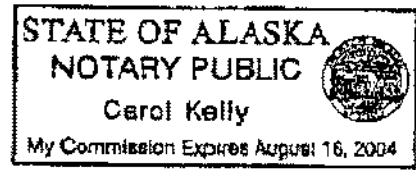
By: [Signature] 
Name: Michael Mewis
Title: Vice President

Note: Phillips Transportation Alaska, Inc. signs as successor to the TAPS ownership interest of Amerada Hess Pipeline Corporation as approved by and in accordance with the decision of the Authorized Officer dated January 23, 2003.

STATE OF Alaska
) ss.
Third Judicial District

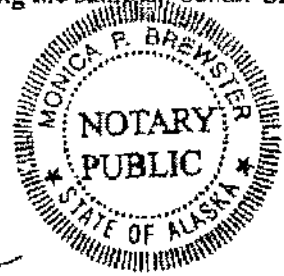
THIS IS TO CERTIFY that on this 5th day of FEBRUARY, 2003, before me appeared MARGARET A. YARBE, the PRESIDENT of Phillips Transportation Alaska, Inc., successor to the TAPS ownership interest of Amerada Hess Pipeline Corporation who executed the foregoing Renewal and acknowledged voluntarily signing the same on behalf of said corporation.

Carol Kelly
Notary Public in and for the State of
My Commission Expires:



STATE OF Alaska
) ss.
Third Judicial District

THIS IS TO CERTIFY that on this 5th day of February, 2003, before me appeared Albert N. Bulea, the President of BP Pipelines (Alaska) Inc. who executed the foregoing Renewal and acknowledged voluntarily signing the same on behalf of said corporation.



Monica P. Brewster
Notary Public in and for the State of
My Commission Expires:

My Commission Expires
November 9, 2004

STATE OF Texas
) ss.
County of Harris

THIS IS TO CERTIFY that on this 13th day of February, 2003, before me appeared Mike P. Tudor, the President of ExxonMobil Pipeline Company who executed the foregoing Renewal and acknowledged voluntarily signing the same on behalf of said corporation.



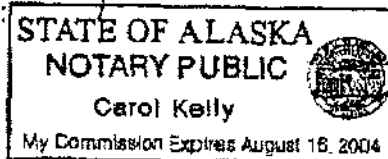
Laverne M. Ford
Notary Public in and for the State of
My Commission Expires:

STATE OF Alaska

Third Judicial District ss.

THIS IS TO CERTIFY that on this 5th day of FEBRUARY, 2003, before me appeared MARGARET A. HAESE, the PRESIDENT of Phillips Transportation Alaska, Inc. who executed the foregoing Renewal and acknowledged voluntarily signing the same on behalf of said corporation.

Carol Kelly
Notary Public in and for the State of
My Commission Expires:

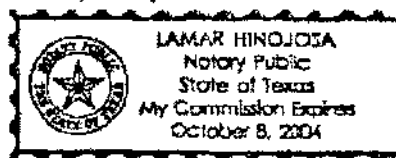


STATE OF Texas

Fact Bend County ss.

THIS IS TO CERTIFY that on this 13 day of February, 2003, before me appeared John F. Overton, the Vice President of Unocal Pipeline Company who executed the foregoing Renewal and acknowledged voluntarily signing the same on behalf of said corporation.

Lamar Hinojosa
Notary Public in and for the State of Texas
My Commission Expires: 10-8-04



STATE OF Oklahoma

County of Tulsa ss.

THIS IS TO CERTIFY that on this 10th day of February, 2003, before me appeared Michael Mears, the Vice President of Williams Alaska Pipeline Company, L.L.C. who executed the foregoing Renewal and acknowledged voluntarily signing the same on behalf of said corporation.

S. Denise Gibbins
Notary Public in and for the State of Oklahoma
My Commission Expires: 03-15-2005
My Commission No.: 01004553

